The International Journal of Management Education 21 (2023) 100893

Contents lists available at ScienceDirect

The International Journal of Management Education

journal homepage: www.elsevier.com/locate/ijme

# The change agent teaching model: Educating entrepreneurial leaders to help solve grand societal challenges

Frank J. van Rijnsoever [a,b,*], Silas Sitzler [a], Yvette Baggen [c]

[a] Copernicus Institute of Sustainable Development, Utrecht University, the Netherlands
[b] Centre for Academic Teaching and Learning, Utrecht University, the Netherlands
[c] Education and Learning Sciences, Wageningen University and Research, the Netherlands

ARTICLE INFO

*Keywords:*
Social entrepreneurship
Sustainable entrepreneurship
Sustainable leadership
Change agent
Teaching model

ABSTRACT

Higher education is increasingly expected to educate change agents who can help with solving grand societal challenges. Social and sustainable entrepreneurship (SSE) education and social and sustainable leadership (SSL) education provide promising directions to develop the education that prepares these students for their future roles. However, both educations are part of different research streams and have their respective pedagogical approaches. In this systematic literature review, we identify the differences and similarities between SSE and SSL education. We used the teaching model framework to map systematically the elements of the teaching and learning process. Our results show that the different streams share the aim of educating change agents in authentic, collaborative learning processes that are experiential in nature and challenge students to create value for others. However, SSE education focuses more on creating societal value, whereas SSL education captures the personal development of students. Based on the review, we present an overarching teaching model for educating change agents. Our teaching model can guide practitioners to design change agent education. It illustrates the urgency to change pedagogies fundamentally and how students, staff, and teaching infrastructures should be approached using such pedagogies to realize impactful change agent education.

## 1. Introduction

Higher education institutes have developed various educational approaches to accelerate the personal development of students, and simultaneously enable students to help solving the grand societal challenges (GSCs) of our time, such as climate change, threats to public health, and inequality across the globe (Figueiró & Raufflet, 2015; Pache & Chowdhury, 2012; Shriberg & MacDonald, 2013). Thereby, they educate *change agents*, which we define "as actors who exert their individual agency to innovate and create sustainable, accepted change in the systems in which they operate" (Vervoort et al., 2012, p. na). Prominent examples to educate change agents come from social entrepreneurship education (Pache & Chowdhury, 2012; Shahid & Alarifi, 2021) and sustainable entrepreneurship education (Lans et al., 2014; Sharma et al., 2020). We call this approach social and sustainable entrepreneurship (SSE) education. Other examples come from leadership education, such as the Social Change Model of Leadership (Astin, 1996; Watt, 2009), sustainable leadership education (Shriberg & MacDonald, 2013), and environmental leadership education (Vidra et al., 2019). In this paper, we refer to these concepts as social and sustainable leadership (SSL) education. In addition to transferring knowledge, the SSE and SSL

* Corresponding author. Princetonlaan 8a, 3584CB, Utrecht, the Netherlands.
*E-mail address:* f.j.vanrijnsoever@uu.nl (F.J. van Rijnsoever).

https://doi.org/10.1016/j.ijme.2023.100893
Received 28 February 2023; Received in revised form 25 September 2023; Accepted 29 October 2023
Available online 7 November 2023

research streams view other learning outcomes and processes as relevant to helping solve GSCs, such as through the acquisition of skills and mindsets (van Lunenburg et al., 2020) and personal development (Figueiró & Raufflet, 2015; Shriberg & MacDonald, 2013).

However, despite similar goals, the streams have their respective educational approaches. For example, leadership approaches focus strongly on personal development (Shriberg & MacDonald, 2013), whereas in entrepreneurship approaches, opportunity-seeking behavior and entrepreneurial learning in a complex institutional environment are key (Pache & Chowdhury, 2012). Such differences can lead to different forms of teaching and learning methods. However, the exact pedagogical commonalities and differences between SSE and SSL education remain unknown. This situation is undesirable as a comparison would allow us to highlight the strengths and underdeveloped aspects of each stream and facilitate cross-fertilization. Complementary insights from both can be brought together in a coherent overarching approach to educate change agents.

One way to systematically make these commonalities and differences visible is by articulating their teaching models, which describe the teaching and learning environment (Joyce et al., 2003). They capture the meanings of the educational approach, as well as the intended learning objectives, target audiences, contents, pedagogies, and assessment or evaluation methods (Fayolle & Gailly, 2008). Teaching models allow educators to connect the different aspects of the teaching process coherently (Béchard et al., 2005) and thus share these insights with a wider audience (Joyce et al., 2003). Teaching models are underutilized in higher education in terms of education related to change agents, such as teaching various forms of entrepreneurship (Fayolle & Gailly, 2008; Pittaway & Cope, 2007), and leadership (Shriberg & MacDonald, 2013). No systematic attempt has been made to formulate an overarching teaching model for change agent education. Such a model is direly needed to build scholarly evidence on which pedagogical approaches work and which do not.

We address this gap by conducting a systematic literature review where we compare the literature that describes the elements of teaching models in SSE and SSL education. We map each stream on the various elements of the teaching model. To this end, we pose the following research question: *What are the similarities and differences in teaching models between SSE and SSL education?* Next, we integrate the teaching models of each approach into a comprehensive teaching model for educating change agents in higher education.

We find that the grand aims of SSE and SSL education are similar. Moreover, both fields value experiential, student-centered learning processes. This similarity translates into many overlapping elements of the teaching models in SSE and SSL education, with each having its respective emphasis. SSE education focuses on societal value creation, whereas SSL education focuses on students' personal development. Our overarching teaching model is based on experiential learning and community engaged learning, which allows educators to combine the traditional educational goal to stimulate the personal development of students with the increasing societal demand to create societal value. Practitioners can use these insights to strengthen their educational approach and as a basis to develop new pedagogical approaches to educate change agents. We conclude by arguing that implementing change agent education fundamentally impacts how students, teachers, and higher education infrastructure should be approached.

In the remainder of this paper, we introduce our theoretical rationale and concepts in Section 2. Next, we discuss the methods used in our review in Section 3. Then, we compare the teaching model elements between SSE and SSL education in Section 4. We synthesize these findings into a teaching model for change agents in Section 5 and end with the concluding remarks.

## 2. Theoretical background

### 2.1. The changing role of higher education to help solving GSCs

Since the early 21st century, considerable attention was paid to how higher education can contribute to GSCs (Andruk & Altinay, 2022; Bayuo et al., 2020; Chankseliani & McCowan, 2021; Compagnucci & Spigarelli, 2020; Trencher et al., 2014). These challenges are described by frameworks such as the Sustainable Development Goals (Sachs, 2012; The United Nations, 2017). GSCs are *complex* as they are dynamic and value-laden (Voegtlin et al., 2022). Solving GSCs requires navigating the interests of new and incumbent stakeholders (Hekkert et al., 2020; van Rijnsoever & Leendertse, 2020) while combining insights from the natural sciences, social sciences, and humanities. Furthermore, due to this complexity GSCs are *uncertain* as their future state is difficult (if not impossible) to predict. Additionally, the importance of GSCs is difficult to predict because of the (changing) stakes and problem perceptions of the actors involved. GSCs are *value-laden* because they are evaluative. The interpretation and perceived significance of GSCs can be experienced differently by different actors, depending on one's worldview.

### 2.2. Change agents in GSCs

Dealing with GSCs requires actors to have the values, knowledge, and skills to navigate and intervene in the complex, uncertain and value-laden landscape where these problems take place (OECD, 2018; van Stijn et al., 2018). We refer to these actors as "Change agents", which is a neutral term, covering leadership and entrepreneurial initiatives for help solving GSCs.[1] The term change agent has received many related definitions (Ottaway, 1983). We follow Vervoort et al. (2012, p. na) and define change agents as "actors who exert their individual agency to innovate and create sustainable, accepted change in the systems in which they operate." This definition originates from the literature on institutional entrepreneurship (Maguire et al., 2004) and was extended to fit the context of GSCs.

[1] The literature uses different terms to describe individuals who engage in societal change processes. Commonly used terms are (1) *change agent*, (2) *change leader*, and (3) *change maker*. Each concept has a disciplinary history with a diverse set of definitions, interpretations, and actual realizations (Ottaway, 1983; Zamora & Sánchez-Martín, 2019; Drucker, 2000).

Change agents consciously contribute to solving GSCs often incrementally, but sometimes in a radical way. They often do so by founding or participating in responsible enterprises (either social or sustainable), social movements, activism (Santos, 2012), changing existing organizations from within via intrapreneurship (Kistruck & Beamish, 2010), or by engaging in processes of institutional change (Jolly et al., 2016; Wijen & Ansari, 2007). Leadership and entrepreneurship education can empower students to become change agents.

### 2.3. Entrepreneurship and leadership in change agent education

The literature that we review stems either from an entrepreneurship or a leadership tradition. Entrepreneurship is traditionally defined *"as the recognition and exploitation of opportunities that result in the creation of a firm that seeks to obtain entrepreneurial rents"* (Alvarez & Busenitz, 2001, pp. 756–757). This definition does not consider creating value for society or the environment, which is captured by various related subdomains in the entrepreneurship literature (Tiba et al., 2018), such as social entrepreneurship (Saebi et al., 2019; Santos, 2012) and sustainable entrepreneurship (Johnson & Schaltegger, 2020). These approaches to entrepreneurship found their way to higher education (Pache & Chowdhury, 2012) in which entrepreneurial skills and mindsets are adopted to empower students addressing GSCs (Baggen & Kaffka, 2022). Entrepreneurial skills and the entrepreneurial mindset enable individuals to deal with uncertainty, be resilient, and solve problems in collaborative, iterative, and creative processes of value creation. Particularly, the experiential nature of education *through* entrepreneurship can prepare students for their role as change agents (Baggen & Kaffka, 2022; Lackéus, 2020). In this regard, authors also refer to the difference between entrepreneurship pedagogies and enterprising pedagogies (Jones & Iredale, 2010). In entrepreneurship education students are prepared to start their own business. In enterprising education students develop skills and mindsets that are useful for contributing to solve GSCs. Students learn to create value for others by actively participating in the uncertain, entrepreneurial process, resulting in rich learning journeys full of learning surprises (Baggen et al., 2021; Scardamalia et al., 2012).

