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The power of art to foster systems thinking, one of the key competencies of education for sustainable development

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ABSTRACT

Systems thinking is one of the most difficult competencies for students to acquire. Nevertheless it is one of the key competencies of education for sustainable development. Although there is relatively little research available on the link between didactic approaches and sustainability competencies, it is clear that alternative ways of teaching, such as project based learning and multi-perspective and interdisciplinary thinking and working are more effective for acquiring this competency. In this paper we explore the power of art as a way to foster systems thinking and to distinguish between different ways of thinking about sustainability. We selected two paintings, *Les Jours Gigantesques* by René Magritte and *Sky and Water II* by Maurits Escher, to explain a top-down and bottom-up approach to sustainability. The paper discusses how business students respond to art in a course on corporate social responsibility and how it helps them to understand the meaning of systems thinking. The findings reveal that these paintings are relevant for improving the comprehension of concepts related to sustainability. Moreover, they add an extra dimension to the cognitive understanding of systems thinking, i.e. enriching the whole person, reinforcing critical and creative thinking skills.

1. Introduction

> *"Behaviour change requires, among other factors, emotional engagement and passionate commitment. Education for sustainability needs to seriously contend with this basic human fact. Cognitive understanding alone is not sufficient; managers and students need holistic, physical and emotional engagement with sustainability issues".* (Shrivastava, 2010: 433)

While the need for education for sustainable development (ESD) has been recognized globally, among other things through promotion by UNESCO's Decade of Education for Sustainable Development (DESD) (Rieckmann, 2012; Disterheft et al., 2013; Wals, 2014; UNESCO, 2016), non-traditional views on how to achieve ESD are nearly absent in the literature. The quote by Paul Shrivastava, Professor in Management at Concordia University, Canada, represents a non-traditional view of how students and academics alike can learn about sustainability within a management education context. Shrivastava's (2010) bold and seminal article "Pedagogy of Passion for Sustainability" in *Academy of Management Learning and Education*, a high quality traditional management education journal, states that learning about sustainability requires "combining analytical, physical and spiritual concepts and practices into a holistic learning experience" (Shrivastava, 2010: 477).

Awareness of the interconnectedness of systems and of increasing complexity is growing. Wicked problems, such as climate change, desertification and poverty (Blok et al., 2015), are affecting everybody in spite of where they take place. Education plays an important role in the process of raising awareness of sustainability and how to respond to these challenges. Acquiring sustainability competencies is a way to address these complex issues. Rieckmann (2012) investigated which key competencies are the most vital ones and should be fostered at higher education institutes. Based on a Delphi study, a panel of experts agreed that the competencies for systemic thinking and handling complexity were fundamental for students to be able to understand contemporary societal challenges and to shape a more sustainable world. Being one of the most important sustainability competencies, systems thinking is also the most difficult one for students to acquire (Mingers, 2015). Despite the limited research on the link between

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didactic approaches and sustainability competencies (Sprain and Timpson, 2012; Waas et al., 2012), alternative ways of teaching, such as project based learning, service learning, multi-perspective and interdisciplinary thinking and working are more effective for acquiring these competencies (Holgaard et al., 2016; Scarff Seatter and Ceulemans, 2017; Molderez and Fonseca, 2018). However, non-traditional ways of acquiring such competencies, for example through the use of spiritual and/or creative concepts, have not been explored in empirical studies and are rare in management education (Dyllick, 2015; Shrivastava, 2010; Shrivastava et al., 2012).

Because of the high complexity of sustainability, changing towards sustainability generates intense emotions. The ambiguity of sustainability, its long-term perspective, adds to uncertainty. Artists have the gift of making the unknown visible, of criticising what is happening in the world, of integrating complexity. Since these are all competencies that are needed to make a transition to a more sustainable society, a lot can be learnt from art. As Olsen (2013: 144) explains, "Arts play three essential roles in sustainability projects: They focus our attention; they help us become comfortable with uncertainty, practising the edge (of not-knowing); and they help us feel. As we feel we care, becoming caretakers of body, caretakers of place". A deep or radical change (Wheeler, 2007) towards sustainability is still too often absent because of the characteristics of scientific knowledge, i.e. the disconnect between emotions and passion, uncertainty in scientific findings that confuses non-scientific users and the study of extremely narrow topics (Shrivastava et al., 2012; Harriss, 2009). Related to this is the disconnect between system and environment, i.e. the tendency to see system and environment as two distinct parts, which prevents us from achieving radical change (Molderez, 2007). Art can help us to focus again on the connections between system and environment.

Shrivastava et al. (2012: 33) refer to different areas where art is used as a vehicle for a sustainable transformation, such as healthcare, law and justice, management education and training, sustainability design and sustainability education. Moreover, they suggest that "sustainable art, within and beyond the classroom, can be highly effective in developing systems thinking" (2012: 35). Within management education, bridges between sustainability and the arts disciplines are rare. Walsch and Powell (2017) report on the development of an arts-based MBA programme between Birkbeck, University of London's business school, and Central Saint Martins, University of the Arts, London. The interdisciplinary MBA was established to better respond to emerging global problems and to expose the students to different perspectives and epistemologies from the ones that are offered in traditional MBAs. In Finland, Aalto University offers a Master in Creative Sustainability, which is a co-operation between the School of Business, the School of Engineering, and the School of Arts, Design and Architecture (Aalto, 2017). It is unique of its kind in terms of its interdisciplinary set-up and offers a learning platform for students to deal with a number of sustainability challenges through a holistic approach, including the arts.

In this paper, we want to explore the power of art as a way to foster systems thinking, to distinguish between different ways of thinking about sustainability and to offer students possibilities for enriching the whole person, in line with Shrivastava's (2010) pedagogy of passion for sustainability. The study undertaken in this paper analyses and discusses how students from a faculty of economics and business management respond to art used in a course on corporate social responsibility (CSR) and whether and how it helps them to understand the meaning of systems thinking. The aim is not to detect a causal relationship between art and fostering systems thinking. Art is perceived as a way to enrich the whole person. The study is explorative since it is a relatively new topic. The relevance of this research perspective is shown in the literature review on systems thinking and sustainability management research by Williams et al. (2017). A revolution in mind-sets is needed in order to be able to transform business and society. However, most of the published articles on this topic are focused on social-ecological systems and few include education, an essential vehicle to assist in changing behaviour.

