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# Competencies of experienced sustainability professionals

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This paper presents an empirical study on key competencies of experienced sustainability professionals. We use an elaborate action research approach to collect and analyze qualitative data from sustainability professionals in Belgium (Wallonia). The iterative action-reflection process included a written assignment, an interactive workshop, qualitative data analyses, focus-group discussions, and the corroboration of findings through participant feedback. The 18 participating sustainability professionals had on average 24 years of work experience out of which 17 years in the field of sustainability. Our analysis provides strong empirical evidence for the existence of Sustainability Intervention Competencies which is a cluster of six key competencies, namely interpersonal collaboration competency, capacity building competency, intrapreneurial competency, strategic competency, political competency, and implementation competency. Together with a set of basic sustainability competencies they enable the profound analysis and understanding of sustainability issues, the co-creation of innovative solutions, and the facilitation of transition processes toward a sustainable future. Furthermore, we present empirical evidence for an integrated learning competency which binds two complementary forms of knowledge together, namely topical knowledge and lived experience. This study contributes to the newly forming empirical research stream on competencies of sustainability professionals in Sustainability Science. We outline implications for Human Resource Management as well as Higher Education and Vocational Training.

## KEYWORDS

sustainable development, competencies, competency, professionals, practitioners, skills, sustainability, sdg

## Introduction

The twenty-twenties started with unrest and instability. A global pandemic, war, poverty, gender inequality, mass extinction of animals and plants, depletion of natural resources, and climate change are just a few examples of mounting sustainability issues. We need to rethink and reinvent our norms, values, and practices toward sustainability if we want our children and grandchildren not to fight over the scraps our generation has left. Governments, public administration, business, and civil society have to put sustainable development, which has been defined as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (WCED, 1987, p. 41), on top of their agendas. New ideas and innovations are needed for a sustainable future. This requires collaboration and co-creation across sector boundaries (Waddock, 1988).

Fortunately, a rapidly growing group of practitioners from a wide array of fields and occupations stands up to the challenge (Willard et al., 2010). They develop innovative solutions to sustainability issues together with stakeholders. These practitioners have been

called ‘change agents,’ ‘integrated catalysts,’ ‘sustainability managers,’ and ‘sustainability professionals’ amongst others (Akrivou and Bradbury-Huang, 2015; Hesselbarth and Schaltegger, 2014; MacDonald et al., 2020; Willard et al., 2010). It is becoming increasingly evident that we witness the rise of an entirely new profession (Perez Salgado et al., 2018; Salovaara and Soini, 2021; Venn et al., 2022). Sustainability professionals can be defined as professional practitioners who secure their livelihood by contributing to sustainable development while taking stewardship for their profession (Venn et al., 2022). We use this definition and emphasize that sustainability professionals are a heterogeneous group with various educational backgrounds and attainments. Due to the novelty of this profession, we know little about the key competencies of sustainability professionals. Competencies can be defined as an integrated set of knowledge, skills, and attitudes which enable a person to be successful in a specific context or situation (Baartman et al., 2007). Sound insights into competencies are a prerequisite for proper vocational training and effective Human Resource Management (HRM). Sparked by the United Nations (United Nations, 2002) and UNESCO (Michelsen and Wells, 2017; UNESCO, 2020) a significant body of literature on future skills and sustainability competencies has built up in the field of Higher Education (e.g., de Haan, 2006; Lambrechts et al., 2013; Wiek et al., 2011). Yet, this research is focused on students and has been relying on opinions of higher education experts to identify promising competencies (cf. Brundiers et al., 2020). We know little about the usefulness of these competencies in real-world settings. Empirical research into key competencies of sustainability professionals is scarce today which constitutes a significant gap in literature. This holds especially because it has often been argued that research into competencies should make experienced practitioners the focal point of the analysis (cf. Stoof et al., 2002; Van der Klink and Boon, 2002).

The aim of this study is to provide a better understanding of key competencies of experienced sustainability professionals. This study uses an action research approach to identify competencies, because it takes contextual embeddedness and practical knowledge of participants into account while enabling a rigorous process to corroborate findings (Akrivou and Bradbury-Huang, 2015; Perez Salgado et al., 2015, 2018). The participants of this study had on average 24 years of work experience out of which 17 years in the field of sustainability. We use the terms sustainability and sustainable development interchangeably, as is customary in literature (cf. Waas et al., 2011).

The remainder of this paper is structured as follows. First, we will discuss literature from emerging empirical research in sustainability science which is exploring key competencies of sustainability professionals. Next, we will describe the action research design that was used to collect and analyze empirical data from sustainability professionals in Belgium (Wallonia). We outline the process of triangulation which ensures analytical rigor and robustness of our findings. The Results section will then present the insights on key competencies of experienced sustainability professionals. The corroborated competency model includes three clusters of competencies, namely Sustainability Intervention Competencies, basic sustainability competencies, and an integrated learning competency. The last chapter draws conclusions and discusses limitations of this research.

## Competencies of sustainability professionals

Empirical research on key competencies of sustainability professionals is scarce, but gaining momentum in the field of sustainability science. First insights were provided by Willard et al. (2010) who conducted a survey amongst members of the International Society of Sustainability Professionals (mostly located in the United States). Results indicate that the ability to communicate with stakeholders is crucial for professionals working on sustainable development. Furthermore, competencies in problem solving, inspiring and motivating others, strategic planning, systems-thinking, and project management proved important (Willard et al., 2010). Finally, the survey shows that collaboration, process facilitation, consensus building, and the ability to influence change within and outside an organization are of relevance as well.

Hesselbarth and Schaltegger (2014) surveyed graduates of the worldwide first MBA program on sustainability management at the Leuphana University in Germany. Their results underline the importance of methodological, social, and personal competencies. Furthermore, interpersonal collaboration, the ability to take the initiative, values-thinking, as well as information and media literacy were significant for sustainability managers especially when compared to alumni that did not pursue a career in sustainability (Hesselbarth and Schaltegger, 2014). MacDonald and Shriberg (2016) found in a survey amongst early stage professionals, who recently graduated from sustainability leadership programs, that alumni have strong confidence in acquired sustainability knowledge. However, this knowledge seems to have little value in the workplace. Instead, practical skills, such as negotiation, public speaking, process facilitation, and coalition building, were appreciated more. The survey documents a significant mismatch between knowledge and skills acquired in higher education and the ones needed in real life. Overall, early empirical studies indicate that competencies of sustainability professionals need to be action-oriented and focused on collaboration, co-creation, and change facilitation.

Perez Salgado et al. (2018) conducted an empirical study with sustainability professionals from The Netherlands. Findings underscore the relevance of an intervention related competency which has been defined as the ability “to devise, in a process of consultation with relevant stakeholders, one or several solution(s) or decisions for a sustainability issue and subsequently successfully conduct the change process toward sustainability” (p. 168). Furthermore, multistakeholder collaboration, co-creation, and the ability to initiate change processes proved to be important in the workplace. This is in line with MacDonald et al. (2020), who interviewed sustainability managers in municipalities across Canada. More than 80% of the interviewees underline that communication with different stakeholders, change facilitation, intervention formulation and implementation are the most important competencies to promote sustainable development. Furthermore, an interpersonal competency (listening to stakeholders and incorporating their ideas into decision making) and strategic-thinking were mentioned. Interestingly, less than half of the interviewed sustainability managers outlined futures-thinking, values-thinking, and systems-thinking as being important. This is striking, because many frameworks in higher education emphasize the importance of these particular competencies for students.