Leadership can be defined as "a process whereby an individual influences a group of individuals to achieve common goals" (Northouse, 2019, p. 43). Although leadership has many forms, the idea of change agents relates to transformational leadership (Bass, 1990). The intrinsic motivation and innovative solutions that result from transformational leadership can contribute to solving GSCs. Being a transformational leader enables change agents to inspire a team to reach a shared common goal and work beyond self-interest, by balancing between the variety in disciplines, perspectives, and interests of stakeholders that make the problem complex. This is critical to gain and keep trust from all who are involved. However, the great complexity is also what makes transformational leadership for GSCs more difficult than when applied to a single organization. Therefore, transformational leadership is a starting point, though it must be extended by other forms of leadership to address GSCs (Shriberg & MacDonald, 2013). Research has shown that transformational leadership can be trained (Brown & May 2012; Kelloway et al., 2000). For example, group training and individual feedback on leadership have been shown to be effective teaching methods (Barling et al., 1996; Kelloway et al., 2000). For change agents, the context of these teaching methods needs to be applied to GSCs.

SSE and SSL each originate from their own research traditions, teaching approaches and perspectives, but are related. Litzky et al. (2010) argue: "[s]ocial entrepreneurship fuses transformational leadership with the entrepreneurial spirit with the intention of creating community-minded accountable and responsible citizens" (p.146). Also of academia, the important link between leadership and entrepreneurship has received attention. For example, the importance of transformational leadership in social entrepreneurship has been studied in the context of social non-profit organizations (Felício et al., 2013) and the role of culturally endorsed transformative leadership for social entrepreneurship has been studied from a macro-level, international perspective (Muralidharan & Pathak, 2018).

### 2.4. Social and sustainability connotations in entrepreneurship and leadership education

In this paper, we focus on entrepreneurship and leadership education that share social and sustainable connotations. The connotation of "social" refers to problems related to the well-being of people, communities, or societies, whereas "sustainable" extends this circle to environmental problems and the value of nature. Both connotations are strongly related and aim to create public value (Johnson & Schaltegger, 2020; Shriberg & MacDonald, 2013; Tiba et al., 2018). Addressing GSCs often requires integrating the social and environmental dimensions (Muñoz et al., 2018), which could be an argument for limiting our review to the sustainability connotation. Nevertheless, we include the social connotation as social aspects form an important foundation for sustainability-oriented approaches (Amatucci et al., 2013).

### 2.5. Teaching models for change agents

We compare SSE and SSL education in terms of the underlying teaching model. Teaching models describe the teaching and learning environments (Joyce et al., 2003). Codifying teaching models helps to create constructively aligned education programs, that is, teaching methods and assessments align with the level and context of the learning objectives (Biggs, 1996). Furthermore, they allow for sharing these insights with a wider audience, thereby facilitating learning and the development or improvement of teaching models (Joyce et al., 2003).

We depart from the teaching model framework for entrepreneurship education as proposed by Fayolle and Gailly (2008). Although this model (Fig. 1) is derived from the general literature on teaching models (Joyce et al., 2003), it focuses on education to take initiative. Thereby, it allows systematically encompassing the requirements for change agent education. The teaching model

framework has been applied by different scholars (see Hägg & Gabrielsson, 2020; Nabi et al., 2017) to reach a deeper understanding of the impact and pedagogy of entrepreneurship education.

The teaching model has two levels: the ontological and educational level. In this paper, the ontological level relates to the grand aim of change agent education as a teaching field and the learning approach used to develop such change education.[2] For instance, the grand aim could be to educate innovative change agents via experiential, real-world learning approaches. Together, the grand aim and learning approaches inform the dimensions at the educational level. At the educational level, the "for whom" question relates to the target group of education programs. In the current study, these are students in higher education. The "why" question provides insights into the specific objectives and learning goals of education programs and courses. The "what" question elaborates on the content of education, including conceptual knowledge, skills, and mindsets. The "how" question discussed the teaching methods that are applied in education programs, such as lectures, field trips, and pitches. The "for which results" question relates to assessing whether the students achieved the learning goals and how the education is evaluated.

## 3. Methods

To answer our research question, we conducted a qualitative systematic literature review (Grant & Booth, 2009), in which we compare and integrate qualitative insights from studies on SSE and SSL education. Empirically, we followed Mayring's (2000) four steps: material collection, descriptive analysis of the material, selection of the main conceptual categories, and evaluation of the material pertaining to these categories.

### *3.1. Material collection*

As source material, we used scientific journal articles. We chose this source material, because it provides an international representation of educational practices, has undergone quality control through peer review, and its use increases the reproducibility of our results, as everyone can repeat the material collection process. We collected our material from the Scopus database of Elsevier, which is one of the major databases containing scientific literature. To minimize the chances of missing relevant articles, we decided to cast a "wide net." Accordingly, we applied an iteratively composed broad search query to obtain numerous potentially relevant papers. Our search queries consist of three parts: (1) literature-specific keywords, (2) commonly used terms for teaching model elements in all streams, and (3) limitation of the period and type of document. We included all published empirical articles and reviews between 2000 and 2022. Table 1 presents the final search queries.

The queries returned 2463 and 608 potentially relevant articles for SSE and SSL education, respectively. We initially discarded false positives based on the title, abstract, and, in case of doubt, a first scan of the body of the article. Then, these articles were scrutinized in depth prior to and during the analysis phase. As a result, a final sample of 65 SSE articles and 18 SSL articles was obtained. The exclusion criteria for the articles are as follows:

1. Studies were not on higher education.
2. Studies on leadership and entrepreneurship of higher education management (e.g., staff training and mission statements)
3. Studies on leadership or entrepreneurship education, but missing a clear link to the social or sustainability dimension
4. Studies based on social or sustainability education, but missing a clear link to leadership or entrepreneurship
5. Studies that did not discuss the elements of the teaching model framework
6. Studies that were not obtainable for the authors, for example, because they were behind a paywall for both universities with which the authors were affiliated.

We discarded most articles because they did not deal with SSE or SSL education or did not discuss the elements of the teaching model framework. For example, we found many articles that predicted the entrepreneurial intention of students but were unclear about the teaching model underlying the education. The share of articles that were retained after both selection rounds is approximately the same in both streams (SSE: 2.6% and SSL: 3.0%).

### *3.2. Descriptive analysis of the material*

In the first decade of our evaluation period, a comparable number of articles were published in both streams. However, during the last decade, the number of SSE articles increased, particularly in the last five years of the period under investigation (Fig. 2), whereas that of SSL articles remains relatively constant. This finding suggests that the SSE literature is maturing more rapidly than the SSL literature. A possible reason for the differences between the two streams is that much of the SSE literature is driven by business school related literature, while SSL does not have a strong disciplinary base (see 4.2.1). In business schools SSE has also recently taken of as a research topic, which will likely translate into education. The most prominent SSE journals are the *Academy of Management Learning and Education* (7 articles), *Sustainability* (6 articles), *The International Journal of Management Education* (5 articles), and *Entrepreneurship Education and Pedagogy* (4 articles). Most SSE articles (68%) were published either in business, management, or entrepreneurship

[2] We summarized the more elaborate questions at the ontological level by Fayolle and Gailly (2008) as grand aims of and learning approaches. Thereby, we slightly adapted their teaching model for entrepreneurship education.

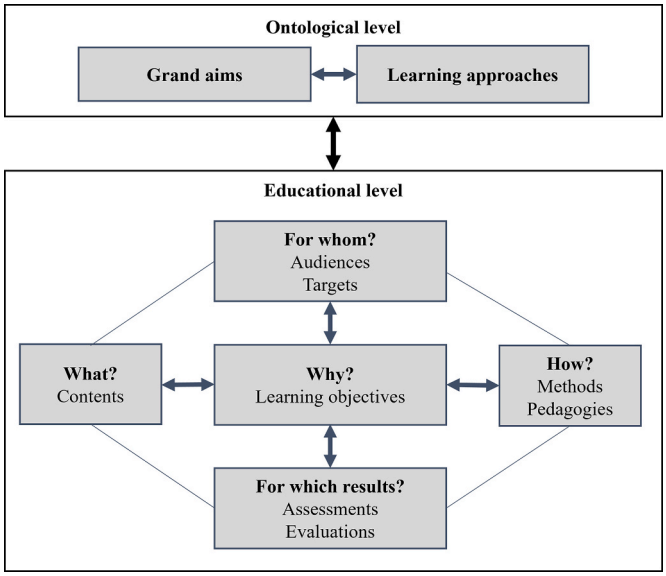


**Fig. 1.** Teaching model framework, adapted from Fayolle and Gailly (2008).

**Table 1**
Search queries and results.

| Topic | Search query | Articles from the search query | Articles after the selection |
|---|---|---|---|
| Social and sustainable entrepreneurship (SSE) | TITLE-ABS-KEY ("Social* Entrepreneur*" OR {Social Entrepreneurship Education} OR "Sustainab* Entrepreneurship Education" OR "Sustainab* Entrepreneur*" OR "Environmental* Entrepreneur*" OR "Environmental Entrepreneurship Education" OR "Eco* Entrepreneur*" OR {Ecological Entrepreneurship Education} AND "skill*" OR "competenc*" OR "value*" OR "pedagog*" OR "training" OR "educ*" OR "program*" OR "design*" OR "teaching" OR "course" OR "didactic*" OR "universi*") AND (PUBYEAR > 1999) AND (PUBYEAR < 2023) AND (LIMIT-TO (DOCTYPE, "ar") OR LIMIT-TO (DOCTYPE, "re")) | 2463 | 65 |
| Social and sustainable leadership (SSL) | TITLE-ABS-KEY ({Leadership of Change} OR {Social Change Model of Leadership} OR { Social Change Leadership} OR {Social Change Model of Leadership Education} OR {Social Change Leadership Education} OR { Social Change Leader} OR {Socially responsible Leader} OR {Social Responsibility Leadership Education} OR "Sustainab* Leader*" OR {Sustainable Leadership Education} OR "Environment* Leader*" OR {Environmental Leadership Education} OR "Eco* Leader*" OR {Ecological Leadership Education} AND "skill*" OR "competenc*" OR "value*" OR "pedagog*" OR "training" OR "educ*" OR "program*" OR "design*" OR "teaching" OR "course" OR "didactic*" OR "universi*") AND (PUBYEAR > 1999) AND (PUBYEAR < 2023) AND (LIMIT-TO (DOCTYPE, "ar") OR LIMIT-TO (DOCTYPE, "re") | 608 | 18 |

journals, sustainability-oriented journals, or journals that combine both, which supports the argument that SSE is driven by business school related literature. Many of these journals are specifically dedicated to education. The most prominent SSL journals are the *New Directions for Student Leadership* (4 articles) and the *Journal of Environmental Studies and Sciences* (2 articles). All other journals have published one SSL article. These numbers are relatively small to identify a real trend, though approximately 67% are from journals related to leadership, sustainability, or a combination thereof. In contrast to SSE, SSL has not yet developed a strong research base. As SSE appears to be more mature at the moment, we can expect that the SSE stream yields more codes than the SSL stream, allowing for a more detailed picture of the education model offered. However, this is not problematic as both streams are relatively separate but share similar aims, and can therefore inspire one another.