In the following sections, a literature overview will be provided on sustainability competencies and systems thinking, on bottom-up/top-down views on sustainable development, and on ESD and the use of art. Subsequently, an exploratory case will be presented on the use of paintings to explain different approaches to the system/environment relationship and how it added to a holistic learning experience for the students. The paper concludes with an analysis and discussion on the use of art to convey systems thinking, one of the most relevant key competencies for sustainable development, and how it encourages critical reflection and creative thinking.

2. Literature

2.1. Sustainability competencies and systems thinking

There has been ample discussion on the importance of the acquisition of competencies in the literature, but nevertheless, there is no agreement on what competencies actually are (Barth et al., 2007). According to Barth et al. (2007: 417), competencies may be characterised as "*dispositions to self-organisation, comprising different psycho-social components, existing in a context-overlapping manner, and realising themselves context-specifically. They may be acquired gradually in different stages, and they are reflected in successful actions.*" Rieckmann (2012: 129) added to this broad definition that "they are an interplay of knowledge, capacities and skills, motives and affective dispositions".

As opposed to the culture of learning via strict knowledge acquisition through traditional teaching (or "indoctrination" as described by Barth et al., 2007), Lambrechts et al. (2013) stated that competencies-based education focuses on the ability of students to develop important knowledge, skills, values, and attitudes, necessary to address complex issues they will encounter in their future personal lives and professional careers. Translated to the field of ESD, the use of competencies for sustainability can be seen as a way for HEIs to address complex sustainability challenges by setting key educational goals (formed as a combination of skills, capabilities, knowledge, values etc.) for sustainability within the curriculum.

Within the ESD literature, different authors have developed their own lists of competencies for sustainability and/or investigated the use of sustainability competencies in curricula. For example, Wiek et al. (2011) compiled a list of sustainability competencies from selected peer-reviewed articles, and concluded that a combination of the following competencies in academic programmes enables students to engage in sustainability: systems thinking competencies; anticipatory competencies; normative competencies; strategic competencies; and interpersonal competencies. Other often mentioned SD competencies are, for example, centred around building a future orientation or the ability to take action for sustainability (e.g. by de Haan, 2010; Sleurs, 2008; Roorda, 2010).

Although it is important for students to acquire each of these sustainability competencies, research by Lambrechts et al. (2013) and Cortés et al. (2010) showed that in particular systems thinking, future thinking, personal commitment and action taking are virtually absent in many study programs of HEIs. Our article will focus on the use of the systems thinking competency.

According to Wiek et al. (2011: 2007), "systems thinking

competency is the ability to collectively analyse complex systems across different domains (society, environment, economy, etc.) and across different scales (local to global), thereby considering cascading effects, inertia, feedback loops and other systemic features related to sustainability issues and sustainability problem-solving frameworks". A systems thinking approach stresses the dynamic interconnectedness between humans and non-humans. The interdependence between different parts makes the systems thinking competency very important. As Arnold and Wade (2015, p. 670) illustrate, "everything from Canadian logging to Middle-Eastern oil drilling to Australian diamond mining will produce ripple effects throughout the globe". Businesses are confronted by sustainability challenges in their everyday practice. Some examples include the scarcity of resources and the violation of human rights affecting business operations. The interconnectedness of business and sustainability calls for another way of thinking in the corporate world (Wesselink et al., 2015; Bocken et al., 2015). Wesselink et al. (2015) analysed which core competencies for CSR are relevant for CSR managers from four of the fifty largest global agri-food multinational organisations. In their research a list of nineteen core tasks was identified and grouped into four sets. Systems thinking was identified as being important for two core tasks. Only two competencies, i.e. embracing diversity and interdisciplinarity, were perceived as being necessary for all the four tasks.

Bocken et al. (2015) suggest a value mapping process as a way of stimulating a change in thinking to be able to address systemic challenges. Businesses must go beyond a unilateral approach that is only centred on narrowly defined financial goals. In line with Porter and Kramer (2011), in a business one should think about value creation for all stakeholder groups. The value mapping process is a practical tool that helps people to think about values that are captured, missed, destroyed and created for a range of stakeholders (Bocken et al., 2015). Emphasizing values relates to systems thinking and stresses the importance of others for the viability of one's own system. Knowing that business schools still teach within the framework of profit maximisation as the only goal for companies, adds to the importance of looking for ways to stimulate "sustainable business thinking", i.e. "a way of thinking in which business is viewed as a positive force, which contributes to society and the environment, while still generating a profit" (Bocken et al., 2015: 69). However, it is questionable whether a win-win approach fits into a "radical new insight" (Williams et al., 2017), and what businesses will do when there is nothing to win for themselves but only something for society, or vice versa (Kolk, 2003). Businesses are still positioned in the centre when systems thinking is explained from a management perspective: "organizations depend on the natural environment for inputs and organizational actions directly impact the natural environment through feedback loops" (Williams et al., 2017: 867). The other, like the environment, becomes relevant because it is needed for the survival of the business instead of appreciating the environment for what it is.

Despite the importance of systems thinking in dealing with the complexity of our world, this competency has not received a lot of attention in HEIs (Mingers, 2015; Williams et al., 2017). Moreover, in a study by Hesselbarth and Schaltegger (2014), alumni from the first 'Master of Business Administration Sustainability Management' did not specifically refer to systems thinking as a relevant competency for the daily activities of a CSR manager. This is surprising because sustainability issues are complex and affect several domains and scales calling for a systems thinking approach. One explanation for this omission could be that systems thinking is difficult to grasp. Arnold and Wade (2015: 675) define systems thinking as "a set of synergistic analytic skills used to improve the capability of identifying and understanding systems, predicting their behaviors, and devising modifications to them in order to produce desired effects. These skills work together as a system". The emphasis in this definition is on analysing with the aim of achieving better results, understanding, predicting and devising modifications. Fiksel (2012) provides an example of the physical world partitioned into three types of system: the environmental, industrial and societal system. The industrial system uses resources from the environmental system in order to meet demands from the societal system. The ecosystem provides goods and services of value to both industrial and societal systems. By protecting and restoring natural capital, industrial systems can create environmental value. The same goes for societal systems by providing governance mechanisms. In this example, the importance of value creation becomes prevalent. This conception of systems thinking acknowledges the linkages between the different parts, but still attempts to split a whole into different parts. Systems thinking is often seen as a problem-solving approach designed to address sustainability challenges (Fiksel, 2012; Arnold and Wade, 2015).