Salovaara and Soini (2021) interviewed alumni of a sustainability focused master program in Finland. They revealed that “interpersonal competence was most often mentioned with emphasis on collaboration” (p. 79). Furthermore, they stress the role of empathy. Mabon and Shih’s (2021) comparative analysis of climate change adaptation initiatives in three different Asian countries outline cross-sector collaboration and the significance of a “competency in getting things done and making interventions happen” (p. 11). This is in line with an empirical study on competencies of senior sustainability professionals from Dutch speaking part of Belgian (Venn et al., 2022). This study used an iterative action-reflection process to identify sustainability-competencies. Findings provide empirical evidence for the existence of an intervention related competency cluster. Venn et al. (2022) outline that sustainability professionals need competencies not only to analyze and understand sustainability issues, but competencies which help them to develop innovative solutions as well as competencies to foster change. Important competencies are interpersonal collaboration, capacity building, strategic-political thinking and acting, the capacity to act as an internal entrepreneur, and the capacity to implement solutions.

Overall, research on competencies of sustainability professionals has mainly identified competencies related to stakeholder collaboration and change facilitation. However, this research field is still in its early stages and we need more empirical insights to develop a comprehensive competency framework for sustainability professionals. Table 1 presents an *a-priori* framework of competencies for sustainability professionals based on our literature review. The emerging 29 *a-priori* codes will be used to analyze the qualitative data collected during this study. The following chapter outlines the methodological basis of this action research study.

## Methodology

Professional practitioners usually operate in dynamic settings where they have to adapt and continuously sharpen their competences (Stoof et al., 2002). This holds especially for sustainability professionals which face complex ‘wicked problems’ (Weber and Khademian, 2008). In order to reflect the distinctive qualitative structure of competencies within a profession (Van der Klink and Boon, 2002) a discursive approach that allows for interaction, dialogue, and probing is needed (Perez Salgado et al., 2018). We choose an action research design which is an established qualitative methodology next to grounded theory and case studies research (Creswell et al., 2007).

Lewin (1946) introduced action research as a novel method where researcher and research subject directly interact in a collaborative manner. Action research follows a interpretivist philosophy and draws on critical theory and constructivism (Baum et al., 2006; Kemmis, 2010; McNiff, 2013; Reason and Bradbury, 2006, 2008). It can be defined as a collective, self-reflective inquiry undertaken by participants in order to improve the rationality and justice of their own social practices as well as the understanding of these practices and the situations in which these practices are carried out (Kemmis et al., 2014). Its core element is a cyclical process called the ‘self-reflective spiral’ (Kemmis et al., 2014; McNiff, 2013) with the stages of planning, acting, observing, and reflecting (Eden and Huxham, 1996; Zuber-Skerritt, 2001). In this study we executed four action reflection cycles.

Action research has to be applied as an adaptive process rather than a rigid step-by-step approach (Altrichter et al., 2002; Kemmis, 2010). Variables are not predetermined, but arise from iterations between action and reflection (Kemmis et al., 2014; McNiff, 2013; Zuber-Skerritt, 2001). Since there is no prescribed design, action researchers need to “enact a process based on declared-in-advance methodology...in such a way that the process is recoverable by anyone interested in subjecting the research to critical scrutiny” (Checkland and Holwell, 1998, p. 18). Therefore we decide to establish general guidelines for planning and execution of the action cycles (Checkland and Holwell, 1998; Eden and Huxham, 1996). For example, we use techniques for qualitative data analysis that have been well-established in action research (Creswell et al., 2007; Dick, 2007; Sankaran and Dick, 2015) and draw insights only after comprehensive triangulation (Lennie, 2006; Melrose, 2001). Thereby we can ensure academic integrity, rigor, and reliability (Bradbury Huang, 2010; Frauenberger et al., 2015; Levin, 2012). Our study consists of four stages, namely the identification and selection of participants, an interactive workshop, data analysis with subsequent focus-group discussions, and finally feedback and approval of findings by the workshop participants.

### First stage: identification and selection of a local partner and suitable participants

We assembled a multidisciplinary research team to enhance opportunities for theoretical, methodological, and analytical triangulation (Lennie, 2006; Melrose, 2001). Next, we identified a local organization in Belgium (Wallonia) which could assist with our data collection. l’Institut Eco-Conseil (Eco-Conseil) is an NGO that provides basic and advanced training programs for sustainability professionals in the French and German speaking parts of Belgium since 1989. Eco-Conseil provided space and assistance to conduct our research. Together with Eco-Conseil, we identified sustainability professionals based on predetermined selection criteria to limit extraneous variation (Eisenhardt, 1989; Yin, 2009): First, all participants would have to qualify as sustainability professionals as defined earlier (see page 1). Second, participants needed to be able to operate at a senior level. Therefore we only accepted participants with post-graduate training in sustainability and at least 5 years of work experience. Third, all participants needed to have a proven track record of achieving sustainability related transitions in their work.

We relied on our partner organization to select and invite participants. Eco-Conseils has trained more than 1,000 sustainability professionals over the last three decades. The participants of this study were hand-picked from Eco-Conseils’ network based on our selection criteria. Eco-Conseil called the selected professionals their ‘dinosaurs’ to emphasize their extensive experience and achievements in the field. We set a maximum limit of participants to ensure a high degree of interaction during all stages of this action research. 18 sustainability professionals took part the workshop; their average work experience was 24 years out of which they worked 17 years in the field of sustainability. Due to their substantial careers, participants had gathered experiences in different sectors such as public administration, private companies, and civil society organizations. We chose to conduct our data collection in French, because this is the dominant language in Belgium (Wallonia). Table 2 summarizes key characteristics of the participating sustainability professionals.

TABLE 1 Literature based *a-priori* framework of competencies for sustainability professionals.

A-priori code	Description	Author (year) Main place of data collection							
		Willard et al. (2010) USA	Hesselbarth and Schaltegger (2014) Germany	MacDonald and Shriberg (2016) USA	Perez Salgado et al. (2018) Netherlands	MacDonald et al. (2020) Canada	Mabon and Shih (2021) Asia	Salovaara and Soini (2021) Finland	Venn et al. (2022) Belgium
Adaptability	Ability to adapt to different situations	X							
Academic competencies	Analytical Thinking, Critical Thinking, Collecting, analyzing and presenting data	X	X	X				X	X
Boundary spanning	Ability of bridging and spanning boundaries, mediation and consensus facilitation between parties	X				X			X
Capacity building	Ability to convene stakeholders with key knowledge or other resources					X	X		X
Co-creating innovations	Ability to collectively produce interventions for sustainability				X				X
Communication	Ability of verbal and written communication with internal and external stakeholders	X	X	X		X			X
Conflict resolution	Ability to manage and resolve conflicts		X			X			X
Creative thinking	Ability to think creatively and using creative techniques to re-think the existing	X	X						
Empathy	Ability to experience another person's emotion while recognizing that the source of the emotion is not one's own.							X	X
Entrepreneurship	Ability to think and acting as an entrepreneur		X						X
Facilitate change	Ability to facilitate change inside and outside an organization	X		X					X
Futures-thinking	Ability to imagine future scenarios and anticipate developments; comprehension of the possibility, probability, and desirability of future states					X			X
Gaining support	Ability of gaining support, building coalitions and resolving resistance			X					X
Hidden agendas	Being aware of (hidden) stakeholder goals, needs, and intentions								X
Implementation	Ability and motivation to act and implement (self-sustaining) interventions toward sustainability		X		X	X	X		X
Learning	Ability to learn and stay up-to-date		X		X	X			X

