



Fostering the incorporation of sustainable development in higher education. Lessons learned from a change management perspective



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ABSTRACT

In research and literature about integration of sustainable development in higher education, particular attention is given towards barriers for change and critical success factors, mainly with a focus on organisational aspects. Implementation models and integration guidelines are defined in order to guide sustainable development integration in higher education at the level of a single higher education institution. These initiatives look at factors that influence the integration process, however seldom from the perspective of change management and the impact of human factors on organisational change. This paper studies higher education from the perspective of organisational change management and, more specifically, focuses on analysing the human factors in this process: resistance, communication, empowerment and involvement, and organisational culture. A conceptual model, which links human factors to the sustainable development integration process, is presented. The model structures and supports the analysis of this integration process in a higher education institution. It is applied in a specific case study of a Belgian university college. The results indicate that the conceptual model helps to get a profound understanding of human related barriers for integrating sustainable development in higher education, as well as to understand the underlying reasons for these barriers and linkages between them in different stages of the integration process. Another main lesson learned is the importance of continuously supporting ambassadors of sustainable development integration in higher education. These and other insights from the case study are valuable for supporting future integration processes in higher education. Next to that, the model supports scholars to study the integration process of sustainable development and gather profound insights on what and why changes happen. This can trigger individual and collective reflexivity on sustainable development in higher education. Future research includes further improvements and application of the model in other cases.

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1. Introduction: integration of sustainable development in higher education

In recent years, a number of initiatives have been taken by higher education institutions (HEIs) to incorporate sustainable development (SD) following a variety of approaches (Lozano et al., 2013a; Hoover and Harder, 2015). Some initiatives focus on defining implementation models at the level of a single university or university program (e.g. Lambrechts et al., 2009; Lukman and Glavic, 2007; Velázquez et al., 2006; Newman, 2012). These

models define guiding principles and stepping-stones towards sustainable higher education. Other initiatives focus on the level of education within a HEI by offering specific courses and programs that integrate or specialize in SD (Hesselbarth and Schaltegger, 2014; Shriberg and Harris, 2012). A third type of initiatives focus on the development and application of sustainability assessment tools in higher education, e.g. Auditing Instrument for Sustainability in Higher Education (AISHE) (Roorda, 2002), Graphical Assessment of Sustainability in Universities (GASU) (Lozano, 2006b; Lozano et al., 2013c), Sustainability Tool for Auditing University Curricula in Higher Education (STAUNCH[®]) (Lozano and Peattie, 2011). Stephens and Graham (2010) emphasize the usefulness of frameworks and models, but they also criticise these models for failing to take into account the processes by which change takes place. The authors thereby indicate a need for a better understanding of the processes of organisational change.

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As most HEIs do not follow structured models or processes to integrate SD, and given the variety of possibilities, Spira et al. (2013) point to the need to downscale implementation models in order to take into account rather incremental achievements of change agents within HEIs. Looking at the implementation process of SD in HE, several perspectives can be identified, depending on the starting point of the process, the initiator, and different influencing factors. Within selected cases from Germany, Barth (2013) identifies three distinctive patterns of implementation processes: student-led change from informal to formal learning; sustainability in campus operations; and sustainability as a unique selling point. Within each pattern, several unique influencing factors can be identified (Barth, 2013).

Other studies focus on and indicate barriers for change and critical success factors, mostly from the viewpoint of the university system (Lambrechts et al., 2009; Lozano, 2006a; Mazhar et al., 2014; Wright and Horst, 2013). Lozano et al. (2013b), based on numerous other authors and publications, describe the barriers for change in higher education as: lack of SD awareness, insecurity and threat to academic credibility from teachers, over-crowded curricula, lack of support, SD considered to have little or no relevance to the course or discipline, uncertainty of the efforts required to engage with and incorporate SD, discipline restricted organisational structures; academic conservatism/traditions that tie universities to old mechanistic mental models. Furthermore, Lozano et al. (2013b, p. 11) state that “university leaders and staff must be empowered to catalyse and implement new paradigms, and ensure that SD becomes the ‘Golden Thread’ throughout the entire university system”. In order to successfully integrate sustainability in higher education, the role of individuals is crucial, yet often overlooked as an important success factor. Hoover and Harder (2015) call for more work on understanding the role of human factors such as individual agency, relationships, institutional cultures and power on campus. Factors influencing the integration of SD in higher education have thus been defined and studied (Lozano, 2006a; Wals, 2010), often describing organisational barriers and factors, but seldom from the perspective of human factors, and omitting (sometimes quick) changes and evolutions, or influences between different barriers (Barth, 2013). The impact of human factors as key factors of success and resistance in organisations can offer interesting insights for higher education, in order to better understand and support the process of SD incorporation. Stephens and Graham (2010) support this view and encourage studies that focus on individual and collective reflexivity on human factors within the integration process of SD in HE.

This paper starts from the need for a better understanding of the process of organisational change towards SD in higher education, as well as a clear call for more profound insights in human factors during this process. The article looks at SD integration into the university system from the perspective of organisational change management and, more specifically, focussing on the human factors in this process. Previous research (Verhulst and Boks, 2012) defined these human factors to have a significant influence on the integration process of sustainability criteria in the product development process of Flemish and Dutch commercial organisations. A conceptual model developed by Verhulst (2012) is presented. It enables one to profoundly study the integration process of SD in an organisation with a focus on four significant clusters of human factors: resistance, communication, empowerment and involvement, and organisational culture. The model offers a structure for data collection and analysis of organisations going through the integration of SD. The model differentiates itself from existing implementation and assessment tools for SD in HEIs in three ways: the presented conceptual model aims at a deep understanding of success factors and obstacles – with a focus on human factors – that

influence the integration of SD in HEIs. It is a model that supports scholars in gathering these insights. It does not aim at directly guiding the integration process of SD in HEIs, even though the insights from using the model can subsequently support the integration process. Secondly, many other existing tools focus on evaluating the integration process by taking a snapshot, whereas the presented model aims to look at the integration process over a longer period to study its evolution, changes in barriers and success factors and how these influence the integration process and each other. A third distinction with existing tools is that this model offers guidance to scholars to deeply submerge themselves into the integration process and the four clusters of human factors to a systemic level that goes beyond a mere description of the separate factors. Other existing tools do include several human factors, but do not look for the underlying explanations and connections between indicated barriers. In this paper, the conceptual model is applied in a case in higher education. This offers the opportunity to study the integration process of SD in the context of higher education from a human perspective, a point of view that has not been taken before. Moreover, it offers the chance to verify the applicability of the conceptual model in an educational context.

An overview of success factors and obstacles for change, with a specific focus on factors related to people – human factors – is presented in a literature review in this paper. This offers insights in success factors and obstacles of SD integration in higher education and from organisational change management literature, and it indicates links between both fields. This review results in the presentation of a conceptual model, which brings together four clusters of human factors and the integration process of SD in an organisation.

The second part of this paper focuses on the case of Leuven University College (KHLeuven), a HEI in Belgium. The case description and analysis follow the structure of the conceptual model. This offers the opportunity to focus on the human factors that occurred during the SD integration process, and how they influenced the process. The case study provides insights on:

- (a) the integration process that has been followed;
- (b) the occurrence of human factors during the integration process of SD in a HEI;
- (c) the impact of these human factors on specific barriers for change in a HEI;
- (d) the interference and evolution of human factors during the integration process.

2. Literature review

Based on a literature review, a description is given of success factors and obstacles in sustainable higher education. It is followed by success factors and obstacles that are related to change processes in organisations, and with a focus on people-related factors. Its aim is to look at the integration of SD as a change process from a new perspective and to bring insights on the process and the factors that influence it. The last part of the review brings the insights from the two fields together.

2.1. Success factors and obstacles in sustainable higher education literature

Within the discourse of SD in higher education, a lot of attention has been given to describe different barriers for the integration of SD in HEIs, as shortly described in the introduction. Table 1 provides an overview of several identified barriers in literature and presents them in three clusters: barriers related to the lack of

Table 1

Barriers for the integration of SD in Higher Education (HE) (based on Lambrechts et al., 2013; Lozano et al., 2013b; Shriberg and Tallent, 2003; Velázquez et al., 2006).

Barriers for the integration of SD in HE	
Related to lack of awareness	<ol style="list-style-type: none"> 1. Lack of interest and involvement of the majority of the students and staff members 2. Lack of support by management and policy makers 3. Lack of professionalisation and training of teachers 4. Lack of policy making in order to promote sustainability 5. Lack of standard definitions and concepts of SD in HE 6. Lack of recognition, change agents for SD are often not taken seriously 7. SD seen as a threat to academic freedom and credibility 8. SD is not seen as relevant to a certain course or discipline
Related to the structure of higher education	<ol style="list-style-type: none"> 9. Conservative disciplinary structure of HEI, barely open to new paradigms 10. Inefficient communication and shared information both top-down and bottom-up 11. Resistance to change by education and research 12. Focus on short-term profit as a result of managerial thinking and policy making in HE 13. Lack of interdisciplinary research as a result of insufficient coordination and cooperation 14. Overcrowded curriculum 15. Focus on content-based learning
Related to the lack of resources	<ol style="list-style-type: none"> 16. Lack of money, SD is not seen as a priority for funding 17. High work pressure and lack of time, the responsible for SD combines this task often with other tasks 18. Lack of access to information, due to absence of measuring instruments or by unwillingness of staff 19. Lack of consistent legislation 20. Lack of qualitative and quantitative performance indicators 21. Technical problems 22. Lack of physical place

awareness, barriers related to the structure of higher education, barriers related to the lack of resources. It shows a “laundry-list-style” of barriers, which are often described in literature, without profound understanding of how these barriers might interfere with each other, influence each other, or change over time. In other words, even though this static list of barriers is important in the context of SD integration, it is not in line with the reality of HEIs, i.e. with sometimes rapidly changing conditions, specific conditions related to organisational culture, etc.

2.2. Human factors in organisational change management literature

Organisational change management is the field in which one studies and manages the process of change within an organisation. It is the management's approach to taking an organisation through the transition from today to a new future state (Hiatt and Creasey, 2003). Many scholars studied factors that influence a change process. These factors can either support or hamper the integration process. Success factors and obstacles are strongly related to each other: one factor can support a change process or approach in a certain situation, whilst this same factor can hamper another change process or approach in different circumstances (de Caluwé and Vermaak, 2006). Therefore, it is more practical to talk about influencing factors. In a literature review by Verhulst (2012), more than sixty different influencing factors were identified. Many of

these factors are related to people - often referred to as the ‘soft side’ (Boks, 2006; IBM, 2008), the intangibles (Adams, 2003) or the ‘human factors’ of change (Verhulst, 2012). A study from IBM (2008) indicates that this ‘soft side’ is the hardest to change, a finding that has also been identified by Struckman and Yammarino (2003).