In this paper, we want to argue for a different approach to systems thinking and go beyond a focus on problems and orientation towards goals. Relying on the ideas of Whitehead (1929), Cooper (1993), Chia (1995, 1996a,b) and Naess (1973), we suggest a non-functionalist approach to systems thinking. The emphasis is on the parts, continuously moving and trying to create provisional wholes, and on the boundary that is not a separating force but a forming one (Molderez, 2007). Systems thinking then relates to our role in the world: how do we handle societal challenges, how do we organise in a sustainable way, and how is the relationship between system and environment built? It is more closely related to the mental models that influence the way we think and the way we do things (Maani and Cavana, 2000; Senge, 1990). This non-functionalist approach will be explained by referring to the origins of the concept of sustainable development.

2.2. Different views on sustainable development

According to Starke (1990: 8–9), it is unclear who first defined the concept of sustainable development. It was an important concept in the title of a key paper during the eighties, i.e. the World Conservation Strategy: Living Resource Conservation for Sustainable Development from 1980. This paper was jointly published by the International Union for Conservation of Nature and Natural Resources (IUCN), the United Nations Environment Programme (UNEP) and the World Wildlife Fund (WWF). Sustainable development was defined as follows: "For development to be sustainable it must take account of social and ecological factors, as well as economic ones; of the living and non-living resource base; and of the long term as well as the short term advantages and disadvantages of alternative actions" (Allen, 1980). Our Common Future, the report of the World Commission on Environment and Development (WCED) (1987: 43) made the concept generally known and widely used. Sustainable development was described by the WCED as: "a development which meets the needs of the present without compromising the ability of future generations to meet their own needs".

Sustainable development is an example of a concept that is mainly injected into our language system via politics. First, policymakers are familiar with sustainability; it is relatively unknown to other societal actors. Once the concept has found its place, it is influenced and transformed by unforeseen forces. These changes are not necessarily problematic, because a living concept is susceptible to changes. Attempts to fossilise ideas are doomed to fail, because: "the linguistic river never stops flowing" (de Sausurre, 1983: 139).

The definition of the WCED fits into a linear approach. Man is still at the centre of everything, but he needs to preserve nature out

of self-interest. The WCED originated out of a growing international concern about global environmental problems and the welfare gap between North and South. The idea was that these problems could only be solved by striving for sustainable development. The starting point was that economic and social development had to take place within the boundaries of the environment. Global sustainable development made a repartition of welfare necessary between North and South. During the follow-up conference in Rio de Janeiro in 1992, the United Nations Conference on Environment and Development (UNCED), Agenda 21 was created: an ambitious plan with measures for implementing sustainable development in the 21st century. The report asked rich countries to change their consumption and production patterns, because of their excessive demand on global resources. According to Agenda 21, space would be created for the South if rich countries made a smaller claim on the environmental space that is used. Successive conferences such as Rio+10, Rio+20, showed that the rich countries failed to realise the required objectives. Despite some progress, the goals required new time limits, such as the Millennium Development Goals (MDGs) to be reached by 2015, and the Sustainable Development Goals (SDGs) set to be realised by 2030 (UNDP, 2015).

From a linear perspective, the equal distribution of natural resources is the point of departure. The environment is seen as a given quantity, which should be equally divided among the so-called rightful claimants. Everyone is entitled to an equal part of the environment. This definition originates from a static way of thinking. A distinction is made between environment and people. On the one hand, a great deal of importance is attached to international co-operation, because environmental problems are not limited to the borders of one country. On the other hand, the boundary between environment and human beings, economy and ecology is maintained. Moreover, the idea is rejected that the boundaries between environment and man are a problem.

Sustainable development deals with the so-called wicked problems we face today, but we are only beginning to feel the consequences of man's actions on a large scale. If one takes problems as a starting point, one might react too late. Solving problems when they occur is a short-term policy, which contradicts the long-term perspective that is one of the foundations of sustainable development.

One often refers to a so-called implementation gap: the concept of sustainability is vague and the knowledge to realise sustainable development is lacking. Implementation as the next phase is required if one perceives sustainability as an objective. One needs to come up with steps for achieving this goal. Perceiving sustainability as an abstract ideal is more or less like a utopia, disconnected from everything. It is almost always considered to be an ending, something one can reach after progressing through different stages. Sustainability then fits into a framework of causality. When certain actions are taken, sustainability can be reached. After several steps have been taken, one comes closer to the goal. Finishing stresses a particular moment in time, the chronological end, the final point. However, after more than twenty years of reports and summits, the goals for reaching 'sustainability' have not been accomplished yet. Always setting new goals with new time limits might lead to limited levels of commitment.

Seeing a goal as an end allows for two views on sustainable development: as an objective or as an integral part of the system. The openness of an end emphasises completion and process, but also the possibility for an individual to add to the story during the very unfolding of the story. Williams et al.'s (2017: 871) idea of sustainability aligns with this conception: "Sustainability is not an end state that can be achieved, but a 'moving target' that is continuously changing and improving." Understanding sustainability as a process instead of as a goal simultaneously emphasises reflection and action.

Sustainability as a process corresponds to the actions of forest workers. In the beginning of the twentieth century, an association was made between the term sustainability and natural resources, but then it was only linked to forestry (Simpson and Weiner, 1989). Recknagel and Bentley (1919, in Simpson and Weiner, 1989: 327) wrote in *Forest Management* that: "By sustained yield is understood the yield or cut of timber from a forest which is managed in such a way as to permit the removal of an approximately equal volume of timber anually or periodically". In other words, it is the amount that can be periodically harvested without long-term depletion. This definition relates to the conception of language as based on the activity of people in a community (de Sausurre, 1983). Consider the well-known case of rubber tappers in 1980s in the Brazilian rainforest, led by Chico Mendez (Hochstetler and Keck, 2007). Using traditional knowledge, rubber tappers harvested rubber in a sustainable manner as opposed to conventional methods of the time that led to deforestation in the Amazon. Mendez used sustainable development in the sense of protecting the rainforest in a way that it was also beneficial to the poor, i.e. for local people in terms of income. In this way, the case is representative of a systemic approach to sustainable development. The rubber tappers were acting as a system that is *with* the environment. Sustainability was not perceived as a goal by them, but as part of their entire approach to tapping rubber. Their typical way of rubber tapping emerged from being in the midst of the forest. They were with the forest and did not see it as a resource to possess and to exploit. Being in the midst of activity made it difficult for them to make separations between people, planet, and prosperity. Sustainability occurred at the interface; it could not be seen in isolation. It was above all (in) activity and was something that never stopped. Acting directly in the midst of the forest produced a way of working that implicitly involved the idea of a process.