(Continued)

TABLE 1 (Continued)

A-priori code	Description	Author (year) Main place of data collection							
		Willard et al. (2010) USA	Hesselbarth and Schaltegger (2014) Germany	MacDonald and Shriberg (2016) USA	Perez Salgado et al. (2018) Netherlands	MacDonald et al. (2020) Canada	Mabon and Shih (2021) Asia	Salovaara and Soini (2021) Finland	Venn et al. (2022) Belgium
Managerial skills	Ability to manage others and act in a management role		X					X	
Multi-stakeholder collaboration	Ability to cooperate and collaborate with in complex multi-stakeholder settings		X	X					X
Political thinking and acting	Ability to maneuver in the idealism-realism dichotomy and to engage in political-strategic thinking and acting, including the abilities to perceive and leverage power positions, to negotiate, and to persuade.	X	X	X	X			X	X
Problem solving	Ability to solve problems	X	X						
Process and project management	Ability to manage processes and projects	X	X						
Reflection and self-management	Ability to reflect oneself, interactions, groups, and ethical questions		X	X				X	
Role modeling	Ability to demonstrate commitment to sustainability through personal actions and inspiring others					X			X
Stakeholder engagement	Ability to identify and engage with stakeholders including the ability to listen and understand needs, build relationships and integrate in networks	X		X	X	X			X
Strategic thinking and acting	Ability to think and act strategically, including the ability to excogitate and formulate a strategy including its main objectives, plans and actions; making decisions on the spot without losing sight of long-term strategic objectives	X	X		X	X	X	X	X
Systems-thinking	Ability to understand and evaluate systemic relationships and cope with inherent complexity	X		X	X	X		X	X
Transformational leadership	Ability to inspire and motivate others to contribute to sustainable development	X	X						X
Trust building	Being trustworthy and able to building mutual trust in relationships				X				X
Values-thinking	Ability to perceive, analyze, reconcile, and negotiate values, norms, principles, and objectives		X		X	X	X	X	X

Furthermore, we trained five employees from Eco-Conseil to act as facilitators during the workshop. All facilitators are experts in the field of sustainability and work as lecturers in the training programs of Eco-Conseil. They have an advanced understanding of competencies. The facilitators were embedded in smaller workgroups with 4–5 sustainability professionals during the first stages of the workshop. They were tasked with assisting the workgroups during assignments and discussions. Furthermore, they were instructed to write down observations and to take detailed minutes during the plenary discussions which enriched our data collection. By integrating these experts into our research design, we were able to add a second layer to the action-reflection cycles. This strengthened the reliability of our findings. Participant information (such as names, affiliation, and project details) is kept anonymous, because the vast majority of the participants is highly recognizable in Belgium (Wallonia) and would be easy to identify. Guaranteeing anonymity enabled open communication and helped to build mutual trust which is of great importance in action research (Altrichter et al., 2002; Lennie, 2006).

## Second stage: interactive workshop

Two weeks before the workshop, we e-mailed a preparation assignment to the participants. The assignment assisted them in recalling important events and experiences (including obstacles and bottlenecks) and asked them to reflect and elaborate on knowledge, skills, and attitudes related to their work as sustainability professionals (see Appendix Figure A1 for examples). The assignment was the first action-reflection cycle and preparation for an interactive workshop which took place in March 2022. It was led and facilitated by a French-speaking member of the research team. The other two researchers conducted administrative tasks and took field notes. The workshop was designed as a hermeneutic process of divergence and convergence for joint knowledge construction between participants (Perez Salgado et al., 2018; Venn et al., 2022). It lasted 4h and was structured in four major phases. (1) Introduction phase: welcome; presentation of research aim and methodology; clarification of rules, roles, and responsibilities; asking consent for this research and the publication of findings. (2) Divergence phase (in groups of 3–5 people): sharing important events and experiences (including obstacles and bottlenecks); elaboration on knowledge, skills, and attitudes; summarizing insights on flip-over charts. (3) Convergence phase (plenary): presentation of flip-over charts; Q&A for clarification. (4) Plenary discussion about the most important and most relevant competencies for sustainable development; drawing preliminary conclusions (end of convergence phase); outlook and next steps. The output of the workshop (flip-over charts) was photographed and transcribed for further analysis (see Appendix Figure A2 for examples). Furthermore, the five facilitators and the members of the research team took field notes to document their observations. The workshop was the second action-reflection cycle of this study. All field notes and minutes were transcribed for further analysis. After the workshop we had two focus-group sessions with the facilitators. The first was a week after the workshop to reflect on their observations and experiences. The second session took place after our data analysis to prevent misinterpretations of findings.

## Third stage: data analysis and focus group discussion

The interactive workshop produced a substantial amount of qualitative data which was captured on hand-written flip-over charts, minutes of the plenary discussion, and field notes by the facilitators and researchers. After the workshop we recorded all data in digital text files which enhances reliability of the following analyses (Lennie, 2006). Next, we used a common back-and-forth technique to translate all data into English. In total, 478 empirical observations were translated and stored in a digital database for further analysis. Next, we used open, axial, and selective coding procedures to derive theoretical concepts from raw data (Corbin and Strauss, 2014; Glaser and Strauss, 1967) which is a common approach in action research (Dick, 2007; Sankaran and Dick, 2015). For the first stage of the coding process we used two different techniques to analyze the data. One researcher used an *in vivo* technique to conduct an explorative analysis (Corbin and Strauss, 2014; Glaser and Strauss, 1967) whereas a second researcher analyzed the data with a fixed *a-priori* framework (Eisenhardt, 1989) that was derived from relevant literature (see Table 1). Both analyses were done simultaneously and completely independent from each other. Afterwards similarities and differences were discussed by the entire research team. This approach allows for methodological triangulation which strengthens reliability of the analysis (Lennie, 2006). The discussion revealed that the theory based *a-priori* framework provided a sufficiently detailed coding scheme to analyze the data. The *in vivo* coding resembled the *a-priori* scheme to a great extent, which demonstrates a high degree of robustness of our analysis. Naturally, codes were not literally the same, but often resembled the same meaning by having similar descriptions and were used to identify similar content. For example, during *in vivo* coding the code label ‘imagine’ was used to mark empirical data that described creativity and imagination of the sustainability professional. The researcher that applied the *a-priori* framework marked the same data with the code ‘creative thinking’ (see Table 1). After comparison and discussion, the research team concluded that both codes resembled the same content and continued with the code ‘creative thinking.’ Overall, 369 codings (77.2% of all data) resembled the same meaning and were used to identify the same content. However, the *a-priori* scheme sometimes fell short in providing adequate categories so that data had to be coded as “other information.” The *in vivo* coding does not have this shortcoming, since new codes are developed on the spot. Thereby, the *in vivo* codes helped us to capture information that did not fit into existing theory. The comparison between the different analytical approaches revealed substantial differences in 109 cases (22.8% of all data). After intensive discussion, the research team concluded that for 49 codings (10.3% of all data) the *a-priori* code showed a better fit with the empirical data and for 25 codings (5.2% of all data) the *in vivo* codes were more adequate. In 35 cases (7.3% of all data) neither the *a-priori* nor the *in vivo* codes were kept and a new code was assigned. Overall, the 478 empirical observations from the workshop were coded with 45 distinct codes which were clustered into 19 categories during the axial and selective coding stages. Methodological triangulation forced the research team to build up a deep understanding of the data and to provide defensible evidence for each coding. Although this procedure is costly and extremely time consuming, it strengthens rigor and reliability of the data analysis (Lennie, 2006). After the data analysis, we presented and discussed the coding procedure and preliminary findings with the focus group to ensure contextual embeddedness and to minimize the risk of

TABLE 2 Characteristics of the participating sustainability professionals.