### *3.3. Selection of the main conceptual categories and material evaluation*

The main conceptual categories are based on the elements of Fayolle and Gailly's (2008) teaching model framework.

For each of the seven categories, we started open coding by identifying text passages that represent an element of the teaching model using the guiding questions from Table 2. During the iterative analysis, we created higher-order categories for similar codes (see Gioia et al., 2012). We counted the frequency for which each of the categories appeared in each literature stream.

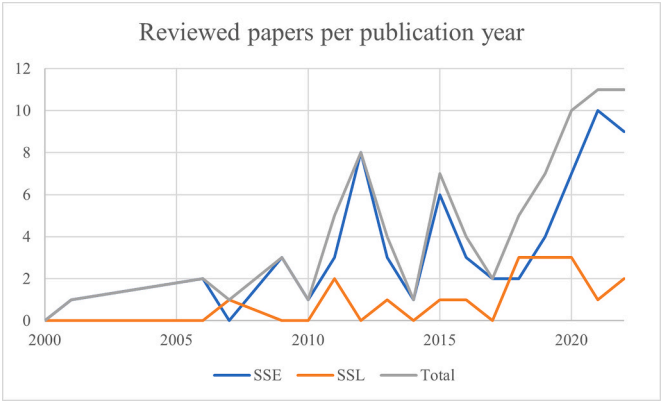


**Fig. 2.** Reviewed articles per publication year
Note: SSE: social and sustainable entrepreneurship, SSL: social and sustainable leadership.

## 4. Results

Table 3 summarizes the results of our review. We discuss each category and its prominence in each stream. When a specific article provides an interesting additional viewpoint, we mention that as well. For each code, we report the percentage of articles that mentioned it in a literature stream. This step helped us to identify the dominant narratives in each stream. We found that the majority of the articles in both streams focus on aspects of the ontological level (SSE; 95.4%; SSL: 94.4%). The educational level receives attention in 100% of all the articles on both streams. However, these articles significantly differ in what elements of the teaching model are discussed.

### *4.1. Ontological level*

#### *4.1.1. Overall aims*

The overall aims of the education receive attention in 70.8% and 88.9% of the SSE and SSL articles, respectively. Table 3 shows two main categories of overall aims, which differ in their emphasis between the two streams.

Creating value for society is an educational aim in 46.2% of the SSE articles. In most instances, this aim refers to the creation of social or environmental value to society via education, such as helping underprivileged groups. Other types of value are economically oriented, such as system building, economic growth, the creation of jobs or innovation (see Kim et al., 2020), and the discovery of new sustainable business models (Chang et al., 2014). In SSL, 27.8% of the articles discuss societal value creation as their aim. Two SSL articles refer to the creation of social or environmental value during the education process, and four SSL articles discussed creating other forms of value for society, such as community engagement (Vidra et al., 2019).

In SSE, students' personal development is mentioned in 38.5% of the articles. This development often pertained to becoming an entrepreneur or a change agent, for example, by preparing students to identify business opportunities, or shaping their entrepreneurial mindset, educating globally engaged citizens, and increasing employability (Rivers et al., 2015). In SSL articles, 77.8% focus on generic personal development. The majority discusses the preparation of future leaders or agents of change. Another theme was creating socially responsible or critical citizens (Kark et al., 2016).

Based on our examination of the overall aims, we conclude that societal value creation through education is more prominent in SSE than in SSL articles. In contrast, the SSL stream focuses more on personal development than the SSE stream.

#### *4.1.2. Learning approaches*

Table 3 shows that learning approaches have somewhat fewer discussions in SSE articles (73.8%) than in SSL articles (88.9%). We

**Table 2**
Operationalization of the teaching model elements.

| Level | Teaching model element | Guiding question(s) |
|---|---|---|
| Ontological level | Overarching aim | What are the overarching aims of the education program? |
| | Learning approach | What learning theories or models are used in the education program? |
| Educational level | For whom? (target audiences) | What types of students participate in the education process in terms of discipline? |
| | Why? (objectives, goals) | What competencies, skills, and/or mindsets should the students develop? |
| | What? (concepts, skills) | What concepts or skills are covered by the education program? |
| | How? (methods, pedagogies) | What kinds of learning activities does the education program include? |
| | For which results? (assessments, evaluations) | What kinds of assessments are used to evaluate student performance? |
| | | How is the education evaluated? |

**Table 3**
Summary of the prevalence of categories as percentages of articles in each stream.

| Level | Total (%) | SSE (%) | SSL (%) | Teaching model element | Total (%) | SSE (%) | SSL (%) | Category of codes | Total (%) | SSE (%) | SSL (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ontological level | 95.2 | 95.4 | 94.4 | Overarching aim | 74.4 | 70.8 | 88.9 | Creating value for society | 42.2 | 46.2 | 27.8 |
| | | | | | | | | Personal development of students | 47.0 | 38.5 | 77.8 |
| | | | | Learning approach | 77.1 | 73.8 | 88.9 | Experiential learning | 45.8 | 49.2 | 33.3 |
| | | | | | | | | Community-engaged learning | 22.9 | 21.5 | 27.8 |
| | | | | | | | | Approaches that emphasize personal development | 18.1 | 9.2 | 50.0 |
| | | | | | | | | Critical pedagogies | 3.6 | 3.1 | 5.6 |
| Educational level | 100.0 | 100.0 | 100.0 | For whom? (target audiences) | 72.3 | 75.4 | 61.1 | Institute-wide | 49.4 | 52.3 | 38.9 |
| | | | | | | | | Business school | 25.3 | 32.2 | 0.0 |
| | | | | | | | | Sustainability science | 6.0 | 4.6 | 11.6 |
| | | | | Why? (objectives, goals) | 67.5 | 70.8 | 55.6 | Understanding and applying conceptual knowledge | 50.6 | 53.8 | 38.9 |
| | | | | | | | | Acquiring practical skills | 49.4 | 50.8 | 44.4 |
| | | | | | | | | Reflection on the learning process | 8.4 | 6.2 | 16.4 |
| | | | | What? (concepts, skills) | 83.1 | 87.7 | 66.7 | Business, entrepreneurship, and leadership knowledge | 45.8 | 52.3 | 22.2 |
| | | | | | | | | Social or sustainability project knowledge | 39.8 | 49.2 | 5.6 |
| | | | | | | | | Knowledge about social or sustainability issues | 47.0 | 50.8 | 33.3 |
| | | | | | | | | Interpretation skills | 50.6 | 49.2 | 55.6 |
| | | | | | | | | Project-related skills | 53.0 | 55.4 | 44.4 |
| | | | | | | | | Academic skills | 9.6 | 9.2 | 11.1 |
| | | | | How? (methods, pedagogies) | 80.7 | 81.5 | 77.8 | Passive learning | 37.2 | 40.0 | 27.8 |
| | | | | | | | | In-house projects | 43.4 | 46.2 | 33.3 |
| | | | | | | | | Field-based projects | 62.7 | 63.1 | 61.1 |
| | | | | | | | | Discussion and reflection | 45.8 | 41.5 | 61.1 |
| | | | | For which results? | 56.6 | 60.0 | 44.6 | Formal exams | 4.8 | 6.2 | 0.0 |
| | | | | | | | | Written products | 33.7 | 35.4 | 27.8 |
| | | | | | | | | Non-written products | 10.8 | 9.2 | 16.2 |
| | | | | | | | | Observation-based assessment | 6.0 | 4.6 | 11.1 |
| | | | | | | | | Dialogue-based assessment | 7.2 | 6.2 | 11.1 |
| | | | | | | | | Evaluations | 34.9 | 35.4 | 33.4 |

Notes: SSE: social and sustainable entrepreneurship, SSL: social and sustainable leadership.

identified four categories of learning approaches. The differences in aims fit with the learning approaches underlying the education programs.

SSE articles largely focus on experiential learning approaches (49.2%) or variations thereof, such as challenge-based learning, learning-by-doing, and action learning (see Awaysheh & Bonfiglio, 2017; Souto & Rodriguez-Lopez, 2021). In addition, 21.5% of the SSE articles rely on community-engaged learning approaches or variations thereof, such as service learning. Both categories of learning approaches are related and value interaction, authenticity, and reflection as part of the learning process. A noteworthy addition is made by Addae and Ellenwood (2022), who argue that integrating the study of theoretical concepts into experiential and community-engaged learning activities is important in education to develop fully the social entrepreneurship competencies of students. Another addition is that students need to reflect on and increase their awareness of their learning process and needs (Pischetola & Martins, 2021).