At that time, within a time span of one year, the rubber tappers in Brazil and the report by the Brundtland Commission received a broad range of media attention. Two different approaches to sustainability became visible. We label them top-down and bottom-up (Molderez, 2007), inspired by Cooper (1993) and Chia (1996a,b). A top-down approach to man's role in the world is one where man, in a metaphorical way, sits on top, above everything else, considering all as mere material at one's disposal. Man, like any other system, is *within* the environment, at the centre of everything. This position makes it easy to tell others what to do. Different steps are distinguished in order to be able to reach a goal that is determined beforehand. System and environment are identified as separate entities, which facilitates considering them as static, as entities that are finished, ready. The boundary between them functions as a way to separate the system from the environment. The emphasis within this way of thinking is on problem solving. One starts from problems that can and must be solved, which corresponds with Arne Naess's (1973) concept of shallow ecology.

A bottom-up approach implies essentially being *with* the environment, in togetherness. The boundary between the system and the environment is binding the two elements. This approach stresses the bond between the two. The boundary joins the two elements together. It shows that there is a link, a connection with something, with another. The bottom-up approach focuses on organising as a process of creating meaning in action and therefore makes the division between system and environment rather problematic. Everything starts at the bottom, or where the core of the activity of life is. When one is part of this activity, it becomes difficult to disentangle the different elements. One is trying to create a provisional whole. This whole is unknown and therefore impossible to define in advance. Naess's (1973) deep ecology is about constantly asking questions such as "is the way we live now

the way we want to live?"

Top-down and bottom-up go much further than the direction of the functional line between the top, i.e. the decision makers, and the bottom, i.e. the executers. The distinction is built on three key aspects. Firstly, it is about handling societal challenges: either from a problem-solving perspective or as a point of departure to reflect about how we are living today. Secondly, it tackles the question of how to organise in a sustainable way, not by telling others what to do within a certain time frame but by creating an outcome through acting together. This outcome is not known beforehand and cannot be defined in advance. The act of continuously trying to form a whole comes close to emergence and self-organisation (Williams et al., 2017). The main difference, however, lies in the way system and environment are perceived. They are two connected parts forming an unfinished whole instead of two separate entities, which leads to the third and last key aspect: the boundary. Considerable importance is attached to what is between the parts, i.e. a set of relations. What makes them moving and connecting are the relations between the parts. The boundary *bounds* the parts, i.e. forms them. The emphasis on what is *between* them is missing within a top-down way of thinking. How the boundary between system and environment is conceptualised is a pivotal means of distinguishing a top-down from a bottom-up way of thinking about sustainability, i.e. as a divisive force or as binding.

Table 1 summarizes the main characteristics of top-down and bottom-up, two ways of thinking about the relationship between system and environment, as described above.

2.3. Art-based learning in a context of sustainability

Despite propositions for demarcating sustainability (Bolis et al., 2014) perceiving sustainability within a bottom-up way of thinking calls for a change in mind-set: from problems to questioning, from goals coming from the top to being in the midst of, from a boundary between system and environment to a boundary as binding. Sustainability is then a value-based mind-set that is not easily acquired. Especially in a business context "a change in thinking from growth and efficiency to sustainability is difficult to embed" (Bathurst and Edwards, 2009: 3). A radical change requires a totally different approach. Some authors contend that creativity can challenge the dominant functionalist thinking based on linearity (Lozano, 2014; Mitchell and Walinga, 2017). Art can contribute to this because it offers "innovative approaches to address sustainability problems and facilitates collective deliberation, learning and transformation" (Lineberry and Wiek, 2016: 311). Moreover, art triggers people's emotions, makes systems and their interconnectedness visible and engenders hope, especially when art is created in a group (Ivanaj et al., 2014; Stucker and Bozuwa, 2012).

From their experience in using literature and theatre classes in business ethics teaching, Freeman et al. (2015: 522) notice that these creative arts are comparable to case studies in activating rich thinking, but additionally engage students in "deeper feeling and emotion". These creative arts provide "a deeper engagement of the self" because values and beliefs are more easily questioned. And this is precisely what is needed for a radical change towards sustainability. Taylor and Ladkin (2009: 56) stress that arts can help us to access and develop "a fundamentally different way of approaching the world than is embodied in the traditional tools of logic and rationality that have dominated management research and business education."

One can be inspired by art. Carlsson et al. (2015) refer to "sustainability jam sessions" as a way to create vision and solve problems. Like jam sessions in music and improvisations, different types of actors, who are representing different perspectives, form a group and bring new ideas and perspectives on challenging issues, relevant for the hosting organisation, that have to be solved. Based on a sustainability-oriented transdisciplinary review, Kagan and Kirchberg (2016) explored articles focusing on music and sustainability. They concluded that few sustainability experts research music as a way towards learning for sustainability despite the positive effects of group music practice on group cohesion.

Lineberry and Wiek (2016) provide examples of artists who collaborate with diverse stakeholders to reflect on, converse with and learn to develop concrete solutions. Artists are capable of doing that because they have the ability to combine mind and body, imagination and cognitive knowledge. Other models are needed to become engaged in a "deep change towards sustainability" (Wheeler, 2007: 46). Zsolnai and Wilson (2016) argue that art can challenge mainstream business operations to change towards sustainability. They refer to Illy Café and Brunello Cucinelli as art-based companies that are simultaneously engaged in creating art and socio-ecological value. For these two organisations art acts as a spiritual core to integrate sustainability practices. However, one has to be careful not to disentangle a causal relationship between art and sustainability, as for both companies the ethical and the aesthetic are integrated with each other. Nevertheless, "art and ecological sensibility" play a role in "inducing social change towards sustainability" (Zsolnai and Wilson, 2016: 1535).

According to Ivanaj et al. (2014), the emotion-charged and complex characteristics of sustainability call for non-classical ways of learning. The authors refer to methods of art-based learning because classical forms such as lectures or coursework are not adequate. Their artistic practice pedagogy focused on painting with the aim of collectively creating a vision and sustainable strategies. Through the use of their 3H-model of hand, heart and head, they emphasized that sustainability cannot be understood when the hand and the heart are not involved. One has to experience first, feel emotions and then a deeper understanding of sustainability can be reached. While Ivanaj et al. (2014) set up different workshops to develop an aesthetic practice pedagogy, this role can also be taken up by cultural institutions. Ernst et al. (2016) explored the role museums can play with their exhibits to inspire and generate a change towards sustainable development.

Adler and Delbecq (2017) plead for regularly engaging in reflection instead of only action. One way of integrating reflection is opening one's mind to sacred texts and paintings because they are "rich sources of inspiration and holistic meaning" (Adler and Delbecq, 2017: 3). Art enables one to combine heart, body and

Table 1
Top-down and bottom-up: two ways of thinking about the relationship between system and environment.