Characteristics		Number (percentage)
Gender	Female	11 (61%)
	Male	7 (39%)
Highest education completed	Bachelor	4 (22%)
	Master	11 (61%)
	PhD	3 (17%)
Work experience	5–9 years	2 (11%)
	10–19 years	2 (11%)
	20–29 years	7 (39%)
	30+ years	7 (39%)
Average work experience	24 years	
Average work experience as sustainability professional	17 years	
Job titles	Project manager	4 (22%)
	Sustainability Officer	10 (56%)
	Head of division	2 (11%)
	Director/general secretary	2 (11%)

false interpretations. This marks the end of the third action-reflection cycle.

#### Fourth stage: participant feedback and approval

Based on the data analysis and focus group discussions we summarized our findings in a report which was emailed to all participants of the workshop. The report presented all identified competencies, including a graphical representation, definitions of competencies, and descriptions of underlying relationships between competencies. We asked the sustainability professionals to elaborate on all findings and to provide comments. In August 2022 the report was sent by e-mail to the participants. They approved the competency model and all its elements. Six participants provided suggestions and clarifications, which led to some adjustments of the graphical representation of the competency model. Furthermore, we added a deeper discussion to the intrapreneurial and political competencies to provide a more differentiated picture. This step completed the fourth action-reflection cycle of our empirical study. Due to the great approval by the participants we were confident that no significant learning could be yielded from another action-reflection iteration. This marks the end of the 'self-reflective spiral' in action research (Checkland and Holwell, 1998). The following section will now present the final competency model that has emerged from this action research.

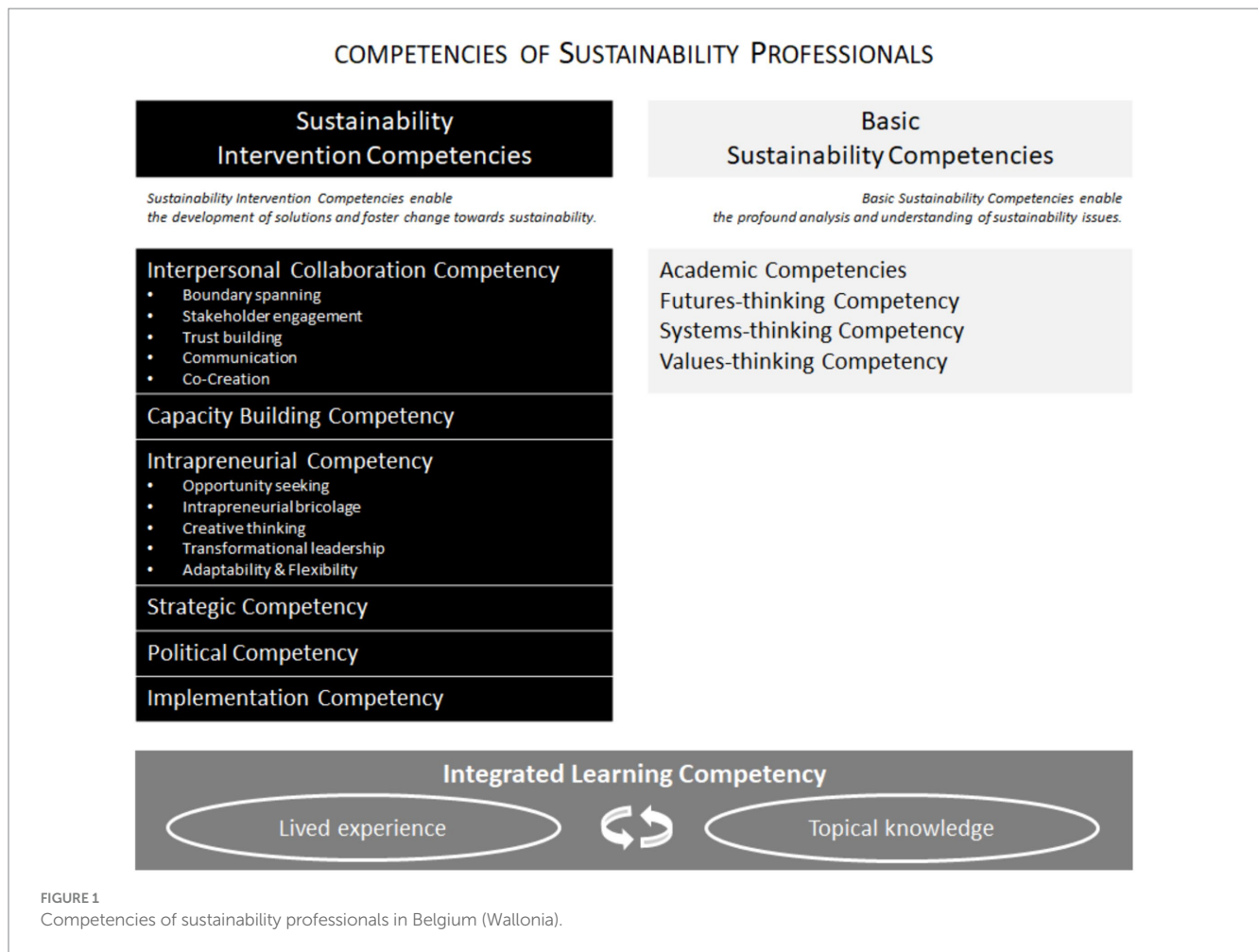
## Results

This section lays out the empirical findings on key competencies of sustainability professionals. Figure 1 displays the competency model which was validated by the experienced sustainability professionals from Belgium (Wallonia).

### Basic sustainability competencies

The right-hand side of Figure 1 displays a cluster of competencies which are needed to analyze and understand complex sustainability challenges. They include, academic competencies, futures-thinking, systems-thinking, and values-thinking. First, *academic competencies* are mainly described as critical-thinking, analytical-thinking, as well as processing and presenting information. Participants indicate that their daily work requires a fair amount of questioning the status quo. They need to collect and evaluate information in a systematic manner as these raw data examples stress: "The methodology of our approach makes us competent...you have to be a systemic analyst...analyze - in the field - brakes, levers, actors, etc. ...get information...find experts." Second, *systems-thinking* is crucial in gaining a sound understanding of sustainability challenges. The professionals mention the need to analyze and understand systemic relationships as well as the necessity to cope with the inherent complexity of social, political, and ecological systems. Third, *futures-thinking* can be defined as the ability to use one's imagination to picture future developments including a capacity to comprehend their possibility, probability, and desirability. Thinking in future scenarios demands to anticipate possible consequences of action and reaction in complex systems (see Figure 1).

Fourth, *values-thinking* can be defined as the ability to perceive, analyze, reconcile, and negotiate values, norms, principles, and objectives. The professionals outline the importance of self-awareness to analyze and understand values and norms of others. Values-thinking helps to understand sustainability issues which are notoriously 'wicked' (Weber and Khademian, 2008) and demand complex multistakeholder collaboration (Waddock, 1988). Overall, the four competencies of this cluster account for 6.5% of all data, which is a rather small volume. In qualitative research one needs to be careful when interpreting volumes. For example, a code that has been assigned just a couple of times does not necessarily mean that it is of lesser significance than a code that has been assigned hundreds of times. It might simply be the case that participants quickly agree on



a matter which produces only a small amount of data. Therefore one needs to take a closer look at the context in which the information is embedded. For this purpose, we draw on the extensive field notes and the observations by the workshop facilitators.