Both categories are also dominant in the SSL stream. However, SLL emphasizes community-engaged learning (27.8%) more than SSE, and has less focus on experiential learning (33.3%). The main philosophy in SSL is that field experiences boost students' personal development, such as their leadership skills. Again, reflection moments can accelerate the learning processes underlying leadership skill development (Kaufman & Stedman, 2022).

Only 9.2% of the SSE articles mention learning approaches that relate to personal development. An interesting approach is developing identities because it argues that professional identity can help turn ideas into action. Moreover, the self-efficacy of students, namely, the confidence in their ability to effect positive social change in real life, is valued in SSE (Fernhaber, 2022; Smith & Woodworth, 2012). In contrast, various learning approaches that emphasize personal development are dominant in SSL (50.0%). The most common approach is the Social Change Model of Leadership (Astin, 1996), which emphasizes that students need to learn, reflect on, and practice a set of interrelated values at the personal, group, and community levels to become leaders of change.

Other noteworthy learning approaches were different critical pedagogical approaches (SSE: 3.1%, SSL: 5.6%), such as feminism

(Kark et al., 2016) and dark side theory (Talmage & Gassert, 2022) that challenges business-oriented stances to change agent education. However, with only three articles, such approaches are rare.

Based on the above, we conclude that although SSE and SSL have rather different foci, at the core, they apply similar learning approaches. Both value experiential, authentic, and reflective learning processes in education. However, SSL has more articulated personal development approaches, whereas SSE focuses more on the action-oriented process of value creation.

### 4.2. Educational level

#### 4.2.1. For who? (Target audience)

In our methods, we limited the papers in this review to higher education. Within this context, 75.4% and 61.1% of the SSE and SSL articles coded their target audience, respectively. We coded the target groups by discipline, if any.

Of the SSE articles, 52.3% discussed that they targeted students from an entire higher education institute regardless of discipline, although these students were often already engaged in entrepreneurship or social/sustainable projects. The most prominent disciplinary target group in SSE is business school students (32.2%). Other notable target groups are sustainability sciences and nursing students. For SSL, 38.9% of the articles focused on an entire institute. We did not find an SSL article that focused on business school students only. The most notable discipline within SSL was sustainability sciences, with two articles (11.6%).

We conclude that both approaches are applicable to all students. Furthermore, SSE strongly targets business school students. In contrast, SSL does not have a strong disciplinary target group, though it has not covered business schools thus far.

#### 4.2.2. Why (objectives, goals)

Following the constructive alignment idea, the general aims and pedagogical principles should be translated into matching learning goals. We found that SSE articles are more explicit in formulating learning goals (70.8%) than SSL articles (55.6%). We identified three categories of learning goals.

First, understanding and applying conceptual knowledge is present in 53.8% of the SSE articles. As is to be expected, the first prominent learning goal is to understand the principles of social/sustainable entrepreneurship or innovation. This goal covers the theoretical underpinnings of conducting business and innovation management, identifying the factors that enable social/sustainable businesses or innovations, and operating in various institutional environments (Pache & Chowdhury, 2012). The second important learning goal is to identify and evaluate societal problems and solutions. Other goals are to learn to view the world through an ethical lens and reflect on different approaches to solving societal problems. Both can help with accomplishing the first and second learning goals. SSL articles describe understanding and applying conceptual knowledge goals in 38.9% of all instances. Most goals that we identified are similar to SSE. As can be expected, the most important SSL goal is to understand the principles of leadership. However, this goal is absent in SSE. In a similar vein, we did not find any SSL articles that describe understanding the principles of social/-sustainable entrepreneurship or innovation as a learning goal. This is a prominent area where both streams are divided.

Second, the goal of acquiring practical skills helps to apply acquired theoretical knowledge, which is coded in 50.8% of the SSE articles. The most prominent example in SSE is to acquire entrepreneurial skills, competences, and attitudes to learn to create social/sustainable enterprises and projects and operate socially or sustainably. Specific examples of needed skills mentioned in SSE and SSL are business/project planning skills, collaboration skills, and presentation and communication. Overall, the SSL articles focus less on creating solutions or businesses than SSE. For example, no SSL articles refer to creating social/sustainable projects (versus eight SSE articles). The difference in orientation is in line with the ontological aims of each stream.

The final category is about reflection on the learning process and personal development. Reflecting on their learning process can help students understand their strong and weak points and help them improve their development. Reflection on the learning process and personal development was identified in 6.2% and 16.3% of the SSE and SSL articles, respectively. This finding fits with the ontological principles of SSL.

Overall, we found that the learning goals we identified are congruent with the ontological aims of both approaches, where SSE focuses more on knowledge and skills to solve societal problems, and SSL focuses more on personal development.

#### 4.2.3. What? (Contents and skills)

The content of the education is relatively well discussed in both streams (SSE: 87.7%, SSL: 66.7%). In line with the learning goals, we made a distinction between conceptual knowledge and skills and motivations. For conceptual knowledge, we identified three main categories. Further, we discuss skills and mindset jointly as the differences between these two terms are difficult to discern. For example, whether an article referred to shaping a critical mindset or critical thinking skills is often unclear.

First, conceptual knowledge about business, entrepreneurship, and leadership is found in 52.3% of the SSE articles. The first prominent code is entrepreneurship theories and tools, which include topics such as the fundamentals of starting a business and acquiring or mobilizing resources, such as capital. It also covers related tools, such as the business model canvas or the SWOT analysis (strengths, weaknesses, opportunities, and threats). The second code is business and economics knowledge, which includes knowledge about economics, accounting, marketing, research methods, and strategic management, such as the resource-based view. The third code is knowledge about leadership, which covers topics such as leading a corporate venture, leading a social venture, management, and leadership development. Of the SSL articles, 22.2% pay attention to business, entrepreneurship, and leadership knowledge. This attention exclusively focuses on leadership in the context of personal development and values, such as the SCM. Surprisingly, we found no SSL articles that described knowledge about leading or managing organizations. This is in line with the focus of SSL on personal development.

Second, conceptual knowledge social and sustainability projects is more strongly present in SSE (49.2%) than in SSL (5.6%: 1 article). The majority of these SSE articles pay attention to organizing social/sustainable entrepreneurship projects, which encompasses theories, principles, and tools that students need to acquire to initiate the project or innovation. Examples are ideas about social, ecological, and sustainable venturing, principles of philanthropy, impact investing, social return on investments, social business model canvas, stakeholder management, and green marketing. Another topic is theories about societal change, which focus on societal change processes, rather than the role of the individual in those processes. The topic covers theories such as institutional theory/activism, grassroots initiatives, social missions, socio-technological change, and feminist theories. A third topic is about societal impact and includes indicators and measurement models of societal change. The only SSL article that addresses this category is Kark et al. (2016), which could also be seen as part of the SSE stream as it discusses social change enterprises.

The third category is conceptual knowledge about social or sustainability issues, which was coded in 50.8% of the SSE articles. It contains knowledge about social and other sustainability-related topics, which are equally prominent in SSE. Examples are social inequality or loss of biodiversity. The category also contains knowledge about integrity and ethics, which is less prominent in SSE. In SSL, we found that in this category, 33.3% of the articles focus mostly on social issues and systems thinking. The other topics each receive attention in one article.

The first category of skills and mindsets are interpretation skills, which refer to mental skills that can be used to analyze and interpret a situation. Half of the SSE articles (49.2%) refer to these skills. Numerous skills come back in many SSE articles, such as reflection, critical thinking, empathy, and ethical thinking. Interpretation skills are discussed in 55.6% of the SSL articles. SSL puts greater emphasis on critical thinking and reflection skills than SSE, whereas empathy is equally important in both streams. Moreover, responsible citizenship and interdisciplinary thinking are more important in SSL than in SSE. Responsible citizenship was not found in SSE, whereas only one SSE article discusses interdisciplinary thinking.

Second, project-related skills refer to skills necessary for devising or executing a project. In SSE, 55.4% of the articles pay attention to this category. Common skills include problem-solving skills (such as formulating strategies or consulting), creativity, collaboration skills, communication skills, project management skills (such as planning or budgeting), identifying opportunities, and networking with external parties. SSL focuses on project-related skills in 44.4% of the articles. Common skills are problem-solving, communication, collaboration, and project management skills. SSL pays comparatively less attention to networking with external parties and creative thinking than SSE.

Finally, both streams refer to generic academic reading and writing skills as part of their education (SSE: 9.2%; SSL: 11.1%), indicating that both streams combine academia with making a social impact.

Overall, we conclude that the streams mainly differ in the conceptual knowledge each offers. SSE focuses on knowledge to develop projects and solutions with impact, which is in line with the overall aims and learning goals of the stream. SSL focuses on personal development and less on creating societal value. In addition, a possible reason that SSL is less specific than SSE about understanding social or sustainability issues is the more diverse disciplinary base of students in SSL. This knowledge is expected to be covered in the respective study programs of the different students. Regarding skills, both streams are relatively similar.

#### *4.2.4. How? (Methods, pedagogies)*

Both streams discuss the teaching methods and pedagogies well (SSE: 81.5%, SSL: 77.8%). Table 3 shows four broad categories.

Passive (or traditional) learning refers to teaching methods where students receive information from an instructor and need to internalize it (Michel et al., 2009). Classical examples are lectures and reading materials. In the context of change agents, passive learning can help to build a conceptual base that students can use in applied settings in the future (Addae & Ellenwood, 2022). Passive learning is mentioned more often in SSE (40.0%) than in SSL (27.8%).

In-house projects refers to teaching methods where students are tasked to think creatively or actively develop new materials or ideas within the confines of their school. These teaching methods were found in 46.2% of the SSE articles. Examples are business plan competitions, desk research projects on societal problems, analyzing companies (through desk research), and a hackathon (see Pizarro & Graybeal, 2022). In SSL, 33.3% of the articles describe in-house projects. Examples are drafting a position paper or working on hypothetical solutions to societal problems.