	Top-down	Bottom-up
Handling of societal challenges (Naess, 1973)	Problem solving.	Questioning, reflecting about the way we live now.
Origin of organising in a sustainable way (Based on Cooper, 1993)	From the top to the bottom: telling others what to do; goals as an ending.	Being in the midst of, where the action is; system and environment are connected parts, trying to create a provisional whole.
System/environment relationship (Based on Cooper, 1993)	System is *within* the environment; system and environment are separate entities; ready; the boundary is a divisive force.	System is *with* the environment, emphasis is on relations between system and environment; unready; the boundary is a forming force.

mind, to develop oneself as a holistic leader, "to become aware of a shift in consciousness or emotion" (Adler and Delbecq, 2017: 3). The link between art and holistic integration is not interpreted as a causal relationship, but as a mediator, as "an opportunity to escape the mundane ugliness of everyday life and to enter into your own and the artist's extraordinary world of imagination, creativity, generosity and beauty" (Adler and Delbecq, 2017: 6). Art is then a very powerful artefact to let people become aware of their role in society. It fosters reflection, awareness, and protest.

Taylor and Ladkin (2009) set up a typology of different arts-based processes. They disentangled four types of process in terms of individual development: making, skills transfer, illustration of essence, and projective technique. The types are related to managerial and leadership development in general, but they are also very relevant for sustainable management and being a sustainable leader in particular. In their article they call for empirical data from arts-based methods and for making connections to real-life contexts. Sustainability could be this specific context. Building on Taylor and Ladkin (2009), 'skills transfers' refer to particular skills that can be learnt from art and applied to the sustainable management of organisations. 'Projective technique' fosters reflection through projection. It can make invisible concepts such as a sustainable culture visible. 'Illustration of essence' uses art to show essential aspects of sustainability and afterwards guides action. And finally 'making' is about creating art, while allowing for the possibility of reflecting on one's own feelings about sustainable events.

Although visual literacy is primarily related to art history and media studies, for Palmer (2015) it is a prerequisite for every academic discipline. Visual symbols make up the world (Seglem and Witte, 2009). Despite the power of images, the dominant form of communication is still speech and written text. According to Rorani (2015: 10), this has to do with habits and education: "using pictures is not how we do it in the serious world of grown-up communication". Referring to Braden and Hortin (1982) "Visual literacy is the ability to understand and use images, including the ability to think, learn and express oneself in terms of images" (Seglem and Witte, 2009: 217). Apart from the text that students need to read, adding visuals has a positive impact on the motivation, engagement and enjoyment of reading. Moreover, it improves understanding of the text and fosters critical reflection (Seglem and Witte, 2009; Dutrow, 2007). Visuals, such as the visual display of data in graphs or drawings in life sciences, are an essential component of scientific thinking (Dutrow, 2007; Fan, 2015). Using images helps people to think beyond the text. Fan (2015: 170) analysed how drawing interacts with "cognitive functions that are core to scientific thinking to support observation, problem-solving, explanation and communication." When asking students, over 60% prefer visuals as a learning style (Dutrow, 2007). Raworth (2017: 13) follows the same line of argument: "We learn best when there are pictures to look at". But, as Raworth (2017: 15) explains, there is also the other side of the coin: "What we draw determines what we can and cannot see".

Art can help to explore the meaning of a boundary between system and environment, i.e. as disconnecting, connecting or both. Shrivastava et al. (2012: 36) refer to James Baldwin, an American novelist, essayist, playwright, poet, and social critic, stating that "the purpose of art is to lay bare the questions that have been hidden by answers". Artists perform many roles in relation to sustainability. They are visualizers, implementers, conscience keepers, value-articulators, aesthetic sense developers, and complexity performers (Shrivastava et al., 2012). Great scientists often admit that most or all of their success is due to imagination. Not considering artists and writers as a possible source of inspiration is part of the construction of divisions between disciplines. In a transdisciplinary course, ideas are emphasized, regardless of their origin.

3. Exploratory study: using art in a course on corporate social responsibility

3.1. Presentation of the paintings used in class

In this article, we focus on two arts-based processes: 'skills transfer' and the 'illustration of essence' (Taylor and Ladkin, 2009). We selected two paintings by René Magritte and Maurits Escher to illustrate the essence of a boundary. Both painters were chosen because their paintings are well known for playing with the meaning of a boundary. With their paintings the importance of borders, which is very relevant in relation to sustainability, becomes visible. We used the paintings because of their power to inform, which is, according to Eisner (referred to by Finley, 2005), an important contribution made by art. As Gablik (1992: 14) explains, "it is the unexpected in Magritte's work which provides information, since what is fully expected tells us nothing". René Magritte disliked being called an artist. He preferred to be considered a thinker who communicated by means of paint. His paintings have gained recognition for problematising dualisms and boundaries. They are intellectually stimulating and an invitation to critically reflect upon the material world. Several paintings could have been chosen, but we opted for 'Les Jours Gigantesques', painted in 1928, because it is a relatively unknown picture by Magritte. Gablik (1992: 42) situates this painting in Magritte's first period, i.e. 1925–1930. All the paintings in this period are "melodramatic, bizarre and often macabre scenes …". For a long time *Les Jours Gigantesques* belonged to a private collection, but it has been analysed by Whitfield (1992) and Gablik (1992). *Sky and Water II* by Escher was relevant because of the mix of birds and fish, relating to nature. The paintings were previously explored to develop the concepts "organisation as body-in-contact" (Molderez, 2003) and "ecological thinking" (Molderez, 2007). Although arts are essential in promoting critical inquiry of environmental awareness and sustainability (Clark and Button, 2011: 42), Magritte and Escher did not paint for this purpose. Nevertheless, their paintings were very helpful for elaborating concepts relating to system/environment. In contradiction to Bathurst and Edwards (2009), we did not look for paintings in which the multifaceted challenges facing business leaders in the 21st century are reflected. Only one aspect is emphasized, but an important one. Sustainability is about how we relate ourselves to the world: as a system *within* the centre surrounded by the environment, or as a system *with* the environment, both trying to create a provisional whole in togetherness. Sustainability is focusing on the relationship between system (a company for example) and its environment. But this relationship can be one of dominance or of accepting diversity.