There is a high consistency on some human factors that are indicated as success factors in organisational change management literature. These are empowerment and the involvement of employees, human commitment to what needs to get implemented, inductive learning, the adaptation of the organisational culture, and clear communication. Empowerment, involvement and communication are mentioned by several scholars (Adams, 2003; Kegan and Lahey, 2001; Lewis et al., 2006), whereas in a study of IBM (2008) the human commitment to what needs to be changed gets emphasised. Hiatt and Creasey (2003) confirm the importance of engagement, especially within the change team. Kotter (1995) states that the more people get involved, the better the outcome of the change will be, under the condition that the actions performed by the people fit within the broad parameters of the overall vision on the change.

Many scholars and practitioners directly link failures of a change process with resistance to change (e.g. Kotter and Schlesinger, 2008; Smith, 2005; Pardo del Val and Martínéz Fuentez, 2003). Belliveau et al. (2004) describe that the challenge during implementation is to overcome resistance, because whenever there is change, there is also some force pushing in the opposite direction. Schein (1988) described resistance as “the enemy of change, the foe which must be overcome if a change effort is to be successful”. Other authors however consider resistance as a source of information that can be used to support the change process (Waddell and Sohal, 1998). In their article, Cunha et al. (2013) reframe resistance to change and use it as a starting point for improvisation in the change process. Understanding why and how opposition to change occurs, and developing the ability to respond effectively to manifestations of resistance to change, is crucial to the success or failure of efforts to achieve organisational change (Smith, 2005). Resistance as a phenomenon is considered as the most important obstacle in organisational change management, whereby it forms a key element of the study of organisational change.

2.3. Organisational change management and sustainability

Several authors in the field of organisational change management studied and described a change process towards sustainability, both in businesses as well as in the field of higher education (e.g. Newman, 2012). Knowledge from organisational change and change management thereby gets applied in the case of environmental and social issues, which form the subject of change. Senge et al. (2008), for example, use the ideas of systems thinking and learning capabilities for systemic change, whereby the idea behind these ‘living systems’ and how to understand them is translated in the specific case of sustainability issues. Doppelt (2003) describes an organisation as a whole consisting of two or more parts, whereby the way people and structures interact, shape the performance of an organisation. Newman (2012) applies the knowledge on organisational change management to present an organisational change management framework for sustainability on campus, based on the case of Yale University. Wiesner, Chadee and Best (2011) present another framework for SMEs that includes a four-stage process that focuses on managing the SD change process from the perspective of a learning organisation.

When resistance is considered in the case of change toward sustainability, one of the factors that come forward is the ambiguity

and complexity of the concept of sustainability, which leads to a lack of shared understanding and common language (Sylvestre et al., 2013). However, several scholars indicate that most of the barriers that occur during the implementation of sustainability are not unique to sustainability problems, but rather obstacles which affect an organisation's capacity to deal with any form of change, including environmental and social change (Doppelt, 2003; Dunphy et al., 2007; Post and Altman, 1994; Stone, 2006). Doppelt (2003) describes obstacles found in his study to be mostly universally shared obstacles such as financial, data, staffing and policy issues, whereby new feedback and learning mechanisms can help to overcome these barriers. Lozano (2012) advocates a planning process for organisational changes towards sustainability that has to address individuals, groups and the company, as well as their respective attitudes (informational, emotional and behavioural). Wiesner et al. (2011) emphasize the importance of adopting the characteristics of a learning organisation, based on a qualitative study that reflects upon the SD change journey of twelve sustainability SME champions. This is in line with Dunphy et al. (2007), who advocate the need for sufficient organisational and individual learning by stating that people are particularly likely to resist change when they see it as threatening their interests and when they believe that their knowledge and skills may be made irrelevant as changes take place. This indicates that, next to educating people on the changes, there is also a need for creating a consensus among the people involved. Sylvestre et al. (2013) however take a different perspective on this, with a focus on the university system. The authors indicate institutional and academic culture, as well as disciplinary boundaries as significant barriers for SD integration in HE. Rather than trying to craft a vision of sustainability for the whole university, they encourage a pluralistic approach by developing institutional structures that encourage differences and simultaneously facilitate interaction of disparate perspectives on sustainability. Within the field of HE, one can notice a growing number of courses and educational programs that prepare students to become sustainability change agents for the future (Hesselbarth and Schaltegger, 2014; Shriberg and Harris, 2012; Lozano et al., 2015).

2.4. Linking organisational change management with SD integration in higher education

Literature on organisational change management offers insights on the types of factors that can influence a change process. Table 2 links the discourse of Sustainable Higher Education (Table 1) with the human factors as identified within organisational change management literature. This overview shows the recurring occurrence of human factors as barriers, and it thereby supports the need for and relevance of studying barriers for the integration of SD in higher education from an organisational change management perspective, with a focus on the human factors. This is strengthened by the indications given by different scholars that the integration of sustainability can be studied and dealt with as a change process, thereby using knowledge from organisational change management.

3. Linking human factors with the integration process: a conceptual model

A conceptual model has been developed, bringing together the four clusters of human factors with the integration process (Verhulst, 2012). This model (Fig. 1) highlights the relationships between the central construct - the integration process of SD - and the human factors. The aim of the model is to serve as a basis to structure and analyse the human factors during the integration process of SD in a case in higher education:

- to gain a better understanding of the *different types of resistance* that occur, the underlying reason of the resistance, where and when it occurs in the integration process of ESD, and which factors of resistance are directly related to sustainability issues as the subject of change;
- to gather data on the way *communication* is organised in practice for different goals of communication during the integration process, and how this affects the progress of SD integration in higher education;

Table 2
Barriers for the integration of SD in HE related to human factors in organisational change management discourse.

Barriers for the integration of SD in HE	Human factors			
	Organisational culture	Resistance against change	Empowerment and involvement	Internal communication on changes
Related to lack of awareness	1. Lack of interest and involvement		✓	
	2. Lack of support		✓	
	3. Lack of professionalisation			✓
	4. Lack of policy making	✓		
	5. Lack of standard definitions SD in HE			✓
	6. Lack of recognition		✓	
	7. SD seen as a threat to academic freedom		✓	
	8. SD is not seen as relevant		✓	
Related to the structure of higher education	9. Conservative disciplinary structure of HEI	✓		
	10. Inefficient communication			✓
	11. Resistance to change		✓	
	12. Focus on short-term profit	✓		
	13. Lack of interdisciplinary research	✓		
	14. Overcrowded curriculum	✓	✓	
	15. Focus on content-based learning	✓	✓	
Related to the lack of resources	16. Lack of money		✓	
	17. High work pressure and lack of time	✓		
	18. Lack of access to information		✓	
	19. Lack of consistent legislation	✓		✓
	20. Lack of performance indicators	✓		
	21. Technical problems	✓		
	22. Lack of physical place	✓		

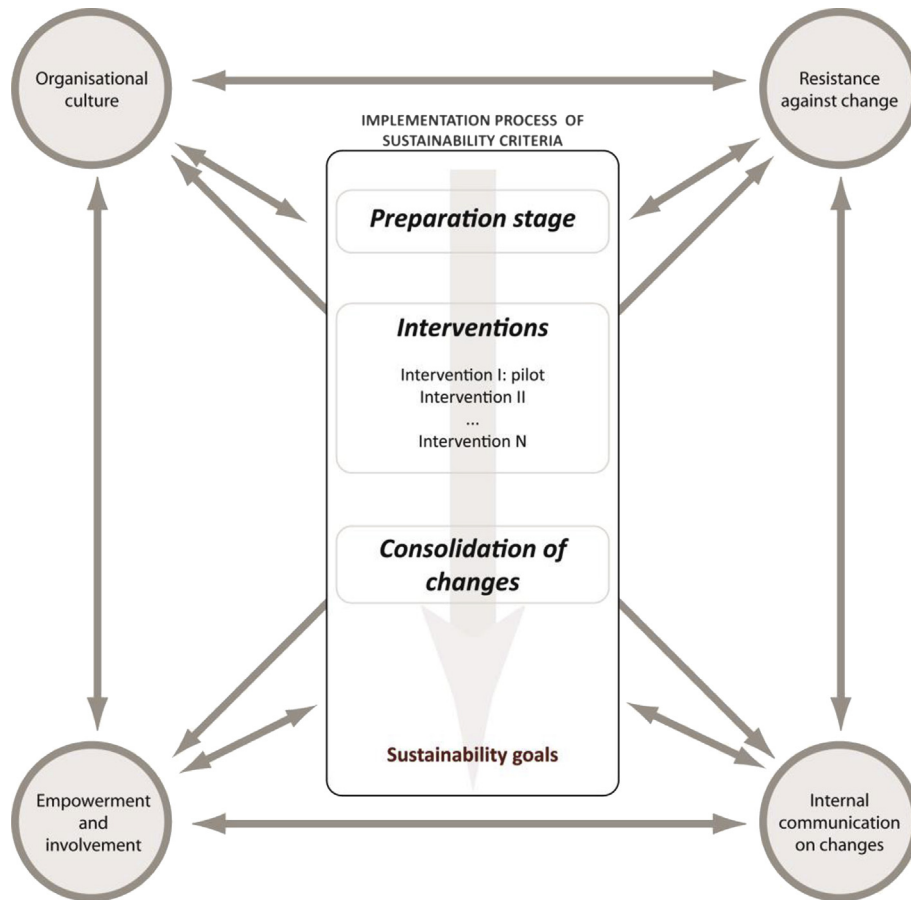


Fig. 1. Conceptual model of integration process of SD and four clusters of human factors.
Source: Verhulst, 2012

- (c) to gather empirical data that offer insights on the way *empowerment and involvement* are organised and attained in practice during the integration process of ESD;
- (d) to gather insights through empirical data, whereby the question is posed if the *organisational culture* has changed in the cases towards a new, more sustainable culture, or rather if the change process has been adapted to the present organisational culture.

The conceptual model and its structure are explained in this section. The integration process of SD in higher education forms the central construct in the model. The four clusters of human factors aim at explaining the progress of this integration process and at gathering insights on the influence of these human factors on the central construct. Each cluster is explained more in detail in the following paragraphs. Based on literature and on a previous study of Verhulst (2012), this paper focuses on four groups of human factors: resistance against change, communication on changes, empowerment, and organisational culture.