Field-based projects refers to when students are tasked to think creatively or actively develop new material together with societal stakeholders. Both streams used this category to an equal degree (SSE: 63.1%, SSL: 61.1%). Moreover, of all the teaching methods, this category is the most mentioned in both streams. This finding fits the emphasis on activating and field-oriented approaches at the ontological level, such as experiential learning and community engaged learning. Prominent methods are consultancy projects with clients and social partners and setting up or assisting in social or sustainability projects and internships. Less engaged methods in this category include conducting site visits, presenting or pitching to stakeholders, and interviewing societal stakeholders and entrepreneurs.

Discussion and reflection mostly take place within the boundaries of the school. It entails teaching methods that help students to reflect on their personal development, learning process, interaction with others, and learning materials. This method is often done via discussion with peers, coaches, or mentors. SSL articles mention discussion and reflection methods more often than SSE articles (SSE: 41.5% vs. SSL: 61.1%). Example methods are interactive seminars on a certain topic, debates, reflection on the progression of projects, personality tests, individual or group coaching of students regarding personal or professional development, and workshops with similar aims. Less conventional approaches include discussing religious parables to promote ethical reflection in social entrepreneurship (Toledano, 2020) and using meditation and contemplation to enhance self-reflection (Komives et al., 2020).

Overall, we found that both approaches use all four categories in their teaching approach. Field-based projects is the preferred method of both streams. SSE complements this finding with an emphasis on passive learning and in-house projects. The activities in in-

house projects fit with the aim of the SSE stream to develop innovative solutions to societal problems. In contrast, the stronger emphasis on discussion and reflection is in line with the ontological aim of SSL to focus on students' personal development.

#### 4.2.5. For which results

This teaching model element captures how the student is assessed relative to the learning goals and how the quality of education is evaluated. This teaching model element was the least frequently coded (SSE: 60.0%, SSL: 44.4%). We identified five categories of student assessment.

Formal exams are rarely reported on and were only found in the SSE stream (6.2%). Additionally, they do not necessarily fit with the aims and learning theories of both streams, though they can be used to assess the mastery of the needed conceptual knowledge (Addae & Ellenwood, 2022). This category is possibly underreported in scientific articles as it is not a novel assessment method.

Written products are the most used assessment method in both streams (SSE: 35.4%, SSL: 27.8%). They consist of reports about a specific topic, such as a societal problem, a company, or a business plan. Another form that we commonly observed is reflection reports on the personal development of project progress. SSE tends to rely more on reports on a specific topic, whereas SSL tends to rely on reflection reports.

Non-written products consist of oral presentations, pitches, and multimedia products, such as videos, podcasts, websites, and prototype products. This category may be also underrepresented as only 9.2% of the SSE articles and 16.2% of the SSL articles mention this category. However, this category may contain valuable assessment tools for educational contexts where new ideas and solutions are developed.

In observation-based assessment, instructors, stakeholders, and other involved individuals base their assessment on observing students' behavior. Examples are active class participation and observation of students during an internship or while interacting with societal partners. This category is also rare, only 4.6% and 11.1% of the SSE and SSL articles mention it. However, this category can be useful when assessing students in the field or their behavior in groups.

In dialogue-based assessment, the student and assessor come to an assessment during or after a dialogue. Examples include exit interviews, dialogues with faculty or stakeholders, peer evaluation, or self-assessment in a dialogue. Dialogue-based assessment is also rare, with only two articles that mention it (Andruk & Altinay, 2022; Tugas, 2019) (SSE: 6.2%, SSL: 11.1%). Nevertheless, this assessment method can be valuable when the learning process is part of it, which can be the case for personal development. Moreover, dialogue-based assessment also allows students and the assessor to provide context to events or products.

Overall, we observe that written products are the most commonly used form of assessment, though promising alternatives are

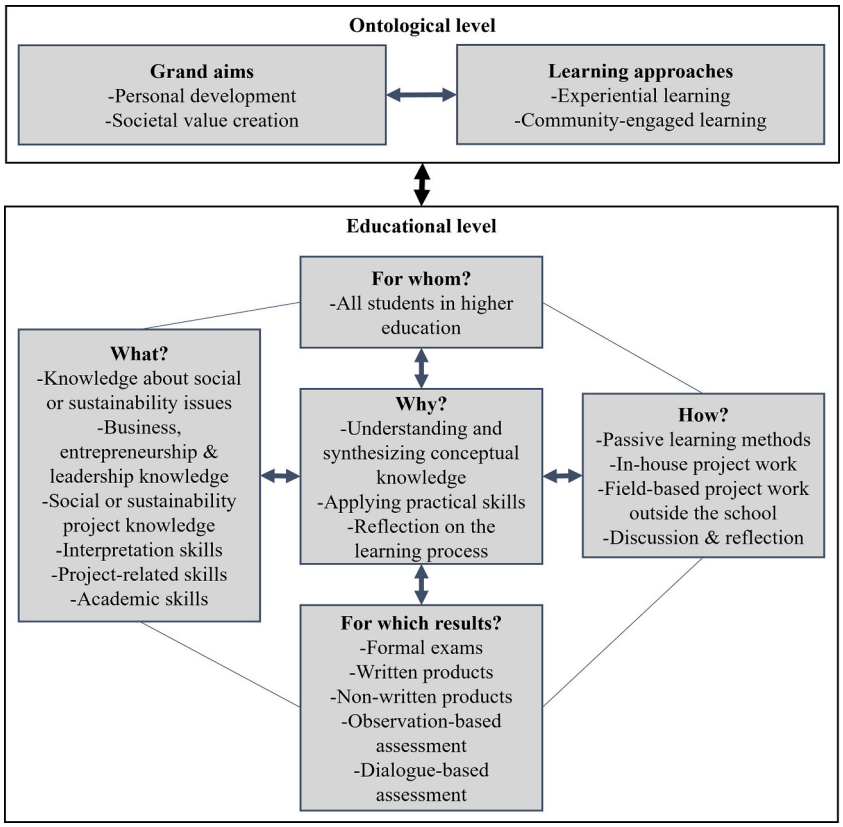


**Fig. 3.** Teaching model for change agents.

available. These assessment methods are less frequently used probably because teaching staff and students lack experience with them, evidence on the validity of these assessment methods is insufficient, and they are relatively time-consuming.

Regarding evaluating the quality of education, the two streams slightly differ (SSE: 35.4%, SSL: 33.3%). Most often, these evaluations were presented in the form of a scientific research paper on a form of education. Studies rely on quantitative data, such as formal course evaluation questionnaires and validated self-evaluation scales, to measure students' development (see for instance Iachini et al., 2015; Ploum et al., 2018). In addition, studies often rely on qualitative interviews with students, educators, and external stakeholders. In SSE, we found studies that use formal impact indicators, such as the number of stakeholders involved in the education process and the number of network contacts gathered. In contrast with the ontological aims of many (mostly SSE) studies, we found few indicators that measure the value created for society. The lack of evidence for value creation was noted earlier by Mirabella and Eikenberry (2017), which is part of this review.

## 5. Synthesis and conclusion

Next, we use the insights into the SSE and SSL literature to develop a constructively aligned teaching model for change agent education. Based on the review and synthesis, we draw conclusions.

### 5.1. Considerations for a teaching model for change agent education

To become a change agent who can help solving GSCs, students need to become leaders with an entrepreneurial mindset who can create value for society. To this end, change agent education must include students' acquisition of knowledge and skills (van Lunenburg et al., 2020), attitude (Baggen & Kaffka, 2022), and personal development (Figueiró & Raufflet, 2015; Shriberg & MacDonald, 2013) as well as the implementation of multidisciplinary education (Gibbons et al., 1994; Stock & Burton, 2011). The multidisciplinary education combines relevant knowledge and skills from the natural sciences, social sciences, and humanities for each problem domain, as well as insights from entrepreneurship and leadership. Furthermore, experiential learning and community-engaged learning allow students to learn to create value with peers, teachers, and societal stakeholders *through* a learning process characterized by uncertainty (Baggen et al., 2021). Finally, considering the value-laden character of GCSs, students should understand ethical considerations and develop an empathetic mindset.

### 5.2. Ontological level

We observed that the SSL and SSE streams have similar aims and are complementary in education (see Fig. 3, Ontological level): SSL has an inward focus on personal development, whereas SSE has an outward focus on action and the creation of societal value. For change agent education, we deem both goals a necessity. Effective change agents must be motivated and be able to accelerate change. On the one hand, students should understand how to position themselves and their learning process relative to helping to solve GSCs. Accordingly, personal development is key. Personal development enables students to understand, define, and (possibly) redefine their values. On the other hand, change agents need to engage actively in the creation of societal value to gain valuable experiences from real-life projects. Experiential learning and community-engaged learning are learning approaches that help translate personal development and social value creation into education programs and courses at the same time. Both approaches encourage reflection on the experiences from real-life projects to accelerate personal development. Furthermore, both streams value conceptual knowledge about understanding societal problems and entrepreneurship or leadership theories. Thus, we follow Addae and Ellenwood's (2022) recommendation to optionally include classroom-based approaches to learning at the ontological level, depending on the level of knowledge of the target group. Conceptual knowledge provides students with a solid knowledge base to interpret their experiences in the field, which enables them to grow as change agents. Finally, as an optional approach, we mention critical pedagogies, which can help students to gain an understanding of the ethical aspects and social injustice in the problems and solutions they pose. This approach can help students to gain the values and mindset that change agents need to make a positive impact.

### 5.3. Educational level

These ontological considerations form the input for the educational level. To aid practitioners, we added references to literature that might help with making the teaching model more concrete. However, these are indications, other references are equally valid.

#### 5.3.1. For whom?

Based on our findings, the change agent teaching model is intended for all students (for whom), albeit the content of the program needs to be tailored to their specific disciplinary background and their level of studies (bachelor, master, or post-graduate). Given the complex nature of GSCs, we recommend change agent education in which students with different backgrounds collaborate in an interdisciplinary manner. Discipline-oriented programs, such as business schools and (sustainable) leadership programs that aim to contribute to solving GSCs can draw inspiration from each other via our teaching model, by bringing their students in contact with each other, and with students from other programs that are more natural science focused.