René Magritte's painting *Les Jours Gigantesques* from 1928 (see Fig. 1) is a source of inspiration and a safeguard for the ideas developed about a bottom-up approach of sustainability. Man and woman symbolise system and environment. As Molderez (2003: 47) explains: "It shows how difficult it is to make a division between two entities, in this case man and woman. Although one can see that it is about a man and a woman, it is unclear where the woman ends and the man begins. The joining between the two makes this undecidable. The function of the boundary is not to separate man and woman. It symbolises that they share something, a *being together*. They are not really the same, nor completely different. According to Deleuze and Parnet (1989: 3), "it is *the woman-becoming of man* and *the man-becoming of woman*. This does not imply that man and woman result in a kind of hybrid, or something in-between, which is also a no-thing. We know man and

Fig. 1. *Les Jours Gigantesques* by René Magritte (Whitfield, 1992).

woman only through the relationship between them. Both are in interplay with each other. *The other* is important and necessary." So the painting clearly shows that it is about system *with* the environment. Both are needed at the same time.

The importance of the boundary is also illustrated in Maurits Escher's symmetry work *Sky and Water II* (see Fig. 2). Molderez (2007) uses this painting to illustrate the function of the boundary as binding. The painting is "characterised by a play between foreground and background. Not only the oscillation between foreground and background is intellectually stimulating. Foreground becomes background and background foreground where the contours of birds and fish are, where they meet, or where the border is" (Molderez, 2007: 386). The border does not belong to the one or the other, but forms the two. A bottom-up approach is again visible. The fish is with the bird. The fish is formed by the touching of the bird and vice versa. Each needs the other in order to be able to exist. A boundary within a bottom-up approach is not a split between two entities, but a way to connect, to form and to give meaning to two parts that are trying to form a provisional whole.

3.2. Research methods

The exploratory study discussed in this paper was carried out in the academic year 2016–2017 with students attending the course Corporate Social Responsibility in three different programmes at KULeuven University, Faculty of Economics and Business in Belgium:

- Master of Environmental, Health and Safety Management (EHS) (where CSR was a 45-hour compulsory course);
- Master of Business Administration (MBA) (where CSR was a 30-hour elective course); and

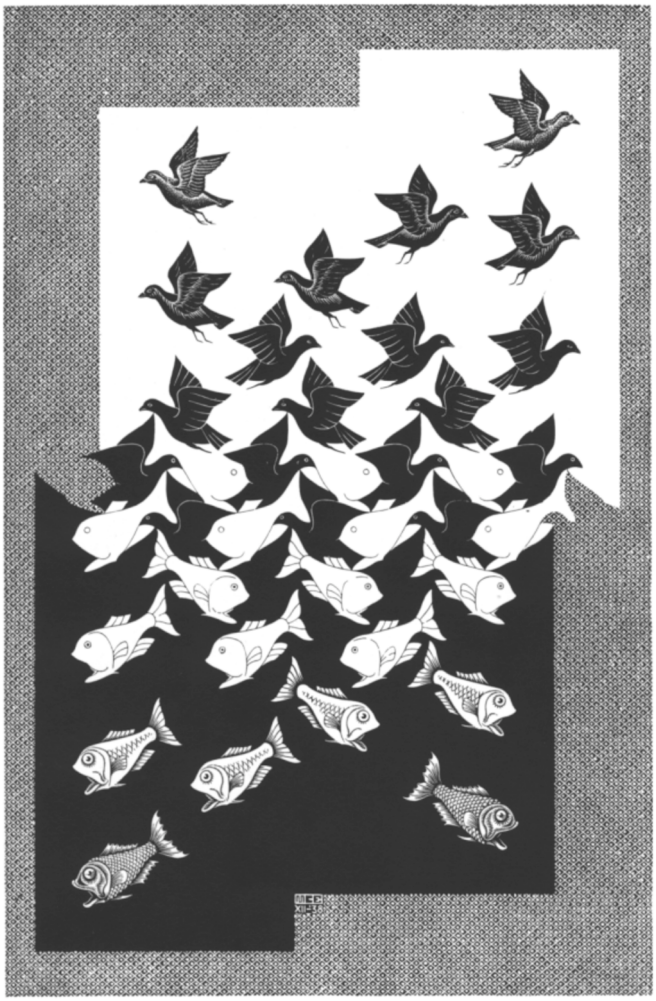

Fig. 2. *Sky and Water II* by Maurits Escher (Escher, 1990).

- Master of Science in International Business Economics and Management (MIBEM) (where CSR was a 30-hour compulsory course).

Each programme had its own CSR course, taught by a different professor. However, from time to time, the MBA and MIBEM students had joint classes. The three courses were also open for students from other study programmes, including Erasmus students.

Registering for the courses is not the same as participating because at KULeuven University students are not obliged to attend the courses they enrol in. In total, 306 students registered for the CSR courses: 24 students for the EHS Programme, 156 for the MBA Programme, and 126 for the MIBEM Programme. The number of students participating in the survey corresponded with the average student attendance at the courses: 19 students from the EHS Programme, 52 from the MBA Programme, 47 from the MIBEM Programme and 4 from other study programmes. The students were encouraged to participate in the study, yet participation was not mandatory. In total, 122 students participated in the study. Relative to the number of students registered for the CSR courses, this is a response rate of almost 40%. The respondents formed a very diverse group because of the different programmes they were enrolled in:

- age: 50% of the students were less than 25 years old, 50% were between 25 and 38;
- gender: more than 60% were female;

- residence: more than 80% were Belgian residents, but nationalities varied, e.g., Turkey, Brazil, The Netherlands, Spain, Finland, South Africa, Vietnam, Peru;
- previous degrees: more than 80% had obtained another degree apart from business degrees, e.g., Philosophy, Engineering, Law, Languages, Arts, Politics, Architecture.

The students were exposed to paintings during their class on the topic of 'bottom-up and top-down perspectives on sustainability'. For the EHS Programme, this theme was a compulsory topic in the CSR course. The same content was provided to the students of the MBA and MIBEM Programmes during their CSR class, but only with the aim of involving students in the research. The different purpose of the lecture might have had another effect on the answers. The largest group of students might have been less prejudiced because the content of the lecture did not form part of their exam.

After the lecture, the students were invited to participate in a survey by using their laptop or smartphone. *Qualtrics Research Suite* was used to build the survey and to organise the data collection. Mainly close-ended questions were included in the survey to inquire to what extent the students agreed with a number of different statements. A seven-point Likert scale was used, with answers ranging from 'strongly agree' to 'strongly disagree'. For the sake of clarity, two categories were grouped into one in the analysis: 'disagree' and 'somewhat disagree' to 'disagree', and 'agree' and 'somewhat disagree' to 'agree'. Because close-ended questions evoke limited meaning, the students were also invited to explain their answers through a number of open-ended questions. These extra open-ended questions provided rich answers, which were further studied through content analysis.