3.1. The integration process of SD

There are three main stages in a change process: a preparatory stage, a change stage with different intervention cycles, and a consolidation stage. Newman (2012) presents a similar process in an organisational change management framework for sustainability on campus with three distinct phases (awakening, pioneering and transformation) that follow an iterative process. Different

views are taken in literature on the progress of the three stages during a change process. Several authors advocate that the preparatory stage should be completed first and emphasize its importance in the change process (Beckhard and Harris, 1987; Cameron and Green, 2004; Kotter and Schlesinger, 2008). Other authors take an opposite perspective, in which a change process is approached as a dynamic process that starts with small, individual projects and that grows steadily without too much planning in advance (Boiral, 2008; Senge, 2006; Verhulst, 2012). Wiesner et al. (2011) as well as de Caluwé and Vermaak (2006) advocate both approaches. The latter authors state that a change approach is dependent on the current culture and structure of a firm, but also on the content and type of change that is to take place. Different perspectives on change approaches are thus touched in literature, whereby some authors point in the direction of bottom-up approaches of the integration process.

A clear overview of the integration process makes it possible to study connections between the human factors and how they influence the integration of SD in the different stages of the process. This construct supports the analysis of the case with the aim to gather insights on the integration process: *which steps have been taken, in which order, and the progress of the integration, what are the goals and strategy?*

3.2. Resistance against change towards SD

Resistance against change can be defined as the opposing forces that occur within an organisation that are related to change, in this

case the integration of sustainable development in higher education. Resistance is often, if not always, present when changes occur. Lewin (1951) described the impact of resistance to change and emphasised the need for deeper insights in these restraining forces. As mentioned earlier, a large number of factors of resistance have been described in the field of organisational change management (e.g. Dent and Goldberg, 1999; Johansson, 2002; Kotter and Schlesinger, 2008). Doppelt (2003) indicates that resisting factors are related to a change in situation, but not to sustainability as the subject of change. Most scholars that study success factors and obstacles of change focus on the identification and importance of these factors, but few focus on the underlying reasons, the moment or the place of occurrence of these factors (e.g. Boks and Pascual, 2004; Schein, 2004; Verhulst and Boks, 2012).

This construct supports the analysis of the case with the aim to gain a better understanding of: *the different types of resistance that occur, the underlying reasons, and where and when in the integration process they occur. Also connections between resistance and the other human factors are studied.*

3.3. Communication on changes

This is defined as all internal communication that is related to the change, i.e. the integration of SD. Different goals of communication are indicated in literature on organisational change management, including: informing stakeholders, lowering resistance, facilitating empowerment and supporting the change process (Lewis et al., 2006). Indications are given in literature that information on communication is kept rather generic, whereby specific guidance on the content of communication, channels and frequency, amongst other aspects, is lacking (Garside, 1998). Several methodologies that focus on SD provide tools and methods that can support the process, next to the provision of information and knowledge on specific sustainability issues that can be spread throughout an organisation (e.g. UNEP DTIE and DFS, 2009). But few provide specific support on communication concerning human factors (Seidel et al., 2009; Verhulst and Boks, 2012).

In this construct it is the aim to gather data on: *the way communication on SD is organised and different goals of communication during the integration process and how this affects the progress of integrating SD in the HEI.*

3.4. Empowerment and involvement

Kirkman and Rosen (1999) define four dimensions of empowerment, being 1) group potency, a belief that a group can perform well, 2) meaningfulness, a belief that a group performs important and valuable tasks, 3) autonomy, having independence and discretion in performing the work, and 4) impact, experiencing a sense of importance and significance in the work performed and goals achieved. Based on this definition and on work from other scholars (e.g. Conger and Kanungo, 1988; Karakoc, 2009; Spreitzer, 1995), empowerment is defined and studied according to three dimensions that contain different variables that provide operational measures for this construct: authority (including power, decision making and responsibility), resources and specialisation (including information, knowledge and skills) and self-determination (including initiative and creativity and autonomy). These measures are considered in (change) management literature to motivate employees and to optimise their skills in function of the organisation. Cohen-Rosenthal (2000) identifies a lack of consideration that is given to the aspects of empowerment and involvement during a change process. Literature on organisational change management also indicates that the need for empowerment is emphasised as an aspect that can significantly lower resistance

against change and support a change process (Kotter and Schlesinger, 2008).

In this construct it is the aim to gather insights on: *the way empowerment and involvement are organised and attained during the integration process according to its three dimensions, and how empowerment and involvement influence the integration process of SD.*

3.5. Organisational culture

Schein (2004) defines organisational culture as “a pattern of shared basic assumptions that the group learned as it solved its problems of external adaptation and internal integration, that has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way you perceive, think, and feel in relation to those problems”. The author defines three levels of culture. Each level thereby represents different variables that provide operational measures for capturing organisational culture as a construct. The levels are: artefacts, espoused beliefs and values, and underlying assumptions. In this article organisational culture is defined based on these levels, i.e. as the cultural characteristics that are present in an organisation and that shape its structures, processes, experiences, values and perceptions. Cameron and Quinn (2006) and Schein (2004), as well as other scholars emphasise the importance of a change in culture inside an organisation next to methods, tools and techniques that can support the process steps of a change. This includes the incorporation of sustainability criteria in its values, ways of thinking, managerial styles, and approaches to problem solving, etc. Cameron and Quinn (2006) explain that these aspects of the fundamental organisational culture need to change in order to implement a change successfully. Thus, these authors consider a change of organisational culture as an obligatory part of a complete change process. de Caluwé and Vermaak (2006) and Pettigrew and Whipp (1991), amongst other authors in the field of organisational change management on the other hand, advocate an opposite perspective. These scholars stress the need for adapting a chosen change approach to the current organisational culture, in order to raise the chance on successful integration of the changes. In the light of integrating SD in education, both perspectives are conceived as complementary. Adaptation of the change approach in the early stages of the change process can support the progress of the integration process, whereas on the long term, a shift in values, behaviours, symbols and assumptions need to be encouraged and facilitated.

In this construct it is the aim to gather insights on: *the influence of the present culture on the integration process, and on changes in the organisational culture during the integration process.*

4. Case study: applying the conceptual model in higher education

Several case studies on SD integration in HE are available (see Hoover and Harder, 2015 for an overview), but never with a specific focus on human factors. Newman (2012) for example compares two cases of integration processes of SD in HE. The results indicate that a similar - but unique - process comes forward, despite differences between institutions. The conceptual model of the integration process has up to now been applied to study human factors during the integration of SD in several commercial organisations, but never within the context of higher education. Newman's finding however suggests that the conceptual model could also be applied successfully in a HEI.

This section describes the application of the conceptual model in a single HEI: Leuven University College (KHLeuven). The SD integration process followed at this HEI serves as a case to apply

and verify the conceptual model and analyse the process with a focus on human factors. Hoover and Harder (2015) indicate a need for profound cases that tell a positive story of change as well as the challenges that occur. Such cases are important to trigger individual and collective reflexivity on SD in HE. The authors thereby support qualitative case study research for studying SD integration in HEIs, as it is particularly well suited for complex situations with multiple relationships and unclear boundaries.

The choice for KHLeuven as the case is based on several arguments. First of all, this HEI is integrating SD already for several years. Moreover, one of the authors has been strongly involved in the integration process, meaning that much information and resources about the progress and the human factors discussed in this paper were accessible for the authors. Limiting this paper to one case is based on the argument that it is the first time the integration process is studied with a focus on human factors in higher education, using an existing conceptual model for SD integration in organisations, which offers a new perspective and a structure for the data collection and analysis.

The conceptual model described in Section 3 serves as a basic structure for the case description and analysis. First, a description of the case is given, followed by an analysis of the SD integration process, the four clusters of human factors and the manner in which the human factors have influenced the integration process so far. Based on this case, the conceptual model and method for the study of the integration process in education is being verified in an educational context. This can subsequently lead to a larger number of cases to use the model in the future. Moreover, the in-depth case description provides valuable insights on the steps and progress of an integration process of SD in education in practice, added with insights on the occurrence of the four human factors and their impact on specific barriers for change in higher education.

4.1. Introduction of the case: Leuven University College – KHLeuven

Leuven University College (KHLeuven, Katholieke Hogeschool Leuven) is a university college, situated in the Flemish region of Belgium, and offering professional bachelor programs in four departments: Business studies (including business management and office management), Teacher training (kindergarten, elementary school, secondary school, special needs education), Social work (including social work and legal aid, social care, social work and human resources, social and cultural work), Health care and Technology (including nursing, midwifery, chemistry, biomedical laboratory technology and applied informatics). KHLeuven is actually a merger of five independent university colleges in 1995, resulting in the formation of a central services department that provides services for education and research coordination, human resources, quality management, informatics department, accountability, Health, Safety and Environment (HSE), procurement and communication. KHLeuven counts a total of approximately 7.000 students and 700 staff members, which means it is a middle-sized university college in Flanders. It is part of the Association KU Leuven, bringing together several Flemish university colleges and 1 university. In 2013–2014 KHLeuven is in the process of a new merger with another university college in the Association, the Limburg Catholic University College (KHLim).

4.2. Drivers, vision and strategy on sustainability

The integration of SD is always driven by internal or external influences, often complemented with a future vision and a strategy to reach that vision. The following sections describe these drivers, vision and strategy on SD in KHLeuven and provide insights in the context and on their progress in relation to the integration process.

4.2.1. Drivers and advantages for sustainability

- (1) **Individual commitment.** Different drivers and advantages for sustainability can be identified within KHLeuven, mainly internal drivers. A first important driver has been the individual commitment of several staff members within the university college. People started with certain initiatives because they felt responsible at a personal level. These people can be considered as leaders or change agents for sustainability within the organisation (Cavagnaro and Curiel, 2012). Several staff members within different departments were identified as leaders for SD, working within their course, study program or department and encouraging others to integrate SD in their work. These individual leaders were often supported by projects, financed through external funding bodies. However, when project funding came to an end, the leaders for SD felt abandoned and not supported anymore, as policy makers did not extend project funding. This proved to be an important de-motivator for leaders for SD, but also for others to start integrating SD. The intrinsic motivation of individual staff members has been a very important driver for sustainability within KHLeuven, and it also managed to bring new drivers, such as external project funding - as a result of the work of an individual staff member that successfully wrote and submitted a project proposal - and SD assessments in the different study programs at KHLeuven.
- (2) **External funding.** A second important driver that appeared throughout the years has been external funding. All projects and initiatives taken by the various departments have been funded by different organisations on various levels: the province of Flemish Brabant (local), the Flemish government (regional), and the European Commission (within the LLP-program). Without this extra financial support, a lot of initiatives would not have taken place, or would be realised at a much slower pace, or at the level of individual staff members.
- (3) **Assessment of current situation on SD.** A third driver can be identified as the assessment of the state of SD-integration at all education programs. Within KHLeuven, the Auditing Instrument for Sustainability in Higher Education (AISHE, described by Roorda, 2002) was used to measure to what extent SD was already integrated in education. This turned out to be a very effective driver, as it was an eye-opener for policy and staff (Lambrechts and Ceulemans, 2013). Within the department of Business studies, the AISHE audit of 2003 led to the definition of a vision on SD and a further integration in courses and operations of this particular department. External drivers for sustainability were not that clear within KHLeuven, although the AISHE certificate can be considered as an extra incentive for some study programs to further implement sustainability.