#### 5.3.2. Why?

Regarding the learning goals, Fig. 3 shows that the goals mirror the aims and learning approaches; understanding and synthesizing

conceptual knowledge about GSCs, possible solutions, and how to implement these; acquiring and applying practical skills to analyze GSCs, identify viable solutions, and realize to change; developing an entrepreneurial, value-driven mindset; and reflecting on the learning process.

#### 5.3.3. What?

Content-wise, our teaching model for change agents covers the knowledge and skills to diagnose problems and the process to start solving these problems and understand the pros and cons of different possible outcomes. Section 4.2.3 already contains some examples. Fig. 3 shows that the teaching model includes knowledge about social or sustainability issues such as the SDGs and characteristics of GSCs (Voegtlin et al., 2022), and systems thinking (i.e. Williams et al., 2017). Moreover, depending on the focus of the change agent, the model could include theories about the behavior and strategies of businesses large and small in the context of these challenges (i.e. Van Mossel et al., 2018) to understand how actors behave in transitions, entrepreneurship or starting a business (i.e. Osterwalder & Pigneur, 2010)), institutional entrepreneurship (i.e. Battilana et al., 2009), systems entrepreneurship (Schlaile et al., 2021) and leadership (i.e. Bass, 1990; Goleman, 2000), as well as knowledge about how to design, run and systematically analyze social or sustainability projects (i.e. De Vicente Lopez & Matti, 2016; van Rijnsoever & Leendertse, 2020). Critical in the light of solving sustainability-related issues is the input from multiple related disciplines. Skill-wise, students need critical thinking, collaborative learning and creativity skills to understand problems in a value-laden, systemic, and multi-stakeholder environment and connect the proper and acceptable solutions to these problems in collaboration with stakeholders from within and outside of academia (van den Beemt et al., 2022). Furthermore, students need skills to design and execute projects to ignite societal change. Another desirable skill is the ability to forecast and think in different scenarios to deal with uncertainty (Bishop et al., 2007; Van den Ende et al., 2022), and to develop adaptive expertise to be able to deal with changing circumstances (Kua et al., 2021; Pelgrim et al., 2022). Finally, academic (or research) skills help students to understand the materials they study, reflect on such materials, contribute to theories of societal change, and give back knowledge and insights into their experiences to future generations. Moreover, such skills can help students to combine their role as an active change agent and an academic who gathers and works with scientific evidence.

Finally, in our review we did not discern skills from mindset because the two terms were difficult to separate. Klapper and Fayolle (2023) observed that mindset is rarely discussed in SSE. Nevertheless, they noted that change agent education should include content and methods that enable the development of a sustainable, entrepreneurial mindset among students. This concept is congruent with SSL, where the social change model of leadership (Astin, 1996) is strongly based on changing the mindset of students, and can thus be a valuable addition to the teaching model.

#### 5.3.4. How?

In terms of pedagogies, we recommend various approaches (see Fig. 3). We view a modest role for passive learning methods to convey conceptual knowledge, such as readings, lectures, or possibly videos or podcasts. For change agent education, applying this knowledge, understanding and solving societal problems, and understanding political sensitivity with various stakeholders are greatly important. This requires that students get the opportunity to experience the complex, iterative and uncertain process of new value-creation that is needed to help solving societal issues. Hence, in-house and field-based projects should complement the passive learning methods. These approaches facilitate the learning-by-doing process needed to acquire the change agent skills. In entrepreneurship education, such learning is referred to as wide entrepreneurship education (Baggen et al., 2022) or value-creation pedagogies (Lackéus, 2020). In such education, students are stimulated to create value for others. Lackéus proposes that such education should – next to value-creation – capture interaction with the outside world, team collaboration and feedback and support from external people. Similarly, Baggen et al. (2022) present design principles for developing entrepreneurial education that stimulates students to experience the entrepreneurial process of value-creation. The design principles invite teachers to create education that allows for complexity and uncertainty – aligned with the prior knowledge and experience of the target group. Furthermore, discussion and reflection are required to accelerate personal development, for instance, through coaching groups of students.

#### 5.3.5. For which results?

Finally, our results show that assessment is the least developed aspect of the teaching model in both literature streams (see Fig. 3 for an overview). We found that formal exams and written and non-written products are often used to test the minimal level of conceptual knowledge and assess interpretation skills. Written and non-written products can also be used to assess the reflection on the learning process. We recommend employing observation-based methods as well because they allow for direct observation of change agent skills, rather than an indirect description by others. Other fields experience similar struggles. For instance, Redman et al. (2021) found that for the assessment of sustainability competencies, scaled self-assessment was the most often used method. Additional scholarship of teaching and learning is required to establish valid assessment methods and improve innovative assessment methods. An example is dialogue-based assessment. We encourage exploring dialogue-based assessment when assessing personal development. Students, stakeholders, and assessors can jointly reflect on their analysis of the problem, the societal impact made, and their respective roles in the process and learning trajectory. Another promising assessment method is the use of internal feedback in combination with group dialogue (see Nicol & Selvaretnam, 2022). Nicol (2021) argues how the generation of internal feedback, via explicit, multiple comparison processes, can enhance learning and the quality of student performance. For instance, students could compare their generated work to that of multiple peers, reflect on the quality of their own work based on the work of others, and discuss their findings with their teacher. The use of design scenarios could also be useful to test the adaptive expertise of the students (Walker et al., 2006), but can also be applied to other skills. This assessment method was not found in the papers we reviewed.

### 5.4. Reflection on the teaching model

The teaching model that we describe blends insights from SSE and SSL, multidisciplinary knowledge and skills associated with GSCs. The model incorporates personal development programs as part of experiential, real-life learning.

A limitation of our teaching model is that it is based on only two complementary streams of literature. Other papers beyond these streams can also contribute to a teaching model for change agent education. Examples that might enrich the teaching model from the conceptual knowledge side are literature on social movements, activism and socio-technical transitions. Literature with an impact approach, such as feminism, might give inspiration for pedagogies to develop the skills and mindsets of students. Further, literature on entrepreneurial leadership could inform the ontological level of the teaching model ('personal development') and the 'what' of change agent education. The transformational nature and authenticity receives growing attention in studies on entrepreneurial leadership, which aligns with the ideas of leadership in change agent education (Galloway et al., 2015; Leitch & Volery, 2017). The study of medicine might give insights in how to deal with stakeholders and citizens professionally. Insights from coaching practices might help students reflect on their learning processes.

Another limitation is that we only used scientific journal articles in our study. However, scientific journal articles do not represent all forms of SSE and SSL education. We recommend future researchers to also study other sources, such as course syllabi, program descriptions, and course evaluations, to enrich the teaching model.

Third, our teaching model is ambitious, a single semester-long course is probably insufficient to train change agents. Rather, change agent education should be a progression line that is woven and integrated throughout a curriculum. Only through this approach can students gain experience and undergo a learning-by-doing process needed to acquire the skills, knowledge, and mindset for change agency.

Moreover, our teaching model departs from traditional teaching models, which are often largely based on passive learning methods. The teaching model for change agents requires students and staff to work with societal stakeholders and make a societal impact in joint education programs in which students and professionals ideally work together as co-learners and co-creators of new knowledge (Baggen & Kaffka, 2022). Such activities are not available to most academics for training during or after their PhD. Thus, several stakeholders from outside the teaching process must be involved or staff must be allowed to work in external organizations to gain additional experience in creating societal impact (Van Rijnsoever et al., 2021). Teachers should also be trained for their role in change agent education. Alternatively, universities could hire more qualified staff from outside academia. In addition, the teaching infrastructure of higher education needs to be adapted. Static rooms must be complemented with facilities where small groups of students can work on their projects and meet stakeholders.

The teaching model for change agents also needs further research on how to evaluate the quality of education. Particularly, considerable attention is needed to understand the societal impact of education. This impact evaluation could be in the form narrative, as is increasingly the standard in research evaluation, though other methods may also be investigated.

## 6. Concluding remarks

In this paper, we developed a constructively aligned teaching model for change agent education based on a literature review of SSE and SSL education. Our review shows that SSE focuses on the creation of societal value, whereas SSL focuses on personal development. Albeit the grand aims between SSE and SSL vary, the learning theories used in both instances are based on experiential and community-engaged learning. SSE and SSL have many overlaps at the ontological and educational levels, but each stream has its respective accents. The insights from both streams formed the basis of an overarching teaching model in which creating societal value and personal development are complementary aims Our synthesis is a first step towards establishing an evidence-based, systematically articulated teaching model for change agent education that can be used by educators from SSE and SSL alike, and that targets students in higher education from all disciplines. However, as noted above, the model needs practical application. For this it, it should be fully integrated into the curricula of higher education programs, which often require substantial changes in the teaching and learning environments. Therefore, we end this article with an invitation to teachers, education scholars, students, and practitioners to join forces. Together we can experiment with, develop, evaluate, and improve teaching models for change agents inside and outside curricula. This effort will help shape students to become the change agents of the future.

## Author statement

Frank van Rijnsoever, Conceptualization, Methodology, Validation, Investigation, Data Curation, Writing - Original Draft, Writing - Review & Editing, Supervision, Project administration, Funding acquisition, Silas Sitzler, Conceptualization, Methodology, Validation, Investigation, Data Curation, Writing - Original Draft, Yvette Baggen, Conceptualization, Methodology, Validation, Data Curation, Writing - Original Draft, Writing - Review & Editing, Supervision.

## Data availability

Data will be made available on request.

## Acknowledgements

This research received financial support from the Higher Education Research focus area at Utrecht University, and the strategic EWUU-alliance between Eindhoven Technological University Wageningen University and Research, Utrecht University and the University Medical Center Utrecht, as part of an impact project.