It is fair to say that the whole competency cluster only emerged due to our comprehensive data analysis and could have been overlooked easily. We found good evidence for values-thinking which was mentioned 23 times (4.8% of all data). However, academic competencies (3 times), systems-thinking (3 times), and futures-thinking (2 times) together only represent 1.6% of all data which mirrors the length and depth of the discussion during the workshop. Observations of the research team and the facilitators both confirm that this competency cluster was clearly not at the heart of the elaborations during the workshop. So the question arises: Why are futures-thinking, systems-thinking, and academic competencies not mentioned on a broader scale? We used the fourth action reflection cycle to discuss this finding with the participants. Their feedback is that these competencies are still relevant for their work, but have a more basic nature. A sustainability professional who is not capable of applying systems-or futures-thinking to a sufficient degree would simply not be able to do the job. They are required to function as a professional, but the participants strongly emphasize that intervention related competencies are of much greater importance for success in the workplace. We labeled this cluster with Basic Sustainability Competencies to account for these findings (see Figure 1).

## Sustainability intervention competencies

The left-hand side of Figure 1 displays a competency cluster which was deemed crucial to the success in real-life settings by the experienced participants of this study. Together these competencies account for 74.1% of the workshop data. Intervention competencies enable the co-creation of solutions to sustainability challenges together with stakeholders and to help to foster self-sustaining transitions toward sustainability. Sustainability intervention competencies include six interrelated competencies, namely interpersonal collaboration, capacity building, an intrapreneurial competency, a strategic competency, a political competency, and an implementation competency.

## Interpersonal collaboration competency

Encompasses the sustainability professional's ability to collaborate in multi-stakeholder settings productively. This competency is complex and lies at the heart of the intervention competencies and was mentioned 130 times during the workshop (27.2% of all data) which exceeds all other competencies by far. The participants strongly emphasize that collaboration with stakeholders is key to achieve transitions toward a more sustainable future. The data analysis revealed five factors, namely communication, co-creation, stakeholder engagement, trust building, and boundary spanning. The raw data



underscores that sustainability professionals need to... *“bring together diverse actors and constitute a group... alone, we are nothing... start by identifying the needs, even the hidden needs, of stakeholder... create a climate of trust.”* The experienced sustainability professionals from Belgium (Wallonia) made it clear that one needs to master interpersonal collaboration in order to make a meaningful contribution to sustainability.

## Capacity building competency

Capacity building competency is the ability to develop and strengthen resources and capabilities of stakeholders so that these stakeholders are enabled and empowered to contribute to sustainable development. Often, capacity building is about knowledge diffusion and competency development, but it can also be about the provision of other resources, such as money, time, or space. The participants of this study emphasized during the workshop that one needs a helping mindset for capacity building. They described it in French with *‘bienveillance’* which translates as benevolence, kindness or graciousness. *“Kindness...willing to help...coach...taking care... build capacity to act... being altruistic”* are some of the raw data examples from the workshop. Furthermore they outline the need to be credible role models and to stimulate stakeholders to take responsibility. Building capacity is of great importance so that projects become self-sustaining and thereby independent from the sustainability professional: *“train other people to disseminate [solutions]... transmit skills and approaches... train ambassadors... empower and make [them] responsible and capable... give responsibility.”* This competency appeared 48 times in the workshop data (10% of all data).

## Intrapreneurial competency

Intrapreneurial competency can be defined as the ability of a sustainability professional to stand up, assume ownership and behave as an entrepreneur within an existing organization. Five elements surfaced during this research, namely opportunity seeking, intrapreneurial bricolage, creative thinking, adaptability, and transformational leadership. We found strong empirical evidence for an intrapreneurial competency. It appeared 78 times in the workshop data (16.3% of all data). For example, the professionals describe that they encounter situations where they do not have enough budget, time, and manpower. However, that does not necessarily put an end to their projects: *“if you have restrictions or not enough budget—with a little creativity—you can always start something.”* The professionals describe how they juggle scarce resources and try to come up with smart and creative solutions (intrapreneurial bricolage). Furthermore, they emphasize that it is important to seek opportunities, to take small steps, and to strive for feasible goals without losing sight of the greater mission. The professionals describe themselves as a ‘Swiss army knife’ and ‘specialized generalist,’ because they need to be able to cope with many different challenges. They need to adapt to situations quickly and inspire others by spreading their passion for sustainable development (transformational leadership). *“Do not hesitate to shake up and break hierarchy!”*. This quote from the workshop shows that

sustainability professionals must become true pioneers within their organization to foster change.

However, the plenary discussion during the workshop also revealed that the professionals clearly do not see themselves as ‘traditional commercial entrepreneurs.’ First and foremost, all of the participants of this study work in an existing organization and do not desire to start their own company. As an employee they do not always have the freedom to take decisions alone. Hierarchy plays an important role within existing organizations which can narrow their room for experimentation and innovation. Second, although most participants agree that sustainability projects should become financially sustainable, many reject excessive profit-maximization. Clearly these are important distinctions from traditional commercial entrepreneurship. Hence, we need to underline the ‘intra’ in intrapreneurship and put strong emphasis on sustainable value creation when it comes to sustainability professionals. Overall, we found strong evidence for a competency in sustainable intrapreneurship. It consists of five elements, namely opportunity seeking, intrapreneurial bricolage, creative thinking, adaptability, and transformational leadership. Next, strategic and political competencies will be discussed together, because they are connected to each other.

## Strategic competency

Strategic competency describes the ability to excogitate, formulate, and execute a strategy including the deduction of objectives, priorities, and milestones. Being a sustainability professional requires decisive decision-making skills and the flexibility to adapt without losing sight of the bigger picture. This competency appeared 38 times (8% of all data). Some examples from the raw data are: *“[We need] patience and perseverance...take small steps in a big project... long-term continuity... sometimes it is necessary to remain in the shadows.”* These quotes document that sustainability professionals make tactical choices based on clear strategy. The ultimate strategic objective is never forgotten, even if they have to take a detour, patiently wait, or stall. During the discussions one of the participants eloquently summarized: *“You have to know how to leave the building through the door and enter again through the window!”* This quote also shows how strongly the strategic capabilities are linked to political ones.

## Political competency

Political competency is the ability to engage in political thinking, and find ways to get stakeholders on your side. Political sensitivity is necessary to anticipate politics and power play between stakeholders. The participants outline that they need to be aware of hidden agendas, to consider political motives, and to take electoral cycles into account. Overall, the political competency appeared 19 times in the workshop data (4.0% of all data) and documents that sustainability professionals need awareness of power play and the capacity to anticipate and respond to it: *“It is necessary to know the elected [officials], to know their hidden agendas, to be able to provide them with results which can be profitable to them ... we need political knowledge and human knowledge... but we have our own hidden agenda too... our own values of trying to save the environment are very strong!”*

However, during the action-reflection cycles, some participants also revealed their discomfort with this aspect of their work. Playing politics seems to have a negative connotation or stereotype. It is something that powerful stakeholders do and because of that they reluctantly adapt to it. Although they need to anticipate political motivations and see through hidden agendas, they draw a clear line between their profession and the political arena. Nevertheless, this competency is about political sensitivity and political actions. Both aspects—thinking and acting—are crucial for success. This leads us to the last intervention competency, namely the ability to implement solutions.