4.2.2. Vision and strategy on sustainable development

Within KHLeuven, different steps on several levels were taken towards defining a vision and strategy on sustainability. The department of Business studies - when doing a pilot project on corporate social responsibility, and as a result of the very first AISHE audit in 2003 - defined a vision on sustainability together with staff and students. This vision is seen as the first one within KHLeuven focussing explicitly on SD. It was defined on the level of a single department of the university college.

Staff members and SD leaders in other departments also felt the need for a vision and strategy on SD. As a result, a university college wide project 'DOHO' started in 2005 and resulted in a vision and

policy plan and strategy towards sustainable higher education, presented in 2008. The vision on SD was defined together with staff and SD leaders from each department and focused on six themes that embrace the key roles of higher education: Policy; Communication; Relations; Education; Research and Outreach; Operations. The university college wide vision is depicted in [Box 1](#).

Box 1

The KHLeuven vision on Sustainable Development and Sustainable Higher Education (9 May 2008, reported (in Dutch) in [Lambrechts et al., 2009](#))

Today's society is at a turning point. The Western societal model is facing a number of limits on a global level – such as limited energy supply, limited food services and limits of the carrying capacity of the environment – and will as a result of this, undergo a number of changes. Mankind will thus have to take a closer and critical look at her own actions and herein higher education definitely has a role to play: after all it is here that the future adults are educated, and higher education has to prepare them for the changes of the future. We want to contribute to the formation of a sustainable society, with a balance between economic, social and environmental aspects. In order to do this, KHLeuven does efforts to make its policy, communications, education, operations, research and outreach sustainable in a continuous process of improvement, and in consultation with all stakeholders.

1. At the **Policy** level KHLeuven's ambition is an optimal integration of sustainable development in consultation with all policy areas. As an organisation-wide focal point, sustainable development is a compass for all policy areas;
2. KHLeuven is in favour of efficient **Communication** concerning its efforts in terms of sustainable development. Next to this, efforts are also made to make the communication process more sustainable;
3. KHLeuven's aim is to establish sustainable **Relations** with its internal and external stakeholders: students, staff, professional field, local and regional surroundings (city of Leuven, Flanders), the natural environment. KHLeuven would like to respond to the needs and expectations of the professional field and of society, but also be an inspiration to encourage the professional field and society to move towards sustainable development;
4. A more sustainable **Education** is aimed at preparing students for the great challenges that we face as a global society. Staff is encouraged to teach their students with an open mind, exchange of learning experiences and respect for other cultures and opinions;
5. A more sustainable approach to **Research and Outreach** is aimed at a conceptual and methodological reorientation of this field. To this end, more multi-disciplinary and trans-disciplinary research as well as the integration of research and education are encouraged;
6. In terms of its own **Operations** KHLeuven takes concrete actions to stay within the boundaries of the earth's capacity, with attention to man, the environment and society. To this end, it works to develop an internal environmental care system and commits to implementing a sustainable personnel policy, where wellbeing is at the center, and with room for participatory and transparent communication.

In order to guide the integration process within KHLeuven, a policy plan for SD was defined, envisioning the period between 2008 and 2013. This policy plan was developed following a bottom-up approach, with input from staff members from each department and study program of KHLeuven. It resulted in a plan with six strategic goals (referring to the six key themes in the SD vision), divided into thirty operational goals and seventy actions and indicators. [Box 2](#) gives an example of the strategic goal 4 "KHLeuven integrates SD in her education" and its operational goals.

In addition, as a result of the attention given to SD in several projects, sustainability goals and initiatives were integrated in other policy plans, e.g. the educational policy plan, the research policy plan and the Health, Safety and Environment policy plan.

An implementation model was defined to guide the operationalisation of the policy plan. This implementation model included different stepping-stones, guiding principles and key success factors for SD integration at the level of a single HEI, within its current structure and framework. For the key roles of a HEI, namely (a) education, (b) research and outreach, and (c) operations, specific guidelines were presented. The implementation model is described and presented in [Lambrechts et al. \(2009\)](#). [Fig. 2](#) shows the general aspects of the implementation model.

4.3. The integration process

In order to be able to study the influence of the different human factors, it is necessary to get a good overview of the different stages and activities that have been taken during the integration process of SD, the types of activities and the progress of the integration. This is related to the central construct of the conceptual model: the integration process.

The SD integration process at KHLeuven started with individual projects and activities that supported a further integration. Over the past ten years, a lot of initiatives were taken within different departments. [Table 3](#) shows the most important initiatives in the integration process.

4.3.1. Description of the steps taken in the integration process

Regarding the integration process, different types of initiatives were taken at KHLeuven:

Individual projects, focussing on a particular topic or study program, and funded by external organisations. Quite often, these projects also had the intention to create and integrate instruments, models or frameworks within the organisation, e.g. the competence

Box 2

KHLeuven SD policy plan 2008–2013, strategic goal 4

Strategic goal 4. KHLeuven integrates SD in her education

- Operational goal 4.1. Integrate SD in competences of our study programs
- Operational goal 4.2. Methodological integration of SD principles
- Operational goal 4.3. Participative learning and assessment process
- Operational goal 4.4. Integrate relevant SD content in study programs
- Operational goal 4.5. Integrate SD principles in practical organisation of education
- Operational goal 4.6. SD integration in visitation and accreditation process

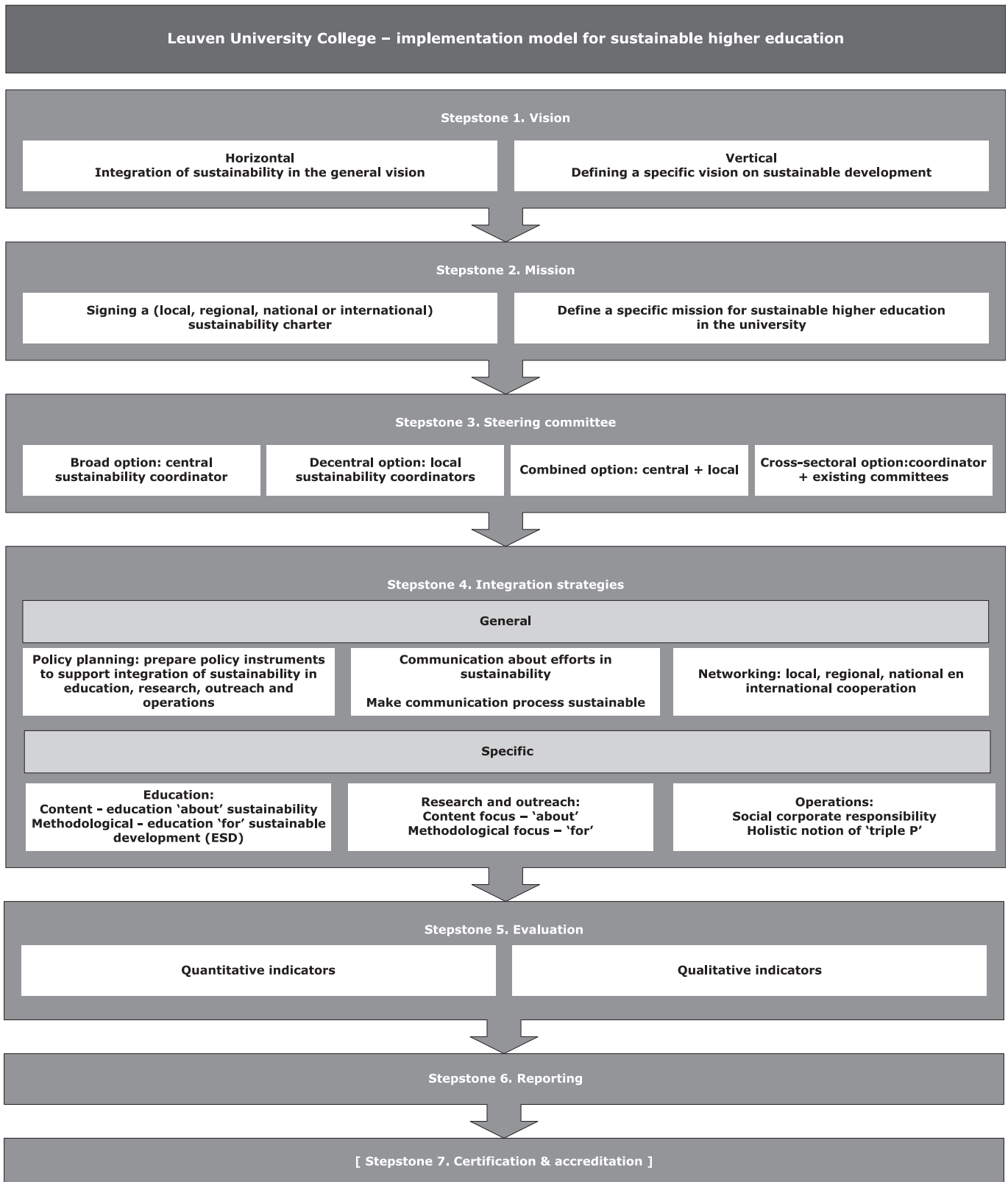


Fig. 2. General SD implementation model.

Source: Lambrechts et al., 2009

model for teacher training, the e-modules on responsible business, the framework for SD in social work. However, often these instruments and models were not successfully and structurally embedded within the organisation.

Projects at a general level started when funding was available and stimulated collaboration between different departments. The first general project started in 2005 and focused on the implementation of SD in higher education.

Table 3
Overview of SD initiatives within KHLeuven.