## References

Addae, A. E., & Ellenwood, C. (2022). Integrating social entrepreneurship literature through teaching. *Entrepreneurship Education and Pedagogy, 5*(2), 225–244. https://doi.org/10.1177/25151274211021999

Alvarez, S. A., & Busenitz, L. W. (2001). The entrepreneurship of resource-based theory. *Journal of Management, 27*(6), 755–775. https://doi.org/10.1177/014920630102700609

Amatucci, F. M., Pizarro, N., & Friedlander, J. (2013). Sustainability: A paradigmatic shift in entrepreneurship education. *New England Journal of Entrepreneurship, 16*(1), 7–18.

Andruk, C., & Altinay, Z. (2022). Campus sustainability in an entrepreneurial framework. *Journal of Small Business and Enterprise Development, 29*(3), 484–501. https://doi.org/10.1108/JSBED-01-2021-0023

Astin, H. S. (1996). Leadership for social change. *About Campus, 1*(3), 4–10.

Awaysheh, A., & Bonfiglio, D. (2017). Leveraging experiential learning to incorporate social entrepreneurship in mba programs: A case study. *International Journal of Management in Education, 15*(2), 332–349.

Baggen, Y., & Kaffka, G. (2022). *Entrepreneurial literacy and skills*. European Parliament.

Baggen, Y., Lans, T., & Gulikers, J. (2021). Making entrepreneurship education available to all: Design principles for educational programs stimulating an entrepreneurial mindset. *Entrepreneurship Education and Pedagogy, 5*(3), 347–374.

Baggen, Y., Lans, T., & Gulikers, J. (2022). Making entrepreneurship education available to all: Design principles for educational programs stimulating an entrepreneurial mindset. *Entrepreneurship Education and Pedagogy, 5*(3), 347–374.

Barling, J., Weber, T., & Kelloway, E. K. (1996). Effects of transformational leadership training on attitudinal and financial outcomes: A field experiment. *Journal of Applied Psychology, 81*(6), 827.

Bass, B. M. (1990). From transactional to transformational leadership: Learning to share the vision. *Organizational Dynamics, 18*(3), 19–31. https://doi.org/10.1016/0090-2616(90)90061-S

Battilana, J., Leca, B., & Boxenbaum, E. (2009). How actors change institutions: Towards a theory of institutional entrepreneurship. *The Academy of Management Annals, 3*(1), 65–107.

Bayuo, B. B., Chaminade, C., & Göransson, B. (2020). Unpacking the role of universities in the emergence, development and impact of social innovations – a systematic review of the literature. *Technological Forecasting and Social Change, 155*, Article 120030. https://doi.org/10.1016/j.techfore.2020.120030

Béchard, J.-P., Grégoire, D., Kyrö, P., & Carrier, C. (2005). Understanding teaching models in entrepreneurship for higher education. *HEC Montréal, Chaire d'entrepreneuriat Rogers-J.-A.-Bombardier*.

van den Beemt, A., van de Watering, G., & Bots, M. (2022). Conceptualising variety in challenge-based learning in higher education: The CBL-compass. *European Journal of Engineering Education*, 1–18.

Biggs, J. (1996). Enhancing teaching through constructive alignment. *Higher Education, 32*(3), 347–364.

Bishop, P., Hines, A., & Collins, T. (2007). The current state of scenario development: An overview of techniques. *Foresight, 9*(1), 5–25.

Brown, W., & May, D. (2012). *Organizational change and development: The efficacy of transformational leadership training*. Journal of Management Development.

Chang, J., Benamraoui, A., & Rieple, A. (2014). Learning-by-doing as an approach to teaching social entrepreneurship. *Innovations in Education & Teaching International, 51*(5), 459–471.

Chankseliani, M., & McCowan, T. (2021). Higher education and the sustainable development goals. *Higher Education, 81*(1), 1–8.

Compagnucci, L., & Spigarelli, F. (2020). The third mission of the university: A systematic literature review on potentials and constraints. *Technological Forecasting and Social Change, 161*. https://doi.org/10.1016/j.techfore.2020.120284

De Vicente Lopez, J., & Matti, C. (2016). *Visual toolbox for system innovation. A resource book for practitioners to map, analyse and facilitate sustainability transitions*. Transition Hub Series.

Fayolle, A., & Gailly, B. (2008). From craft to science: Teaching models and learning processes in entrepreneurship education. *Journal of European Industrial Training, 32*(7), 569–593.

Felício, J. A., Gonçalves, H. M., & da Conceição Gonçalves, V. (2013). Social value and organizational performance in non-profit social organizations: Social entrepreneurship, leadership, and socioeconomic context effects. *Journal of Business Research, 66*(10), 2139–2146.

Fernhaber, S. A. (2022). Actively engaging with social entrepreneurs: The social enterprise audit. *Entrepreneurship Education and Pedagogy, 5*(2), 192–207. https://doi.org/10.1177/25151274211047443

Figueiró, P. S., & Raufflet, E. (2015). Sustainability in higher education: A systematic review with focus on management education. *Journal of Cleaner Production, 106*, 22–33. https://doi.org/10.1016/j.jclepro.2015.04.118

Galloway, L., Kapasi, I., & Sang, K. (2015). Entrepreneurship, leadership, and the value of feminist approaches to understanding them. *Journal of Small Business Management, 53*(3), 683–692.

Gibbons, M., Limoges, C., Nowotny, H., Schawartzman, S., Scott, P., Trow, M., Baber, Z., Gibbons, M., Limoges, C., Nowotny, H., Schwartzman, S., Scott, P., Trow, M., Schawartzman, S., Scott, P., Trow, M., Baber, Z., Gibbons, M., Limoges, C., … Trow, M. (1994). The new production of knowledge: The Dynamics of Science and Research in contemporary societies. In *Contemporary sociology* (Vol. 24)Sage. https://doi.org/10.2307/2076669.

Gioia, D. A., Corley, K. G., & Hamilton, A. L. (2012). Seeking qualitative rigor in inductive research. *Organizational Research Methods, 16*(1), 15–31. https://doi.org/10.1177/1094428112452151

Goleman, D. (2000). Leadership that gets results. *Harvard Business Review, 78*(2), 4–17.

Grant, M. J., & Booth, A. (2009). A typology of reviews: An analysis of 14 review types and associated methodologies. *Health Information and Libraries Journal, 26*(2), 91–108.

Hägg, G., & Gabrielsson, J. (2020). A systematic literature review of the evolution of pedagogy in entrepreneurial education research. *International Journal of Entrepreneurial Behavior & Research, 26*(5), 829–861.

Hekkert, M. P., Janssen, M. J., Wesseling, J. H., & Negro, S. O. (2020). Mission-oriented innovation systems. *Environmental Innovation and Societal Transitions, 34*, 76–79.

Iachini, A. L., Cross, T. P., & Freedman, D. A. (2015). Leadership in social work education and the social change model of leadership. *Social Work Education, 34*(6), 650–665.

Johnson, M. P., & Schaltegger, S. (2020). Entrepreneurship for sustainable development: A review and multilevel causal mechanism framework. *Entrepreneurship Theory and Practice, 44*(6), 1141–1173.

Jolly, S., Spodniak, P., & Raven, R. P. J. M. (2016). Institutional entrepreneurship in transforming energy systems towards sustainability: Wind energy in Finland and India. *Energy Research & Social Science, 17*, 102–118.

Jones, B., & Iredale, N. (2010). Enterprise education as pedagogy. *Education + Training, 52*(1), 7–19.

Joyce, B., Weil, M., & Calhoun, E. (2003). *Models of teaching*.