## Implementation competency

Implementation competency can be defined as the ability and motivation to initiate, facilitate, and accomplish change toward sustainability including the ability to gain support and dissolve resistance of stakeholders. It includes aspects known from change management theory, such as clear communication, dealing with fear and resistance, acquiring influential sponsors, and to build up internal and external support. The following quotes from the raw data outline the capacity to act and to facilitate change: *“Be solution-oriented and put things into action... popularization—adapt to public ... never rest on laurels... political commitment and support are catalysts...gain individual and collective support...boost political support...facilitate!”* In total, the implementation competency appeared 39 times in the workshop (8.2% of all data) and was consistently confirmed during the third and fourth action-reflection cycles.

Different aspects of this competency are linked to other intervention competencies. For example, gaining internal and external support often requires skills from the political and strategy competencies. The participants also mention that they face serious resource constraints such as limited time, manpower and insufficient budgets during implementation processes. The ability to overcome these constraints is a crucial part of the intrapreneurial competency (see intrapreneurial bricolage). Overall, co-creation of innovative solutions together with stakeholders and the facilitation of transition toward sustainability are key to success in their field of work. Sustainability Intervention Competencies are important for becoming a successful sustainability professional (see also Figure 1).

## Integrated learning

Integrated learning is the last competency mentioned by the participants. Integrated learning (17 times mentioned) is a process where theoretical and practical knowledge evolve in a learning process through action in the field. Social learning processes play a key role. Learning from success and failure of others was combined with a strong call to share best practices in their community. Furthermore, the participants of this study outline that they try to inspire others by being a role model and by building the capacity of stakeholders. Both are indicators of social learning. During the workshop, the professionals emphasize the importance of being curious and open to learning opportunities as well as the need to stay on top of developments in science and society. Integrated learning binds two

complementary forms of knowledge together, namely topical knowledge and lived experience.

## Topical knowledge

Topical knowledge (36 times mentioned) in the context of sustainability can be defined as (scientific) knowledge that is related to a certain sustainability topic (e.g., climate change or technical knowledge for environmental analysis). Topical knowledge is usually developed through formal education and vocational training, but can be self-taught as well.

## Lived experience

Lived experience (35 times mentioned) is knowledge that evolves over time through everyday practice on the field, engagement with others, experience and responses to events influenced by contextual factors. Lived experience is practical knowledge about ‘what works in real life situations.’ Figure 1 displays this cluster at the bottom and uses ellipses to indicate that topical knowledge and lived experience are forms of knowledge rather than competencies. The Integrated Learning cluster accounts for 18.4% of the workshop data. Overall, this analysis provides empirical evidence for 11 key competencies of sustainability professionals. The next chapter will discuss findings and compare results with other empirical research (pattern matching).

## Discussion of findings

This study collected and analyzed qualitative data from senior sustainability professionals who operate in the French and German speaking part of Belgium (Wallonia). The participants of this study have on average 24 years of work experience out of which 17 years in the field of sustainability. Our data contains dynamic aspects due to the evolutionary character of the research methodology. The rigorous iterative approach increases validity of findings within their scope, but one has to be careful about generalizability. This is a common limitation in qualitative research. One way of dealing with this issue is pattern matching (Denzin and Lincoln, 1994; Eisenhardt, 1989; Gibbert et al., 2008) which we will do in this section. Pattern matching requires to compare findings with results of similar empirical research to outline similarities and differences. This study found empirical evidence for three competency clusters, namely Sustainability Intervention Competencies, Basic Sustainability Competencies, and Integrated Learning.

## Sustainability intervention competencies

Sustainability intervention competencies enable sustainability professionals to devise solutions together with stakeholders and to foster change toward sustainability. Throughout the entire action research process the experienced professionals strongly emphasized the need to master multistakeholder collaboration. *Interpersonal collaboration* lies at the heart of the intervention competencies. It has

previously been identified as a key competency by educational experts (Brundiens et al., 2020; Konrad et al., 2021; Rieckmann, 2012; Wiek et al., 2011), alumni of sustainability programs (Hesselbarth and Schaltegger, 2014; MacDonald and Shriberg, 2016; Salovaara and Soini, 2021), and sustainability professionals (Mabon and Shih, 2021; MacDonald et al., 2020; Perez Salgado et al., 2018; Venn et al., 2022; Willard et al., 2010). Our findings are in line with Salovaara & Soini (2021, p. 79) who document that sustainability professionals in Finland put strong “emphasis on collaboration.”

Additionally, this study indicates that interpersonal collaboration consists of several elements which have been found in other studies as well. For example, the ability to build mutual trust between stakeholders (Perez Salgado et al., 2018; Venn et al., 2022). This does not come as a surprise, because trust has been outlined as an important governance mechanism in cross-sector partnerships that strive for sustainable development (Barroso-Méndez et al., 2016; Venn and Berg, 2014). Our research also identifies boundary spanning as another important element of interpersonal collaboration. This is in line with higher education literature which calls to integrate a transboundary competence into sustainability related study programs (Cavicchi, 2021) as well as empirical research with sustainability professionals from the Dutch speaking part of Belgium (Venn et al., 2022). However, not every stakeholder might have the resources to participate in collaboration. Our findings indicate that sustainability professionals spend significant time and effort on *capacity building*, which becomes one of their key competencies. The importance of capacity building for sustainable development has been mentioned in higher education literature (Ho et al., 2023; Klinsky and Sagar, 2022; UNAI, 2023) as well as by research on competencies of professionals (Mabon and Shih, 2021; MacDonald et al., 2020; Venn et al., 2022). Our findings suggest that capacity building is linked to interpersonal collaboration competency.

An *entrepreneurial competency* is a novel aspect of key competencies needed in the context of sustainability, but has also been documented by empirical research with alumni of sustainability programs as well as experienced sustainability professionals (Hesselbarth and Schaltegger, 2014; Salovaara and Soini, 2021; Venn et al., 2022). However, the participants of this study put strong emphasis on two important aspects. First, all of them operate in an existing organization which makes them intrapreneurs rather than entrepreneurs. Second, they outline contribution to sustainable development as their most important objective. Participants provided feedback that they reject excessive profit-maximization and that they want to create sustainable value instead. This means that we have to specify this competency even further and define it as *sustainable intrapreneurship*.

Additionally, this paper provides a more detailed picture of five elements, namely opportunity seeking, intrapreneurial bricolage, creative thinking, adaptability, and transformational leadership (see Figure 1). The participants of this research identified resource restrictions, such as limited time, manpower, and budget, as important obstacles to achieve transitions toward sustainability. It seems plausible that the intrapreneurial capacity is a direct response to these limitations for several reasons. First, sustainability professionals demonstrate their proactiveness, focus on feasibility, and opportunity recognition capacities. Although they are often visionaries, they are definitely not dreamers. They actively search

for quick-wins without losing sight of strategic objectives. Actively ceasing opportunities might help to keep stakeholders involved and attract additional sponsors. *Opportunity recognition* has been outlined by management literature as one of the important dimensions of intrapreneurship (Neesen et al., 2019). A recent study with sustainability professionals from the Flanders region of Belgium also presented empirical evidence for an intrapreneurial competence (Venn et al., 2022). Second, we find many indications of intrapreneurial bricolage, which can be defined as the ability to work with resources at hand to cope with resource constrains. This finding is in line with Venn et al. (2022) and earlier case study research on sustainability managers in multinational corporations, such as ABB, Nokia, and Philips (Halme et al., 2012; Venn and Berg, 2013). Overall, sustainable intrapreneurship is a relatively new notion, but presents itself as an integral part of key competencies of sustainability professionals.