Year (start)	Year (end)	Initiative	Level	#	Type
2003	2004	Project: Environmental care & sustainable campus	Department of teacher training	1	◇
2003	2004	Project: integration of CSR in education	Department of business studies	2	◇
2003		First AISHE audit	Department of business studies	3	★
2004		Second AISHE audit	Department of business studies	4	★
2004		Defining vision on SD	Department of business studies	5	○
2004	2008	Project: Competences, Sustainability, Curriculum, Teacher training (CSCT)	Department of teacher training	6	◇
2005	2008	Project: integration of SD in higher education (DOHO)	General level	7	●
2005		AISHE audits	Department of teacher training	8	★
2005		AISHE audits	Department of social work	9	★
2005		AISHE audits	Department of health care and technology	10	★
2006		AISHE audits	Department of teacher training	11	★
2006	2008	Project: sustainable Tuesdays	Department of health care and technology	12	◇
2006	2008	Project: Ecological Footprint in schools	Department of health care and technology	13	◇
2007		AISHE certificate – one star awarded to all study programs	General level	14	★
2007	2009	Project: Science on Wheels – Science for Sustainability	Department of health care and Technology	15	◇
2007	2009	Project: Social Work and SD (SOWEDO)	Department of Social Work	16	◇
2007	2010	Project: SD integration in marketing study programs	Department of business studies	17	◇
2008		SD vision formulated for the whole university college	General	18	●○
2008	2013	first SD policy plan, envisioning the period of 2008–2013	General	19	●○
2008	2010	Project: E-learning modules for Responsible Business (REBEL)	Department of business studies	20	◇
2009		results of the DOHO project published and presented to larger public (external communication)	General	21	●
2009		AISHE audit	Department of business studies	22	★
2010		AISHE audit	Department of business studies	23	★
2010		AISHE certificate – two stars	Department of business studies	24	★
2011	2012	Project: calculation of the Ecological footprint of KHLeuven	General	25	●
2012		sustainability criteria integrated in general quality management system	General	26	●★
2013	2014	Project: sustainable food within the university colleges' restaurants	General	27	●
2013	2014	Project: ESD-competences for marketing teachers	Department of business studies	28	◇

Policy and strategy on SD initiatives, focussing on defining a vision on SD, goals, actions and policy planning. These initiatives were a bit more successful in embedding SD within the organisation, however, a true fit between bottom-up and top-down was not achieved on the long term, as a translation from the general level to the local (departmental) level was not always successful.

Evaluation and assessment of the current situation of SD integration. Within all study programs of KHLeuven, several AISHE audits were done in order to find out where and to what extent SD is already integrated. The results were used to start new initiatives and to improve the SD integration. These audits were often a starting point for the integration of SD for the individual study programs.

Fig. 3 shows a timeline of the SD initiatives as shown in Table 3.

4.3.2. Integration approach

Looking at the timeline and different initiatives within KHLeuven, several stages within the integration approach can be detected:

(1) First stage (2003–2005): bottom-up, local leaders for SD.

This stage actually started before 2003, as many SD initiatives had already been taken by individuals before this date. This stage is characterised by several initiatives going on within different study programs, and individuals working within their own courses and projects.

(2) Second stage (2005–2007): local leaders for SD are supported with external, project-based funding.

Leaders for SD got the opportunity to further work on the topic, connect their work to each other, exchange experiences and expertise, prepare policy documents and new initiatives.

(3) Third stage (2007–2010): SD topic made prominent at the level of the university college.

The bottom-up approach meets a top-down approach. Ideally, the university college-wide vision, as described in Box 1, was meant to be translated at the level of a single department or - given the diversity and singularity of courses and programs - even at the level of a single study program. Initiatives were taken in different departments and study programs, however not all managed to embed the vision and strategy at the local level.

(4) Fourth stage (2010–2013): individual projects stop, results are reported.

Some new projects start up, but there's a risk the situation is going back to the second stage, where the integration process depends largely on the interest and goodwill of local leaders for SD and external funding.

It is clear that, however at some point the bottom-up approach was picked up by a central vision and policy plan, this is not enough to really support the initiatives. This comprises a very important issue within the integration process of SD, namely the risk of getting back to business as usual after project funding and support stops.

4.4. Human factors during the integration process

In the previous section, a clear overview is given on the integration process at KHLeuven, its stages and the activities that happened throughout the process. In the following sections, insights are presented on the four constructs on human factors: resistance, communication, empowerment and involvement, and organisational culture. The different aspects of each of the constructs are described for the case of KHLeuven.

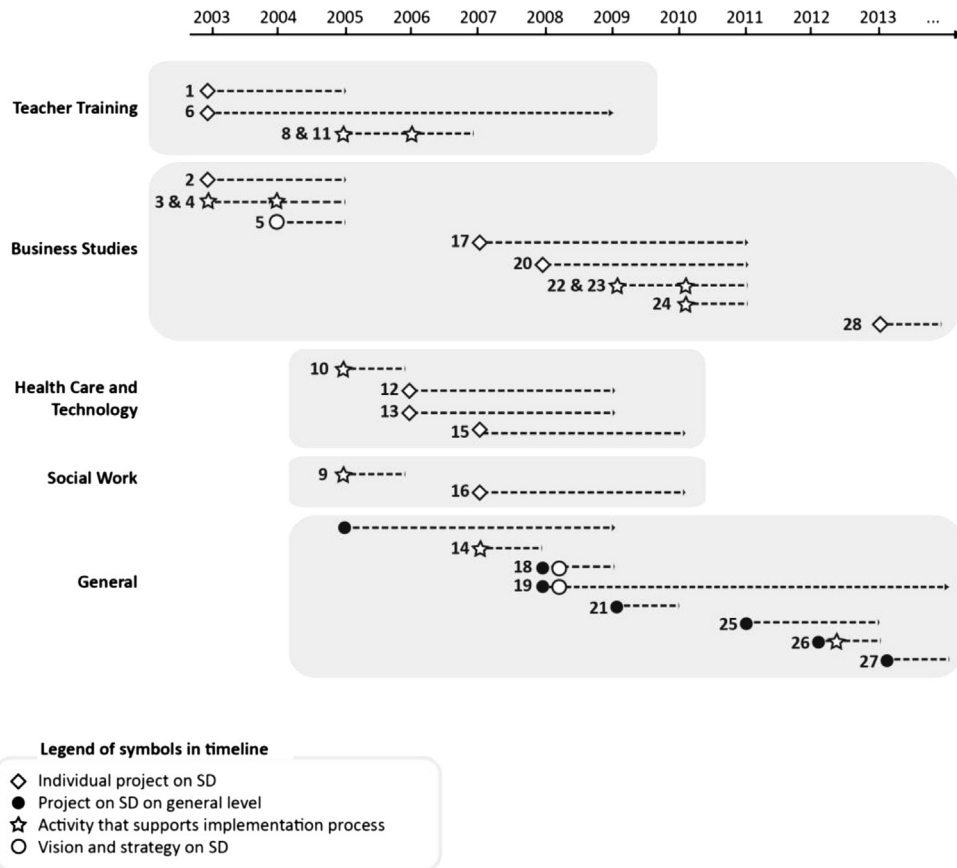


Fig. 3. Timeline SD initiatives at KHLeuven.

4.4.1. Significant factors of resistance

With the analysis of the construct on resistance it is the aim to gather insights on the different types of resistance that occur, the underlying reasons, and where and when in the integration process they occur. Within KHLeuven, following factors of resistance are defined:

Lack of support. Local leaders for SD did not always feel supported by colleagues or policy makers, as they did not see the relevance of the topic for the university college.

Lack of resources. A very important factor of resistance was the lack of resources for SD-projects: in a climate of cutting costs, very strongly felt within the Flemish professional bachelor programs, and made worse by the 2008 financial crisis, it was very hard to find proper support for SD related projects and initiatives. Most of the projects were supported by external project-based funding, which is a good start, but does not give any guarantee of a structural integration of SD into the university system.

Sustainability-fatigue. After a few years of focussing on the theme, some people felt in a way which can be described as a “Sustainability-fatigue”: people did not like the concept of SD or the story of uncertainty and precaution that is inherently linked to SD.

Demotivation. Local leaders for SD got demotivated after their projects finished, because there was no (financial) support for continuing or related projects, meaning that not much happened with the work they completed. There was growing insecurity about the continuity of SD integration and disappointment after projects

were reported, as project results were not fully implemented in the general structure of the organisation.

4.4.2. Communication on sustainability issues

In this section, the communication methods and types that have been used at KHLeuven within the different stages of the integration process are presented.

In the period of 2003–2006, the AISHE-audits of all study programs pointed out that communication about SD issues was a weak point within KHLeuven. Students and employees were not aware about the initiatives and efforts, and therefore, there was a lack of acknowledgement of the topic. As a result, a lot of effort was made to communicate the SD initiatives and tackle this lack of visibility, also supported by the vision, strategy and policy plan for SD. Communication on SD happened in the form of:

- Seminars and round tables on SD related topics for students;
- Staff development initiatives;
- Internal communication through the internal communication platform;
- External communication through press releases about SD initiatives.

The communication was focused on two types of content: (a) Presenting the results of specific projects of KHLeuven, e.g. market research on segmentation of consumers based on their thoughts and attitudes towards SD, the results of the AISHE audits, the integration of SD in social work, etc.; (b) Communication about specific topics and methods to enable students and staff to integrate SD in their own work, e.g. thematic lectures on SD issues,

information sessions about competences for SD, guidance of staff to integrate SD in their own course, etc.

The extra effort on communication on SD issues were awarded in the 2010 AISHE audit, as the criterion regarding “communication” was evaluated to be very strong. However, continuing attention is needed for communication on SD issues. The training initiatives for employees were not always that successful, and sometimes decisions at policy level - e.g. when funding for SD projects and coordination stopped - resulted in actions that were rather negative for the SD integration process.

4.4.3. Empowerment and participation

In this section a description is given of the way empowerment and involvement are organised and attained during the integration process of SD at KHLeuven, according to three dimensions: authority (power, decision making and responsibility), resources and specialisation (information, knowledge and skills) and self-determination (initiative, creativity and autonomy).

4.4.3.1. Authority: power, decision making and responsibility

Responsible for own course/project. In the first stage, local leaders for SD operated within their own courses, projects or small initiatives in which they had the power in the decision process and full responsibility on the project and its results.

Bottom-up approach The draughting of a university college wide SD policy plan at KHLeuven can be regarded as an example of a bottom-up approach in policy planning, thus empowerment of local leaders. The policy plan was draughted by a group of nine employees from all departments and study programs, in a process of presentations and discussions about the topic. The structure of the policy plan follows the general policy framework of the KHLeuven, thus providing an optimal fit with other policy plans. A lot of individual leaders for SD hoped that the policy plan would encourage a university college wide integration of SD, as it provided a link between bottom-up and top-down approach. However, the role of individual employees cannot be underestimated in this process, as the top-down guidance needed to be translated at the level of the individual departments and study programs again.

Working group of ambassadors A key role in the SD integration process of the policy plan at KHLeuven was the Sustainable Higher Education working group, which brought together ten employees – ambassadors of SD -, coming from all departments, and representing study programs, research and policy of the organisation. The working group had three goals:

- (1) Steering committee of the university college wide DOHO project (2005–2008).
- (2) Prepare the SD vision and strategy, documented in the SD policy plan.
- (3) Initiate new SD initiatives in the different study programs and departments.