Kark, R., Preser, R., & Zion-Waldoks, T. (2016). From a politics of dilemmas to a politics of paradoxes: Feminism, pedagogy, and women's leadership for social change. *Journal of Management Education, 40*(3), 293–320.
Kaufman, E. K., & Stedman, N. L. (2022). Moving graduate and professional education forward to develop leaders equipped to effectively address wicked problems. *New Directions for Student Leadership, 2022*(176), 9–18. https://doi.org/10.1002/yd.20526
Kelloway, E. K., Barling, J., & Helleur, J. (2000). *Enhancing transformational leadership: The roles of training and feedback*. Leadership & Organization Development Journal.
Kim, M. G., Lee, J.-H., Roh, T., & Son, H. (2020). Social entrepreneurship education as an innovation hub for building an entrepreneurial ecosystem: The case of the kaist social entrepreneurship mba program. *Sustainability, 12*(22), 1–23. https://doi.org/10.3390/su12229736
Kistruck, G. M., & Beamish, P. W. (2010). The interplay of form, structure, and embeddedness in social intrapreneurship. *Entrepreneurship Theory and Practice, 34*(4), 735–761.
Klapper, R. G., & Fayolle, A. (2023). A transformational learning framework for sustainable entrepreneurship education: The power of Paulo Freire's educational model. *International Journal of Management in Education, 21*(1), Article 100729.
Komives, S. R., Mackie, M. M., Shalka, T. R., & Smith, M. (2020). Spirituality and leadership: Research supports the connection. *New Directions for Student Leadership, 2020*(166), 135–157.
Kua, J., Lim, W.-S., Teo, W., & Edwards, R. A. (2021). A scoping review of adaptive expertise in education. *Medical Teacher, 43*(3), 347–355.
Lackéus, M. (2020). Comparing the impact of three different experiential approaches to entrepreneurship in education. *International Journal of Entrepreneurial Behavior & Research, 26*(5), 937–971.
Lans, T., Blok, V., & Wesselink, R. (2014). Learning apart and together: Towards an integrated competence framework for sustainable entrepreneurship in higher education. *Journal of Cleaner Production, 62*, 37–47.
Leitch, C. M., & Volery, T. (2017). Entrepreneurial leadership: Insights and directions. *International Small Business Journal, 35*(2), 147–156.
Litzky, B. E., Godshalk, V. M., & Walton-Bongers, C. (2010). Social entrepreneurship and community leadership: A service-learning model for management education. *Journal of Management Education, 34*(1), 142–162.
van Lunenburg, M., Geuijen, K., & Meijer, A. (2020). How and why do social and sustainable initiatives scale? A systematic review of the literature on social entrepreneurship and grassroots innovation. *Voluntas: International Journal of Voluntary and Nonprofit Organizations, 31*(5), 1013–1024. https://doi.org/10.1007/s11266-020-00208-7
Maguire, S., Hardy, C., & Lawrence, T. B. (2004). Institutional entrepreneurship in emerging fields: HIV/AIDS treatment advocacy in Canada. *Academy of Management Journal, 47*(5), 657–679.
Mayring, P. (2000). *Qualitative inhaltsanalyse. Grundlagen und techniken (7th editio)*. Deutscher Studien Verlag.
Michel, N., Cater, J. J., III, & Varela, O. (2009). Active versus passive teaching styles: An empirical study of student learning outcomes. *Human Resource Development Quarterly, 20*(4), 397–418.
Mirabella, R. M., & Eikenberry, A. M. (2017). The missing "social" in social enterprise education in the United States. *Journal of Public Affairs Education, 23*(2), 729–748.
Muñoz, P., Janssen, F., Nicolopoulou, K., & Hockerts, K. (2018). Advancing sustainable entrepreneurship through substantive research. *International Journal of Entrepreneurial Behavior & Research, 24*(2), 322–332.
Muralidharan, E., & Pathak, S. (2018). Sustainability, transformational leadership, and social entrepreneurship. *Sustainability, 10*(2), 567.
Nabi, G., Liñán, F., Fayolle, A., Krueger, N., & Walmsley, A. (2017). The impact of entrepreneurship education in higher education: A systematic review and research agenda. *The Academy of Management Learning and Education, 16*(2), 277–299.
Nicol, D. (2021). The power of internal feedback: Exploiting natural comparison processes. *Assessment & Evaluation in Higher Education, 46*(5), 756–778.
Nicol, D., & Selvaretnam, G. (2022). Making internal feedback explicit: Harnessing the comparisons students make during two-stage exams. *Assessment & Evaluation in Higher Education, 47*(4), 507–522.
Northouse, P. G. (2019). *Introduction to leadership: Concepts and practice*. Sage Publications.
OECD. (2018). The future of education and skills: Education 2030. In *OECD education working papers*.
Osterwalder, A., & Pigneur, Y. (2010). *Business model generation: A handbook for visionaries, game changers, and challengers*. John Wiley & Sons.
Ottaway, R. N. (1983). The change agent: A taxonomy in relation to the change process. *Human Relations, 36*(4), 361–392.
Pache, A.-C., & Chowdhury, I. (2012). Social entrepreneurs as institutionally embedded entrepreneurs: Toward a new model of social entrepreneurship education. *The Academy of Management Learning and Education, 11*(3), 494–510.
Pelgrim, E., Hissink, E., Bus, L., van der Schaaf, M., Nieuwenhuis, L., van Tartwijk, J., & Kuijer-Siebelink, W. (2022). Professionals' adaptive expertise and adaptive performance in educational and workplace settings: An overview of reviews. *Advances in Health Sciences Education, 1–19*.
Pischetola, M., & De Souza e Silva Martins, L. (2021). Teaching social entrepreneurship in higher education: Active pedagogy in a deweyan perspective. *Journal of Social Entrepreneurship*, 1–22.
Pittaway, L., & Cope, J. (2007). Entrepreneurship education: A systematic review of the evidence. *International Small Business Journal, 25*(5), 479–510.
Pizarro, N., & Graybeal, G. M. (2022). Learning design thinking: A social innovation jam. *Entrepreneurship Education and Pedagogy, 5*(2), 208–224. https://doi.org/10.1177/25151274211014082
Ploum, L., Blok, V., Lans, T., & Omta, O. (2018). Toward a validated competence framework for sustainable entrepreneurship. *Organization & Environment, 31*(2), 113–132.
Redman, A., Wiek, A., & Barth, M. (2021). Current practice of assessing students' sustainability competencies: A review of tools. *Sustainability Science, 16*, 117–135.
van Rijnsoever, F. J., & Leendertse, J. (2020). A practical tool for analyzing socio-technical transitions. *Environmental Innovation and Societal Transitions, 37*, 225–237. https://doi.org/10.1016/j.eist.2020.08.004
Rivers, B. A., Armellini, A., & Nie, M. (2015). Embedding social innovation and social impact across the disciplines: Identifying "Changemaker" attributes. *Higher Education, Skills and Work-based Learning, 5*(3), 242–257.
Sachs, J. D. (2012). From millennium development goals to sustainable development goals. *The Lancet, 379*(9832), 2206–2211.
Saebi, T., Foss, N. J., & Linder, S. (2019). Social entrepreneurship research: Past achievements and future promises. *Journal of Management, 45*(1), 70–95.
Santos, F. M. (2012). A positive theory of social entrepreneurship. *Journal of Business Ethics, 111*(3), 335–351.
Scardamalia, M., Bransford, J., Kozma, B., & Quellmalz, E. (2012). New assessments and environments for knowledge building. In *Assessment and teaching of 21st century skills* (pp. 231–300). Springer.
Schlaile, M. P., Urmetzer, S., Ehrenberger, M. B., & Brewer, J. (2021). Systems entrepreneurship: A conceptual substantiation of a novel entrepreneurial "species.". *Sustainability Science, 16*, 781–794.
Shahid, S. M., & Alarifi, G. (2021). Social entrepreneurship education: A conceptual framework and review. *International Journal of Management in Education, 19*(3), Article 100533.
Sharma, S., Goyal, D. P., & Singh, A. (2020). *Systematic review on sustainable entrepreneurship education (SEE): A framework and analysis*. World Journal of Entrepreneurship, Management and Sustainable Development.
Shriberg, M., & MacDonald, L. (2013). Sustainability leadership programs: Emerging goals, methods & best practices. *Journal of Sustainability Education, 5*(1), 1–21.
Smith, I. H., & Woodworth, W. P. (2012). Developing social entrepreneurs and social innovators: A social identity and self-efficacy approach. *The Academy of Management Learning and Education, 11*(3), 390–407.
Souto, J. E., & Rodriguez-Lopez, A. (2021). Entrepreneurial learning in an experiential and competences training context: A business plan in bachelor thesis. *International Journal of Management in Education, 19*(3), Article 100513.
van Stijn, N., van Rijnsoever, F. J., & Van Veelen, M. (2018). Exploring the motives and practices of university–start-up interaction. Evidence from Route 128. *The Journal of Technology Transfer, 43*(3), 674–713. https://doi.org/10.1007/s10961-017-9625-5

Stock, P., & Burton, R. J. F. (2011). Defining terms for integrated (multi-inter-trans-disciplinary) sustainability research. *Sustainability, 3*(8), 1090–1113. https://doi.org/10.3390/su3081090

Talmage, C. A., & Gassert, T. A. (2022). Enhancing social entrepreneurship education with dark side theory to frame social enterprises. *Entrepreneurship Education and Pedagogy, 5*(2), 245–263. https://doi.org/10.1177/25151274211022282

The United Nations. (2017). *The sustainable development goals report*.

Tiba, S., van Rijnsoever, F. J., & Hekkert, M. P. (2018). Firms with benefits: A systematic review of responsible entrepreneurship and corporate social responsibility literature. *Corporate Social Responsibility and Environmental Management, 26*(2), 265–284. https://doi.org/10.1002/csr.1682

Toledano, N. (2020). Promoting ethical reflection in the teaching of social entrepreneurship: A proposal using religious parables. *Journal of Business Ethics, 164*(1), 115–132.

Trencher, G., Yarime, M., McCormick, K. B., Doll, C. N. H., & Kraines, S. B. (2014). Beyond the third mission: Exploring the emerging university function of co-creation for sustainability. *Science and Public Policy, 41*(2), 151–179.

Tugas, F. (2019). Applying the social change model of leadership development to the practice of student employment. *New Directions for Student Leadership, 162*, 121–130.

Van Mossel, A., Van Rijnsoever, F. J., & Hekkert, M. P. M. P. (2018). Navigators through the storm: A review of organization theories and the behavior of incumbent firms during transitions. *Environmental Innovation and Societal Transitions, 26*, 44–63. https://doi.org/10.1016/j.eist.2017.07.001

Van Rijnsoever, F. J., de Boer, T., & Deuten, J. (2021). *Tussen uitvinding en uitdaging - over de relatie tussen universiteiten, start-ups en de samenleving*. https://www.rathenau.nl/nl/innovatiekracht-inzetten-voor-maatschappelijke-opgaven/tussen-uitvinding-en-uitdaging.

Van den Ende, M. A., Wardekker, A., Hegger, D. L. T., Mees, H. L. P., & Vervoort, J. M. (2022). *Towards a climate-resilient future together: Tools for engaging citizens for a better future*. Springer Nature.

Vervoort, J. M., Rutting, L., Kok, K., Hermans, F. L. P., Veldkamp, T., Bregt, A. K., & van Lammeren, R. (2012). Exploring dimensions, scales, and cross-scale dynamics from the perspectives of change agents in social–ecological systems. *Ecology and Society, 17*(4).

Vidra, R. L., Gallagher, D. R., & Wilson, V. (2019). Acknowledging the challenges of pedagogical innovation: The case of integrating research, teaching, and the practice of environmental leadership. *Journal of Environmental Studies and Sciences, 9*(3), 270–275.

Voegtlin, C., Scherer, A. G., Stahl, G. K., & Hawn, O. (2022). Grand societal challenges and responsible innovation. *Journal of Management Studies, 59*(1), 1–28.

Walker, J. M. T., Cordray, D. S., King, P. H., & Brophy, S. P. (2006). Design scenarios as an assessment of adaptive expertise. *International Journal of Engineering Education, 22*(3), 645–651.

Watt, W. M. (2009). Facilitating social change leadership theory: 10 recommendations toward effective leadership you are here. *Journal Leadership Education, 8*(8).

Wijen, F., & Ansari, S. (2007). Overcoming inaction through collective institutional entrepreneurship: Insights from regime theory. *Organization Studies, 28*(7), 1079–1100. https://doi.org/10.1177/0170840607078115

Williams, A., Kennedy, S., Philipp, F., & Whiteman, G. (2017). Systems thinking: A review of sustainability management research. *Journal of Cleaner Production, 148*, 866–881.