### Political and strategic competencies

Political and strategic competencies are closely linked to one another which has been documented by earlier empirical research on competencies of sustainability professionals (Perez Salgado et al., 2018; Venn et al., 2022). Furthermore, the need for political thinking has been mentioned in higher education literature (Runhaar et al., 2005; Wiek et al., 2011). We acknowledge that most participants of this study currently work in the public domain which might make them more sensitive to political issues. However, management research on multi-stakeholder collaboration in cross-sector partnerships has also shown the potential for conflict and power play due to asymmetric resource positions of stakeholders (Babiak and Thibault, 2009; Seitanidi, 2010; Venn and Berg, 2014). Perez Salgado et al. (2018, p. 173) outline that “no stakeholder has absolute power to dictate proceedings and that significant time is needed to negotiate the power relations which are at play between stakeholders.” Earlier research argues that the ability of political-strategic thinking and acting should be a crucial aspect of intervention competencies (Perez Salgado et al., 2018; Venn et al., 2022). Strategic-thinking is frequently mentioned in higher education literature as an important component of sustainability related competency models (Brundiens et al., 2020; Curtis et al., 2021; Wiek et al., 2011). Our findings show that strategic and political competencies are separate competencies even though they are linked together, but future research should gather more data to investigate this issue further.

### Implementation competency

Implementation competency can be defined as the ability to initiate and facilitate a process of change toward sustainability. It includes a strong motivation to act, conflict resolution, gaining support inside and outside the organization, and coping with resistance. Willard et al.'s (2010) survey amongst sustainability professionals in North America (mainly in the USA) documents the need for sophisticated change management skills. The ability of ‘getting things done’ (Mabon and Shih, 2021; MacDonald et al., 2020) and to implement co-created solutions (Perez Salgado et al., 2018; Venn et al., 2022) has been documented by several empirical studies with sustainability professionals. Even educational experts started to acknowledge that the capacity to implement solutions should be a crucial part of competency frameworks for students (cf. Brundiens

et al., 2020). Our findings are in line with Venn et al. (2022) who have shown that sustainability professionals often strive for self-sustaining change. Sustainability professionals build up capacity of stakeholders and “are willing to sacrifice personal fame if that helps to achieve transformation toward sustainability” (Venn et al., 2022, p. 11). This underlines that complex implementation requires collaboration and the need to enable others to pursue implementation. Thereby the implementation competency is linked to interpersonal collaboration and capacity building.

## Basic sustainability competencies

Basic sustainability competencies constitute the second competency cluster (see Figure 1), which includes academic competencies, futures-thinking, systems-thinking, and values-thinking competencies. It is interesting to note that these competencies are well established in higher education literature (cf. Brundiers et al., 2020; Lambrechts et al., 2013; Wiek et al., 2011). They play a dominant role in the European sustainability competency framework (Bianchi et al., 2022) and UNESCO’s key competencies for sustainability (UNESCO, 2017). However, our findings clearly show that these competencies are of minor importance to experienced practitioners when compared to more practical ones. This is in line with MacDonald and Shriberg (2016, p. 369), who documented that alumni of sustainability leadership programs “have a strong preference for skills with direct translation into the workplace as opposed to more internally focused processes that can be difficult to bring into professional settings directly.” It is interesting to mention that similar differences have also surfaced in other empirical research with sustainability professionals (cf. MacDonald et al., 2020; Venn et al., 2022). Basic Sustainability Competencies only account for 6.5% of the data, which is a strong indication of the depth and length of the discussions during the workshop. When asked to identify their key competencies the sustainability professionals did not elaborate much on these competencies. They were barely mentioned and surfaced only because of our comprehensive data analysis. The extensive observations by five facilitators and three researchers backs up the conclusions that these competencies are basic requirements to function as a sustainability professionals, but do not contribute much when it comes to achieving transitions toward a more sustainable future.

Academic competencies (such as critical and analytical thinking), futures-thinking, systems-thinking, and values-thinking are needed to gain a sound understanding of the highly complex challenges in the field of sustainability. This might be more important for students and young professionals than for more seasoned practitioners. The participants of this research had on average 24 years of work experience out of which 17 years as sustainability professionals. They were selected based on their contributions and success in the field of sustainable development in Belgium (Wallonia). They underscore the importance of Sustainability Intervention Competencies when it comes to success in the workplace. This is in line with earlier empirical research (Perez Salgado et al., 2018; Venn et al., 2022). Research on competencies of sustainability professionals is still in its early stages and future research might want to explore this divergence in greater depth.

## Integrated learning

Integrated learning is the last competency cluster that surfaced during this study. The need for continuous learning has been outlined in earlier empirical research (Hesselbarth and Schaltegger, 2014; Holtz et al., 2018; MacDonald et al., 2019; Perez Salgado et al., 2018; Venn et al., 2022) but little has been said about the underlying reasons. Clearly, there is a need for continuous learning for professionals in general, but sustainability professionals operate in a field that is evolving rapidly. The participants of this research made it clear that they have to keep up with (scientific) literature. They read the newest reports on sustainability issues and stay on top of technological and societal developments. Furthermore, sustainability issues are highly complex and often pose ‘wicked’ problems (Rittel and Webber, 1973). Developing solutions regularly spans far beyond the capacity of any single person, organization, or sector (Waddock, 1988). Hence, sustainability professionals extensively engage in multi-stakeholder collaboration which exposes them to situated knowledge (Haraway, 1988) and situated learning (Lave and Wenger, 1991) in communities of practice (Wenger, 2000). This indicates that social learning processes (Bandura, 1971) play a key role in the acquisition and diffusion of knowledge (capacity building). This is in line with higher education literature (de Haan, 2006, 2010) and research that outlines social learning as a key driver to create a joint vision, shared expectations, and interest alignment in multistakeholder collaboration (Holtz et al., 2018). On the one hand, constant exposure to new perspectives and new knowledge provides relentless learning opportunities. On the other hand, learning might be mandatory to reduce large ‘cognitive distance’ between stakeholders simply to understand each other (Nooteboom, 2000, 2010). Overall, it might be a combination of learning opportunity and learning necessity that explains the relevance of Integrated Learning for sustainability professionals. Nevertheless, it is still worth reminding that this holds even for seasoned practitioners with decades of work experience. The need for continuous learning has been documented by other empirical research (Perez Salgado et al., 2018; Venn et al., 2022; Willard et al., 2010) and should be included in competency frameworks for sustainability professionals.

## Conclusion

This study provides a better understanding of key competencies of experienced sustainability professionals. The participants of this study had on average 24 years of work experience out of which 17 years in the field of sustainability. We have used a rigorous action research approach with four action-reflection interactions to derive insights. Data was collected through a preparation assignment, a workshop, observations, focus group discussions, and written feedback. We used reliable techniques for qualitative data analysis and triangulation. This chapter presents key findings, implications, limitations and a proposal for future research.