Being member of this working group was an official task, as each member received a certain percentage of Full Time Equivalent (FTE) to spend for this purpose. The percentage FTE ranged from 2,5 to 5 per member. It gave them the responsibility by allowing them to spend time to the working group and SD integration. The presence of these ambassadors made it possible to bring together the bottom-up approach with the top-down approach, whereby the ambassadors ensured a two-directional flow of grasping and spreading information, initiatives, ideas, as well as to enthuse other employees about SD within their department. Again, after the project-based funding stopped, no guarantee on a structural integration or support could be given, which made the local leaders – the ambassadors – feel left alone and demotivated.

4.4.3.2. Resources and specialisation: information, knowledge and skills

Different stages can be seen regarding information, knowledge and skills:

- (1) **In the first stage**, where local SD leaders were operating individually, information was not spread and shared, because the leaders did not know each other's initiatives. This resulted in comparable, but isolated, initiatives in different departments.
- (2) **In the second stage**, in order to tackle this problem, a big inventory of SD initiatives was started in all departments and study programs. This inventory collected all SD initiatives taken within the KHLeuven. Results of the inventory showed that since the start of the university college wide DOHO project in 2005, the amount of initiatives clearly increased, as shown in Fig. 4. The focus of the initiatives varied between curricular initiatives, research, outreach and operations, or a combination. Nearly half of the initiatives were targeting students. Fig. 5 and Fig. 6 show the focus and target groups of the initiatives in the inventory.
- (3) **In the third stage**, local leaders and their initiatives learned from one another, resulting in strong cooperation between several employees and groups. At that stage, the information was available, known, shared and used by all departments and study programs. Project-based funding allowed local leaders for SD to connect, exchange thoughts, ideas and expertise, and prepare policy documents.
- (4) **A fourth stage** is characterised by a new translation process from the central viewpoint to the individual and departmental level. As local leaders stopped working on the topic (due to retirement or end of funding), information was again gathered and used at the local level, and not always shared between all internal stakeholders. The fourth stage is therefore heading back towards the first one.

Self-determination: initiative, creativity and autonomy

Importance of individual initiatives The initiative for SD integration always came from individual employees, who were interested in the topic and wanted to achieve something within their own working area. These individuals can be seen as local leaders for SD or ambassadors.

Autonomy, freedom and creativity As these individual employees gained expertise in the field of SD, they were also successful in writing project proposals that were funded by external organisations. This external funding was an extra incentive for SD integration, as people could spend a certain amount of their time to focus

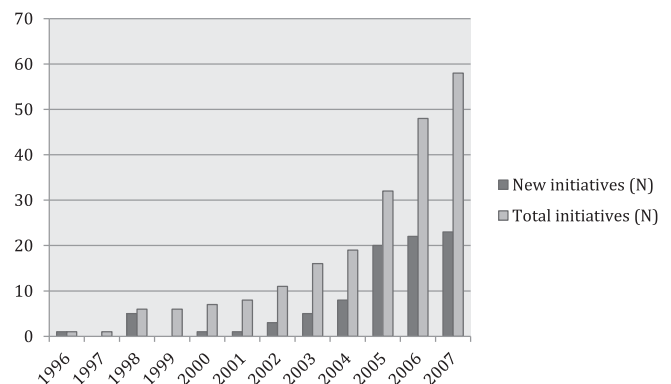


Fig. 4. Number of SD initiatives (new and total) identified in the inventory. Lambrechts et al., 2009

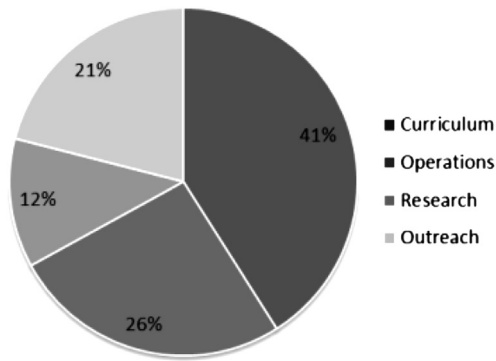


Fig. 5. Focus of initiatives. Lambrechts et al., 2009

on SD in the KHLeuven. A high level of autonomy is given to these employees to write and fulfill projects. This also accounts for other employees and how they want to integrate SD in their individual courses. It offers individuals the freedom for creativity in their work.

4.4.4. Organisational culture: adaptations

This section offers insights on the last construct, organisational culture. It describes how the present culture formed the integration process, as well as what the influence was of the integration of SD on the organisational culture.

The organisational culture within KHLeuven is characterised by the following aspects:

Core values and competences A first cultural characteristic is defined in the overall core values and core competences for all staff and students. KHLeuven pays particular attention towards (a) learning, (b) commitment, (c) initiative, (d) cooperation and (e) respect. As a learning organisation, taking initiative, being committed and cooperate in a respectful way are key elements of the culture.

Decentralised structure, many different cultures A second cultural characteristic results from the specific outcome of the merger in 1995. However merged into one organisation with a central department for overarching services, the - at that time - five departments were still operating autonomous in a decentralised structure and with their own specific identity and culture.

High level of autonomy of staff A third characteristic is found in the individual role and autonomy of staff in all departments and study programs. Like many HEI's, staff has a lot of freedom in the way they organise their courses, projects and way of working. This

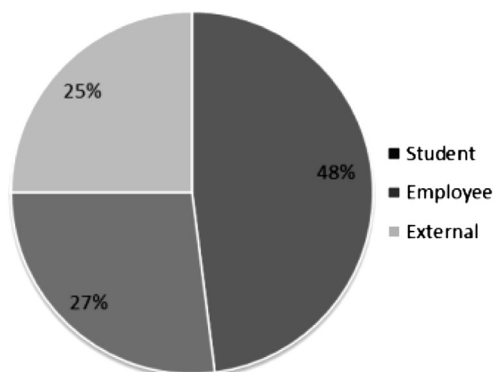


Fig. 6. Target group of the initiatives. Lambrechts et al., 2009

is shown in the first stage of the integration process, where individual staff members were starting with SD initiatives. This characteristic cannot be underestimated, because without this individual freedom, staff would not have the chance and freedom to develop innovative ideas and initiatives.

(No) implementation on departmental level A fourth characteristic emerged during and after the DOHO-project. Working together on this specific project offered the organisation the opportunity to prepare SD integration and draft plans, instruments and models. A lot of initiatives were taken, a lot of products and outcomes were available, but they were poorly integrated in the structure of the organisation. This is shown by the SD implementation model, which was draughted bottom-up, then provided top-down guidance on SD integration through the policy plan, but unfortunately was poorly translated into the autonomous level of departments and study programs.

5. Discussion

In the previous sections a description is given on the separate constructs of the conceptual model (Fig. 1) and how they occurred in the case study. Section 5.1 discusses how the human factors influenced the different stages of the integration process, as well as how these human factors are mutually related. Table 4 gives an overview of the presence of the different human factors in each of the stages.

Section 5.2 discusses the lessons learned from the case study and the application of the conceptual model in a HEI.

5.1. Influence of human factors on SD integration in higher education

When considering the progress of the integration process of SD in KHLeuven, one can notice that the main stages strongly correspond with the first iterative stages of a change process mentioned by different authors (e.g. Newman, 2012; Boiral, 2008; Verhulst, 2012): starting with independent projects, then working towards a shared vision, mission and strategy for SD, and then aiming at integration of this vision, mission and strategy in the whole organisation. However, the latter stage only partially took place at KHLeuven because of a lack of resources resulting from the end of the DOHO project and the high level of independence of individual study programs and departments.

The first stage of the integration process corresponds with results from earlier studies, in which several independent projects are performed by individuals that have a strong intrinsic motivation to work on SD, even without financial or other support (Hoover and Harder, 2015; Newman, 2012; Verhulst, 2012). These individuals are the initiators of the integration of SD in the HEI and can be found anywhere within the vertical and horizontal hierarchy of the HEI (Newman, 2012). A high level of autonomy, together with this intrinsic motivation, led to several projects that support SD at KHLeuven.

In the second stage, several – still independent – projects have been completed, whereby communication between the project teams was provided. This provided opportunities to exchange knowledge and information, to learn from and support each other. This strengthened the connection between the teams and supported their will to work further – together – on the integration on SD on a larger scale. This is, however, only possible when also other employees than those in the project teams, do get involved in SD integration: through communication. Within KHLeuven, this need was indicated by the AISHE-audits. This result is in line with the specific role attributed to communication within the

Table 4
Overview of approach and human factors in the subsequent stages of the integration process of SD in the KHLeuven case.

	Approach	Factors of resistance	Communication	Empowerment	Culture
First stage	Bottom-up, individual interest in course or project	(Strong intrinsic motivation of individuals)	No coordinated communication on SD	Individual initiatives, isolated and not aware of each other	* Core values and core competences focussing on learning, commitment, initiative, cooperation and respect,
Second stage	Bottom-up, several projects on individual level; connecting between projects	Lack of support for SD leaders	Communication between SD projects	Project funding for SD-projects, giving a boost to the SD integration. More collaboration between local leaders.	* Autonomous culture in departments and study programs
Third stage	Bottom-up meets top-down; development of SD implementation plan and strategy	–	Coordinated communication on SD by committee to employees and students	Bottom-up approach to develop models, plans and structures for SD integration. Committee with local leaders (ambassadors). The bottom-up approach leads to top-down guidance for SD integration with the design of an implementation model, a policy plan and key success factors. Individual leaders feel acknowledged for their work.	* Autonomous role of individuals in the organisation
Fourth stage	Top-down approach not structurally embedded within the organisation.	'Sustainability fatigue', lack of support for SD leaders, lack of funding for SD-projects, demotivation after projects ended	Less coordinated communication on SD	After project funding stops, no new funding provided. This results in demotivation of individual staff and a lack of translation of the top-down models at the level of individual departments and study programs.	

implementation process (de La Harpe and Thomas, 2009), more specifically to raise awareness and acceptance (Barth, 2013).

In a third stage, a lot of attention has been paid to communication, focussing on (a) communication about SD-initiatives and results of KHLeuven, and (b) communication about SD related topics to staff and students in order to enhance their abilities to integrate SD. Internal communication thereby focused on spreading information (e.g. intranet, seminars) and empowerment and participation (e.g. committee on SD, local leaders, round tables, trainings). The different types of internal communication on change correspond with earlier findings from Lewis et al. (2006) and Verhulst (2012). The communication raised the participation and empowerment of a larger group of employees, which was even strengthened by the bottom-up approach that has been followed to design an implementation model, a policy plan and key success factors for SD integration in the whole HEI. The bottom-up approach provided a framework for top-down guidance of SD integration. This finding is in line with the positive impact of collaboration in the processes of change, as this creates a 'shared vision' and creates ownership (of Hoover and Harder, 2015).