The main purpose of the survey was to inquire about the students' experience with using art in their study programme, how relevant it was in relation to CSR and systems thinking, and what they learnt from the specific paintings used in class. In particular, we wanted to find out how this approach enhanced their understanding of systems thinking. The main limitations of using a survey for this study are threefold. First, since there is a lack of prior research on the topic of using arts in management education, we took an exploratory approach, focusing on the experiences of the students with the inclusion of art in class. The survey only offers us some initial data on the topic, which we use to illustrate our arguments and to gain insight into how art is received by students enrolled in a management programme. Students of these types of programme might be less responsive to using visuals in comparison with courses on language (Seglem and Witte, 2009) or specialised courses like 'Falling from Infinity' (Palmer, 2015), despite the urge for visual literacy as a critical skill for the twenty-first century. A survey is an efficient method when the respondents form a large group. Interviews would have been equally relevant to gaining insight and even more appropriate for offering a more nuanced discussion, but this shortcoming has been tackled by giving the students ample opportunities for open-ended questions in the survey. Second, through this survey, we are assessing perceptions on the use of art in class, rather than measuring actual learning effects. This implies that we cannot determine a causal relationship between the use of art and learning effects, but this is not the intention of our study. Measuring competencies is in itself already challenging, even without using art (Ceulemans et al., 2011). A third limitation is the fact that perceptions of the use of art in class, as well as the learning effects, may change over time. Therefore, it should be taken into account that the students' perceptions were assessed right after the class. Since the use of art requires more time to process and to rethink, their perceptions may differ in the long run and so a follow-up survey may be required.

3.3. Receptiveness of students to art during a CSR course

The survey was structured into three main parts: personal data, the relevance of art, and the appreciation of the paintings by Magritte and Escher for a better understanding of systems thinking.

Using art to explain different approaches to sustainability is not widely practised in courses on sustainability. The specific programme the students were enrolled in, and the previous degrees they obtained, defined their experience with art in the classroom. Using art in courses was not new for the Belgian students of the EHS Programme. They referred to the use of art during courses such as cognitive ergonomics, ethics, philosophy and psychology. Psychology courses in particular often deal with the act of suppression and perception, something that is easily shown by images. For the students enrolled in the MBA and MIBEM Programme, art had been used in another course for 35% of the students. They mentioned courses that were already closely related to art such as social dynamics, archaeology, history, or human resources management.

The Erasmus students who participated in the survey did not have any previous experience with the use of art in their courses, but they were much more inclined to see the relevance of it for elaborating on specific CSR concepts: 70% agreed that the paintings were a relevant way to explain these CSR topics. A similarly high number could be noted for the MBA and MIBEM students, i.e. 68%. For the Belgian EHS students this was 50%. From the open-ended questions, it became apparent that students especially valued the paintings because of their potential to help them understand the concepts better. They also appreciated this unusual way of teaching. In addition, art was helpful for showing different points of view.

> "If the painting is relevant to the topic in any way, it could be useful to bring it up. It initiates conversation and makes the topic very memorable because you have a certain picture in your head that you associate with this topic."

> "Using paintings can help students visualize and engage more deeply with a certain issue, since art is often about transmitting emotions."

> "Art is metaphorical and helps to understand the topics from another perspective."

Nevertheless, not all the feedback on the use of art during class was positive:

> "I don't think these paintings are appropriate if talking about CSR in a scientific way. However, if reaching people through art is the goal, it could be a good way of doing that. But I see this kind of painting in an exhibition related to CSR, not in a classroom."

> "This is debatable as it makes CSR seem like a 'soft' subject."

Most of the critical feedback was related to assessing the scientific value of using art to explain CSR topics. For example, the question arose as to whether using art is 'scientific' enough as a means of putting across certain theories from the literature.

The perception of the students around the relevance of art to fostering systems thinking is shown in Fig. 3. The three questions referred to three aspects of systems thinking. Each time the question was "To what extent do you agree? Using paintings is very relevant (1) to explain different ideas about the system/environment relationship; (2) to get an idea of thinking in patterns and relationships rather than in isolated elements and parts; and (3) to improve my understanding of the interactions between system and environment."

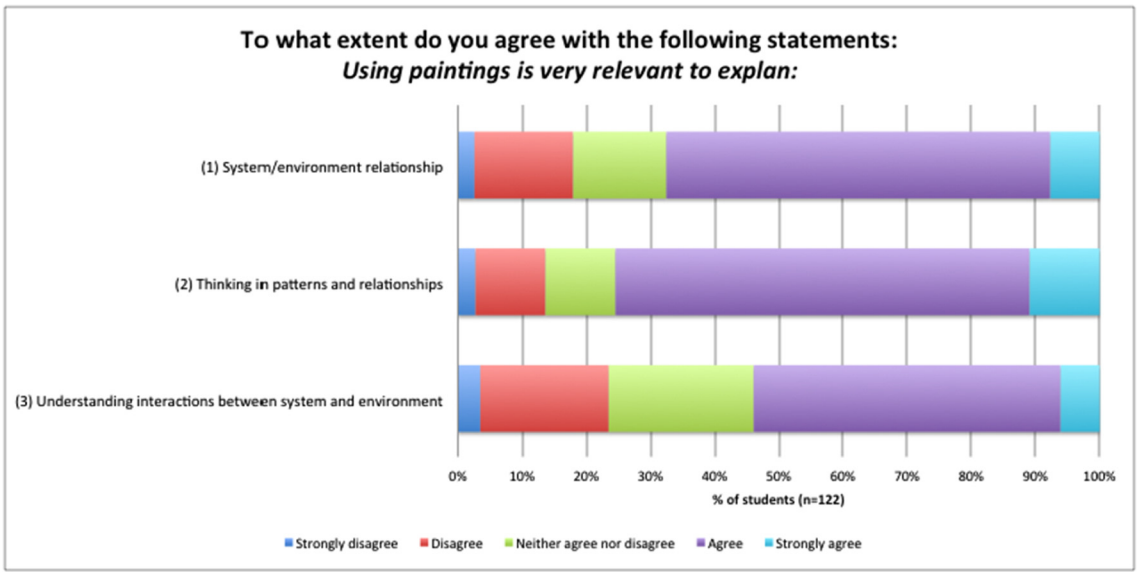

Fig. 3. The use of art to foster systems thinking.