## Key findings

This study provides several novel insights. First, we found strong empirical evidence for the importance of Sustainability

Intervention Competencies which enable sustainability professionals to co-create and implement interventions toward a more sustainable future. Sustainability Intervention Competencies consist of six key competencies, namely interpersonal collaboration competency, capacity building competency, intrapreneurial competency, strategic competency, political competency, and implementation competency. Sustainability professionals with substantial work experience emphasize that success in the workplace will be hard to achieve without these competencies. Second, this study identifies a set of basic sustainability competencies, namely academic competencies, futures-thinking, systems-thinking, and values-thinking. These competencies enable the profound analysis and understanding of sustainability issues. Findings indicate that these competencies are needed to meet the basic requirements to do the job, but are of minor importance to experienced sustainability professionals. Third, the empirical evidence shows that sustainability professionals keep on learning throughout their entire career. Even sustainability professionals with decades of experience articulate their need for constant development. An integrated learning competency binds topical knowledge and lived experience (practical knowledge) together. Although being complementary forms of knowledge rather than competencies, they should be included in competency frameworks. Finally, participants of this study have not only identified and discussed key competencies, but also corroborated a coherent model. The graphical representation displays 11 key competencies of sustainability professionals which can be grouped into three general clusters (see [Figure 1](#)).

## Implications and recommendations

Empirical research on key competencies of sustainability professionals is gaining momentum in the field of Sustainability Science. Our study contributes to this field by providing a comprehensive overview of competencies that are needed to foster sustainable development. We have shown that sustainability professionals put strong emphasis on competencies that focus on the development and implementation of solutions. Sustainability Intervention Competencies should be at the heart of vocational training programs and certification systems. A sound understanding of key competencies can also help to improve existing practices in Human Resource Management. Recruitment, assessment, team development, leadership, and incentive systems should be critically evaluated and adjusted. Insights on key competencies have wide applications, since sustainability professionals work in all kinds of organizations in the private, public, and civil sector. We recommend that HRM critically evaluates existing tools and adopts a competence based view when it comes to recruiting, promoting, and training of sustainability professionals.

This study presents novel insights on the importance of a competency in *sustainable intrapreneurship*. Management sciences could benefit from more research on the distinct nature of this phenomenon. This study documents that sustainability professionals apply intrapreneurial bricolage to cope with internal resource constraints. This raises the question of lacking organizational support for sustainability professionals. Clearly, sufficient room for experimentation and innovation (white-space) would be beneficial for

sustainability professionals. Furthermore, identifying and nurturing intrapreneurs holds great potential to accelerate transition toward a more sustainable future. We recommend future research to explore sustainable intrapreneurship in greater detail.

There is growing evidence that sustainability professionals put less emphasis on competencies that are internally focused, such as systems-thinking, futures-thinking, or values-thinking. At first glance this seems odd, because these competencies are well-established in higher education and integral aspect of many competency frameworks for students. Whether or not this is a sign of a mismatch between what is taught in school and what is required in real-life or simply a different connotation on a larger scale of sustainability competencies is up to debate. Our findings suggest that basic sustainability competencies are required to gain a deep understanding of sustainability challenges, which will be the foundation of any successful work in the field of sustainability. Nevertheless, experienced professionals suggest that one needs to focus on Sustainability Intervention Competencies if one wants to excel at the job. Therefore we recommend to take this into account by adapting HRM tools to the specific audience.

## Limitations and future research

Common limitations in qualitative research concern internal validity and generalizability of findings. First, we established internal validity by developing a clear research framework, setting fixed selection criteria for participants, and performed several triangulations: (a) we used a assignment (self-reflection), group discussions, plenary discussions, observations (field notes), and focus group discussions for data triangulation; (b) we carried out two different qualitative data analyses simultaneously (*in vivo* coding and *a-priori* coding) for methodological triangulation. In combination with multiple moments for participant feedback throughout the iterative process we are confident that internal validity has been established. Second, this study collected and analyzed qualitative data on senior sustainability professionals who operate in the specific context of the Wallonia region of Belgium. Findings of this study cannot be generalized, which is a common limitation in qualitative research. Nevertheless, based on a transparent selection process and comprehensive pattern matching we can offer some insights beyond the scope of this study. There is a significant overlap with findings from other empirical research. This might indicate that key competencies of experiences sustainability professionals constitute a stable pattern, but future research could use quantitative data to explore this in greater depth. Furthermore, most empirical research on competencies of sustainability professionals has been done in Europe and North America. It would be unwise to claim universality of competencies and ignore the possibility of cultural influences and local embeddedness. More research is needed and we encourage others to conduct (action) research in countries of the Global South.

## Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors upon reasonable request.

## Ethics statement

The studies involving humans were approved by Prof. Dr. Petra C. de Weerd-Nederhof (Dean Faculty of Science). The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

## Author contributions

RV: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Validation, Visualization, Writing – original draft, Writing – review & editing, Software. VV: Data curation, Formal analysis, Investigation, Project administration, Writing – review & editing. PP: Conceptualization, Investigation, Supervision, Validation, Writing – review & editing, Methodology, Formal analysis.

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## Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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# Appendix

Figures A1 and A2.

FIGURE A1  
Examples of the returned preparation assignments (first action-reflection cycle).

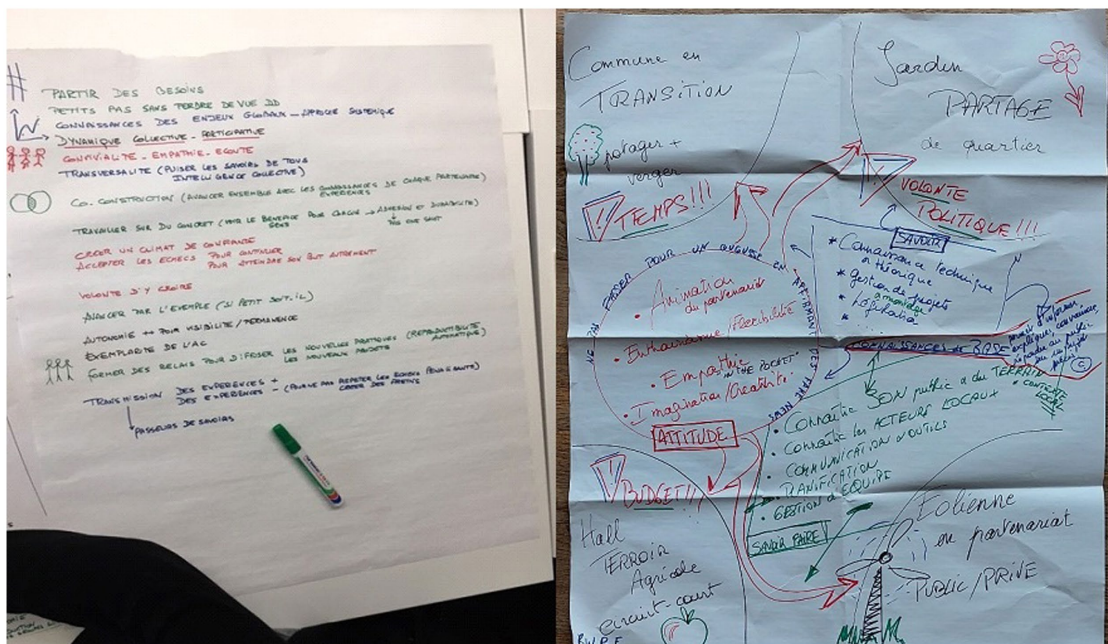


FIGURE A2  
Examples of flip-over charts produced during the group sessions (second action reflection cycle).