In this stage, individual leaders felt acknowledged for their work. This approach also enabled a small shift in culture, whereby the strong presence of autonomy of both individuals and departments was set aside for a shared goal: the integration of SD at KHLeuven. Empowerment and communication form two factors that strongly supported the integration of SD in this stage. This corresponds with the transitioning phase between pioneering and transformation as presented by Newman (2012), in which the focus shifts from a singular focus towards a common vision and a broader division of responsibility and accountability of a larger group of stakeholders across the institution.

In a fourth stage, the top-down approach is not embedded structurally within the organisation. After project funding stopped, no new funding was provided, resulting in demotivation of individual staff and a lack of translation of the top-down models at the level of individual departments and study programs. Newman (2012) describes this as a flatline that can occur when the integration of SD expands across all areas of the organisation but does not manage to reach a wide-scale alignment of goals, implementation plans and financial support.

Shifting from a bottom-up to a top-down approach entails a larger group of employees that will need to get informed and involved in the process. In order to successfully make this shift, one needs support from the top level of the organisation, more attention for empowerment and communication, both confirmed within an organisational change management context (Verhulst et al., 2012), as in a higher education for SD context (Barth, 2013; Newman, 2012). In this case however, the opposite occurred: due to the end of the large DOHO project, communication on SD ended, which on its turn led to a drop in attention for empowerment and participation. Together with this, coordination responsibilities on SD issues – previously to the local leaders - were suddenly lacking. This resulted in more resistance, amongst others initiators feeling abandoned, lack of support for SD leaders, sustainability-fatigue, demotivation after projects ended. This finding corresponds with the insight of Kotter and Schlesinger (2008), who indicated the need for empowerment to lower resistance. Concerning cultural aspects, one can notice that the small change towards a common goal shifts back into the autonomous culture in departments and study programs and the autonomous role of individuals in the organisation. This shows that, how many initiatives undertaken bottom-up and top-down, there is always a risk that after specific projects end, the university system is going "back to business as usual", or give this impression to different stakeholders, including early SD-champions in different departments.

5.2. Lessons learned

A first lesson learned is on the analysis of the integration of SD in a HEI. It shows differences in human factors that can support or hamper the integration process in its subsequent stages. Depending on the stage, attention should thus be focussing on specific aspects, e.g. empowerment is mostly focused on a small group of ambassadors in the first stages of integration, whereas the efforts towards empowerment needs to get expanded seriously in later stages, when a larger group of employees at the HEI needs to get involved. This finding is in line with the specific role attributed to staff within the implementation process, and the need for staff development (Barth and Rieckmann, 2012).

A second lesson learned is that the many barriers for SD integration in higher education, as shown in Table 1, (1) are not all present within the case, (2) the ones that could be identified, were only apparent during specific stages, (3) could not be seen as separate barriers, but as interfering and influencing each other. Furthermore, the application of the conceptual model and the different constructs enables the HEI representatives to go beyond the mere listing of barriers. The analysis provides deep insights in the underlying causes of barriers and the effects of certain measures, e.g. funding in one stage and the end of funding in a next stage. This finding is in line with results from the literature (e.g. Barth, 2013) and confirms the appeal to emphasize processes of change in higher education (Hoover and Harder, 2015).

Furthermore, a third lesson learned within this case of applying an organisational change management model in a HEI is that it creates a deep awareness on how different barriers are linked to each other, and are influencing each other. The integration process cannot be seen as a continuously proceeding process, the reality shows many ups and downs, and the risk of a rebound effect, sustainability-fatigue and de-motivation of individuals. The personal commitment that several individuals have taken in the first stage, has led to external funding of projects, and thus enabled the bottom-up approach to meet the top-down approach, but also led to the risk of de-motivation after the external funding stopped. This finding provides support to acknowledge the incremental achievements of individual change agents within HEIs (Spira et al., 2013).

This leads to the fourth lesson learned, which appears to be an important issue in this case, i.e. the need for continuity on integrating SD in higher education on the level of strategy, financial resources and capability building. The integration process found in the case, with its ups and downs, thereby provides support for the erratic and iterative nature of the integration process of SD in HE (Newman, 2012). External funding is often seen as an important driver in the implementation process (Barth, 2013). In order to surpass the dependence on the sequence and continuity of projects with external funding, and thus preventing a rebound effect on all the efforts on SD integration, a HEI could assign responsibility (and time) on SD integration to one or more employees with internal funding. However, there are not that many educational institutes where the financial situation makes this possible. Another option is to foresee a long-term continuation of the integration process. This can be done together with the development of a strategy, in which the different goals and steps of the integration of that strategy are being planned. There, one can include a long-term plan that indicates a timeline of several subsequent projects, as well as the resources needed for each project. By including this in the strategy on SD, the HEI can proactively apply for external funding and projects that support SD integration in higher education.

6. Conclusions

This paper discusses the integration of SD in higher education from the perspective of organisational change management, with a focus on human factors: resistance, communication, empowerment and organisational culture. A conceptual model bringing together these four human factors with the integration process has been used to analyse the case of KHLeuven.

The case study provides insights on the progress of the integration process. In the ten-year period of 2003–2013, the SD integration at KHLeuven followed four stages. The case shows two types of resistance that emerged: resistance related to financial and structural support and resistance related to empowerment and personal support. The case also showed that the bottom-up approach successfully connected with a top-down approach, but that there still is

a risk for de-motivation and sustainability fatigue after initiatives (and funding) ends. Moreover, indications are given in the case that good communication and empowerment - and their mutual connections - form a critical element to successfully integrate SD in higher education. For the HEI, the analysis offers more profound insights on how human factors can influence the integration process. The case provides valuable insights for supporting future integration processes within the studied and other HEIs.

The case study also served as a test case for validating the conceptual model on human factors in SD integration in an HE context. It has been used to guide the researchers in analysing the case study. This was done by offering a structure as well as sufficient background on each of the human factors to collect and analyse profound insights on each of them. Previous cases that used the conceptual model thereby served as guidance, next to the model itself. The conceptual model proved to be an enriching framework to study the SD integration in higher education in depth, with a focus on human factors and their influence on the process. It offers good guidance to structure the integration process of SD in the HEI. Moreover, it makes the scholar reflect on the four types of human factors in depth, and in relation to the different stages of the integration process. Supporting this reflexive process forms a strength of the conceptual model.

Further improvements on the conceptual model should focus on a more explicit guidance of the data gathering, e.g. a more elaborate questionnaire. Also a better framing of the different types of human factors could improve the model to make it more accessible. For example, the definition of the human factor 'organisational culture' is very broad and needs reviewing to make it more comprehensible and measurable for the scholar(s) that want to use the conceptual model. Overall, the conceptual model provides a supporting framework to scholars and practitioners in studying the integration process of sustainable development and in gathering profound insights on what and why changes take place. This in turn can trigger individual and collective reflexivity on SD in HE. The authors plan to further improve and apply the model in other cases.

References

- Adams, J.D., 2003. Successful Change. Paying attention to the intangibles. *OD Pract.* 35 (4), 3–7.
- Barth, M., 2013. Many roads lead to sustainability: a process-oriented analysis of change in higher education. *Int. J. Sustain. High. Educ.* 14 (2), 160–175.
- Barth, M., Rieckmann, M., 2012. Academic staff development as a catalyst for curriculum change towards education for sustainable development: an output perspective. *J. Clean. Prod.* 26, 28–36.
- Beckhard, R., Harris, R., 1987. *Organizational Transitions*, second ed. Addison Wesley, Reading, MA.
- Belliveau, P., Griffin, A., Somermeyer, S.M., 2004. *The PDMA Toolbook for New Product Development*. John Wiley & Sons Inc, New Jersey, USA.
- Boiral, O., 2008. Greening the corporation through organizational citizenship behaviors. *J. Bus. Ethics.* <http://dx.doi.org/10.1007/s10551-008-9881-2>. Springer.
- Boks, C., 2006. The soft side of ecodesign. *J. Clean. Prod.* 14, 1346–1356.
- Boks, C., Pascual, O., 2004. The role of Success factors and obstacles in design for environment: a survey among Asian Electronics Companies. In: *IEEE International Symposium on Electronics and the Environment*, May 2004. Scottsdale, USA.
- Cameron, E., Green, M., 2004. *Making Sense of Change Management. A Complete Guide to the Models, Tools & Techniques of Organizational Change*. Kogan Page, London, UK.
- Cameron, K.S., Quinn, R.E., 2006. *Diagnosing and Changing Organisational Culture. Based on the Competing Values Framework*, revised ed. Addison Wesley Longman Inc, USA.
- Cavagnaro, E., Curiel, G., 2012. *The Three Levels of Sustainability*. Greenleaf Publishing Limited, Sheffield, UK.
- Cohen-Rosenthal, E., 2000. A walk on the human side of industrial ecology. *Am. Behav. Sci.* 44 (2), 245–264.
- Conger, J.A., Kanungo, R.N., 1988. The empowerment Process: integrating theory and practice. *Acad. Manag. Rev.* 13 (3), 471–482.
- Cunha, M.P., Clegg, S.R., Rego, A., Story, J., 2013. From the physics of change to Realpolitik: improvisational relations of power and resistance. *J. Change Manag.* 13 (4), 460–476.

- de Caluwé, L., Vermaak, H., 2006. *Leren veranderen. Een handboek voor de veranderkundige*. Kluwer, Deventer, The Netherlands.
- de La Harpe, B., Thomas, I., 2009. Curriculum change in universities : conditions that facilitate education for sustainable development. *J. Educ. Sustain. Dev.* 3 (1), 75–85.
- Dent, E.B., Goldberg, S.G., 1999. Challenging "resistance to change". *J. Appl. Behav. Sci.* 35 (1), 25–41. March 1999.
- Doppelt, B., 2003. Overcoming the seven sustainability blunders. *Syst. Think.* 14 (5), 2–7.
- Dunphy, D., Griffiths, A., Benn, S., 2007. *Organizational Change for Corporate Sustainability. A Guide for Leaders and Change Agents of the Future*, second ed. Routledge, New York.
- Garside, P., 1998. Organisational context for quality: lessons from the fields of organisational development and change management. *Qual. Health Care* 7 (Suppl. 1), S8–S15.
- Hesselbarth, C., Schaltegger, S., 2014. Education change agents for sustainability – learnings from the first sustainability management master of business administration. *J. Clean. Prod.* 62, 24–36.
- Hiatt, J., Creasey, T.J., 2003. *Change Management: the People Side of Change*. Prosci Research, Colorado, USA.
- Hoover, E., Harder, M.K., 2015. What lies beneath the surface? the hidden complexities of organizational change for sustainability in higher education. *J. Clean. Prod.* 106, 175–188. <http://dx.doi.org/10.1016/j.jclepro.2014.01.081>.
- IBM, 2008. *Making Change Work*. Available online at: <http://www-935.ibm.com/services/us/gbs/bus/pdf/gbe03100-usen-03-making-change-work.pdf> (accessed 10.05.11).
- Johansson, G., 2002. Success factors for integration of ecodesign in product development - a review of state-of-the-art. *Environ. Manag. Health* 13 (1), 98–107.
- Karakoc, N., 2009. Employee empowerment and differentiation in companies: a literature review and research agenda. *Enterp. Risk Manag.* 1 (2), E1.
- Kegan, R., Lahey, L.L., 2001. The real reason people won't change. *Harv. Bus. Rev.* November 2001.
- Kirkman, B.I., Rosen, B., 1999. Beyond self-management: antecedents and consequences of team empowerment. *Acad. Manag. J.* 42 (1), 58–74.
- Kotter, J.P., 1995. Leading change: why transformation efforts fail. *Harv. Bus. Rev.* 59–67. March–April 1995.
- Kotter, J.P., Schlesinger, L.A., 2008. Choosing strategies for change. *Harv. Bus. Rev.* 130–139. July–August 2008, (Reprint of original article from 1973).
- Lambrechts, W., Ceulemans, K., 2013. Sustainability assessment in higher education: evaluating the use of the auditing instrument for sustainability in higher education (AISHE) in Belgium. In: Caeiro, S., Leal Filho, W., Jabbour, C., Azeiteiro, U. (Eds.), *Sustainability Assessment Tools in Higher Education Institutions. Mapping Trends and Good Practice Around the World*. Springer, pp. 157–174.
- Lambrechts, W., Mulà, I., Ceulemans, K., Molderez, I., Gaeremynck, V., 2013. The integration of competences for sustainable development in higher education: an analysis of bachelor programs in management. *J. Clean. Prod.* 48, 65–73.
- Lambrechts, W., Van den Haute, H., Vanhoren, I., 2009. *Duurzaam hoger onderwijs. Appel voor verantwoord onderrichten, onderzoeken en ondernemen* (Sustainable higher education. Appeal for responsible education, research and operations). Leuven, LannooCampus.
- Lewin, K., 1951. *Field Theory in Social Science*. New York.
- Lewis, L.K., et al., 2006. Advice in communication during organizational change. The content of popular press books. *J. Bus. Commun.* 43 (2), 113–137.
- Lozano, R., 2006a. Incorporation and institutionalization of SD into universities: breaking through barriers to change. *J. Clean. Prod.* 14, 787–796.
- Lozano, R., 2006b. A tool for a graphical assessment of sustainability in universities (GASU). *J. Clean. Prod.* 14, 963–972.
- Lozano, R., Peattie, K., 2011. Assessing Cardiff University's curricula contribution to sustainable development using the STAUNCH (RTM) system. *J. Educ. Sustain. Dev.* 5 (1), 115–128.
- Lozano, R., 2012. Are companies planning their organisational changes for corporate sustainability? An analysis of three case studies on resistance to change and their strategies to overcome it. *Corp. Soc. Responsib. Environ. Manag.* Published online in Wiley Online Library wileyonlinelibrary.com 10.1002/csr.1290.
- Lozano, R., Ceulemans, K., Seatter, C.S., 2015. Teaching organisational change management for sustainability: designing and delivering a course at the University of Leeds to better prepare future sustainability change agents. *J. Clean. Prod.* 106, 205–215.
- Lozano, R., Lozano, F., Mulder, K., Huisingsh, D., Waas, T., 2013a. Advancing higher education for sustainable development: international insights and critical reflections. *J. Clean. Prod.* 48, 3–9.
- Lozano, R., Lukman, R., Lozano, F.J., Huisingsh, D., Lambrechts, W., 2013b. Declarations for sustainability in higher education: becoming better leaders, through addressing the university system. *J. Clean. Prod.* 48, 10–19.
- Lozano, R., Lobet, J., Tideswell, G., 2013c. Developing a University sustainability report: experiences from the University of Leeds. In: Caeiro, S., Leal Filho, W., Jabbour, C., Azeiteiro, U. (Eds.), *Sustainability Assessment Tools in Higher Education Institutions. Mapping Trends and Good Practice Around the World*. Springer, pp. 189–204.
- Lukman, R., Glavic, P., 2007. What are the key elements of a sustainable university? *Clean Technol. Environ. Policy* 9 (2), 103–114.
- Mazhar, M.U., Bull, R., Lemon, M., Mallaburn, P., 2014. The current state of strategic carbon management within the UK higher education sector: leading the way forward?. In: *Proceedings of the 9th International Symposium on Sustainable Leadership*, 3–6 June 2014, Salzburg, Austria, pp. 148–160.
- Newman, J., 2012. An organizational change management framework for sustainability. *Greener Manag. Int.* 57, 65–75.
- Pardo del Val, M., Martínez Fuentes, C., 2003. Resistance to change: a literature review and empirical study. *Manag. Decis.* 41 (2), 148–155.
- Pettigrew, A.M., Whipp, R., 1991. *Managing Change for Competitive Success*. Blackwell, Oxford.
- Post, J.E., Altman, B.W., 1994. Managing the environmental change process: barriers and opportunities. *J. Organ. Change Manag.* 7 (4), 64–81.
- Roorda, N., 2002. Assessment and policy development of sustainability in higher education with AISHE. In: Filho, W.L. (Ed.), *Teaching Sustainability at Universities: Towards Curriculum Greening, Environmental Education, Communication and Sustainability*. Peter Lang, Frankfurt.
- Schein, E.H., 1988. *Organizational Culture*. Sloan School of Management, MIT, USA.
- Schein, E.H., 2004. *Organizational Culture and Leadership*, third ed. John Wiley and Sons, San Francisco, USA.
- Seidel, M., Tedford, D., Seidel, R., Cross, R., Wait, L., 2009. SME strategy framework for environmental sustainability. In: *Proceedings of the 16th CIRP International Conference in Life Cycle Engineering*, 4–6 May 2009 Cairo, Egypt.
- Senge, P.M., 2006. *The Fifth Discipline. The Art & Practice of the Learning Organization*. Doubleday, Random House Inc., USA.
- Senge, P.M., Smith, B., Kruschwitz, N., Laur, J., Schley, S., 2008. *The Necessary Revolution. How Individuals and Organizations Are Working Together to Create a Sustainable World*. Doubleday, US.
- Shriberg, M., Tallent, H., 2003. *Beyond Principles: Implementing the Talloires Declaration*. Paper presented at Greening of the Campus V: Connecting to Place, September, 2003, Ball State University, Muncie, Indiana, USA. Available online at: <http://www.ulsf.org/pdf/ShribergTallentFinal.pdf>.
- Shriberg, M., Harris, K., 2012. Building sustainability change management and leadership skills in students: lessons learned from "Sustainability on campus" at the University of Michigan. *J. Environ. Sci.* 2, 154–164.
- Smith, I., 2005. Continuing professional development and workplace learning 13. Resistance to change – recognition and response. *Libr. Manag.* 26 (8/9), 519–522.
- Spira, F., Tappeser, V., Meyer, A., 2013. Perspectives on sustainability governance from universities in the USA, UK, and Germany: how do change agents employ different tools to alter organizational cultures and structures. In: Caeiro, S., Leal Filho, W., Jabbour, C., Azeiteiro, U. (Eds.), *Sustainability Assessment Tools in Higher Education Institutions. Mapping Trends and Good Practice Around the World*. Springer, pp. 175–188.
- Spreitzer, G.M., 1995. Psychological empowerment in the workplace: dimensions, measurement, and validation. *Acad. Manag. J.* 38 (5), 1442–1465.
- Stephens, J.C., Graham, A.C., 2010. Toward an empirical research agenda for sustainability in higher education: exploring the transition management framework. *J. Clean. Prod.* 18, 611–618.
- Stone, L.J., 2006. Limitations of cleaner production programmes as organizational change agents. II Leadership, support, communication, involvement and programme design. *J. Clean. Prod.* 14, 15–30.
- Struckman, C.K., Yammarino, F.J., 2003. Managing through multiple change activities: a solution to the enigma of the 21st century. *Organ. Dyn.* 32 (3), 234–246.
- Sylvestre, P., Wright, T., Sherren, Kate, 2013. Exploring faculty conceptualizations of sustainability in higher education: cultural barriers to organizational change and potential solutions. *J. Educ. Sustain. Dev.* 7 (2), 223–244.
- UNEP DTIE, DfS TU Delft, 2009. *Design for Sustainability. A Step-by-step Approach*. UNEP, Paris, France.
- Velázquez, L., Munguia, N., Platt, A., Taddei, J., 2006. Sustainable university: what can be matter? *J. Clean. Prod.* 14, 810–819.
- Verhulst, 2012. *The Human Side of Sustainable Design Implementation from the Perspective of Change Management*. Doctoral thesis. University of Antwerp, Belgium, ISBN 978-90-5728-353-6.
- Verhulst, E., Boks, C., 2012. The role of human factors in the adoption of sustainable design criteria in business: evidence from Belgian and Dutch case studies. *Int. J. Innov. Sustain. Dev.* 6 (2).
- Verhulst, E., Boks, C., Dewit, I., 2012. Chapter 3: implementation of sustainable innovations and business models. In: Wagner, Marcus (Ed.), *Entrepreneurship, Innovation and Sustainability*. Greenleaf Publishing, UK, pp. 32–66.
- Waddell, D., Sohal, A.S., 1998. Resistance: a constructive tool for change management. *Manag. Decis.* 36 (8), 543–548.
- Wals, A.E.J., 2010. Mirroring, Gestalt-switching and transformative social learning: stepping stones for developing sustainable competence. *Int. J. Sustain. High. Educ.* 11 (4), 380–390.
- Wiesner, R., Chadee, D., Best, P., 2011. Insights into sustainability change management from an organizational learning perspective: learning from SME sustainability champions. In: *10th International Research Conference on Quality, Innovation & Knowledge Management*, 15–18 Feb 2011, Kuala Lumpur, Malaysia.
- Wright, T., Horst, N., 2013. Exploring the ambiguity: what faculty leaders really think of sustainability in higher education. *Int. J. Sustain. High. Educ.* 14 (2), 209–227.