For the three aspects of systems thinking the majority of students agreed that art can be very relevant (Fig. 3). The students were also very eager to explain their answers further in the open-ended questions; more than fifty comments were noted for each question. The students found the paintings relevant because they helped them to better understand these three aspects of systems thinking. In particular, thinking in patterns rather than in isolated elements and parts became more understandable thanks to the paintings: "Art is very much about patterns and the absence of it, so it makes sense to use it". The paintings were also well received because they visualised the boundary and how system and environment are connected with each other: "There is a fine line and instead of dividing, you integrate". However, when it becomes too complex, paintings cannot give a full view. This was the case for using the paintings to understand the interactions between system and environment: "Interactions are often a complex given, a painting might not be able to give a full view of the interaction".

Students related the relevance of the paintings particularly to the alternative way of teaching, e.g.: "The paintings are not necessary, but I appreciate art so it was a pleasant surprise". Other students noted the following:

> "Art can show the topics/problems from an alternative perspective."
>
> "I would not say it is relevant as pictures and other materials could have been used as well. However, I still do think it is a very refreshing/innovative way of teaching."
>
> "Very useful, again because of the visualization and easy method of recognition to understand a certain aspect. Plus art is an important aspect that people should be aware of."

According to some students, visualizing a concept makes it easier to understand the concept, provided that the painting is explained beforehand. Other students argued that because art can be interpreted in different ways, it can be very useful to learn how to think critically. Because art allows using the most creative part of the brain, integration of art into courses can lead to other perspectives.

Nevertheless, some comments were more negative about the relevance of art to teaching about systems thinking. A minority of students was not convinced of the value of arts, and argued that it is not good to use art because of its many interpretations. According to these students, this adds to the confusion around the topic. They also argued that art is not accessible for students who are not creative.

> "Paintings can be used to explain ideas about the environment, however I find other tools more relevant and connected with the topic, as pictures about what is really happening in the world have more impact."
>
> "As long as it can clearly explain the differences I don't have any preferences concerning the media used in lectures."
>
> "I think pictures and data are more relevant when talking about problems and explaining ideas. Paintings make the subject too mysterious."

According to the students, *Sky and Water II* by Escher was more complementary to the course topic than *Les Jours Gigantesques* by Magritte. For both paintings we asked the same question: "To what extent do you agree: The painting by (1) Magritte and (2) Escher made me see the complexity of system/environment relationships." Students found *Sky and Water II* the easiest to link to the complexity of system/environment relationships (see Fig. 4). The main reason was that the types of paintings Escher produces (which are in general less abstract than the ones of Magritte) are easier to understand, and as one student explained, "all the elements and relationships are captured in one painting". Magritte's painting was appreciated as an eye-opener, and a helpful way to better understand the different elements of top-down/bottom-up. It also showed that "the boundaries between environment and system are not very clear", and "how complex the relationships are between system and environment".

When asked about their first reaction when seeing *Les Jours Gigantesques*, the students all responded very differently, i.e. from "Shock because of nudity", or "Kind of confusing to me", to "See the binding", "I was curious what the link would be with the theory", and "Very interesting". One student recommended using art that people already know because the unknown of the Magritte painting could have distracted attention from the concepts. For some students the painting was also very provocative: "Even after the

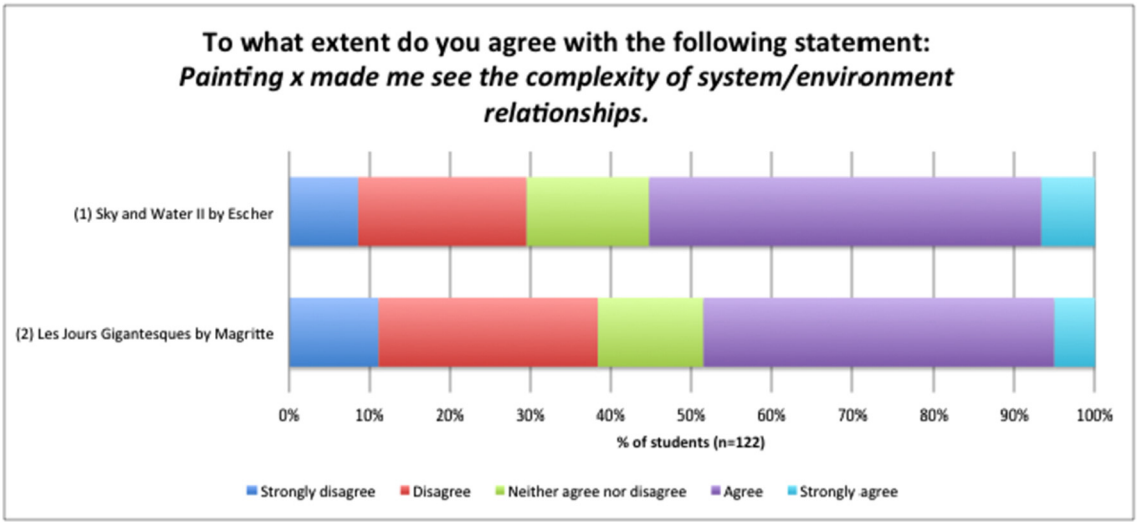

Fig. 4. Relevance of paintings to see the complexity of system/environment relationships.

explanation, I didn't fully understand the painting. For me personally it is a very strange painting. My first impression was that the man is harassing the woman".

The first reactions when *Sky and Water II* was shown and explained, were more converging:

"I had never seen such usage of art pieces. That's why I found it very interesting. We can understand issues or circumstances about a topic by reading articles or books but art can awaken some feelings toward a subject which can be more effective to lead to behavioural change."

"The first thing that came to my mind was evolution, and even though a fish and a bird look like two poles, in other words two extreme points, actually they are same"

"Escher's picture, on the contrary, was much more understandable. I was able to see clearly the link and the interrelation between all kinds of species"

The reactions of the students to this painting were generally more closely linked to the course content (e.g. evolution, interrelation between species, or behavioural change).

Overall, students were receptive towards using art in a CSR course:

"Art is always relevant. It also makes you think about a topic. To use art to make people think differently about CSR is a good idea".

Art can be used as an extra clarification. It has the ability to make a course more colourful and diverse:

"It is a very nice way to introduce subjects related to CSR. I was really impressed because I realized that art can teach us about a lot of different topics that I didn't think about before. Try to continue this work."

According to the students, painters may have opinions or contributions to make about sustainability and relationships, but not every piece of art can be used during a course. Therefore, the suggestion was made to only use relevant pieces of art from time to time. There must always be a link with the topic of the course because they are convinced that art must be of secondary importance. Some students also suggested asking the point of view of an artist instead of only using their pieces of art, or to allow more interaction by asking students about their interpretation before it is explained.

Despite the positive perceptions on the use of art during a CSR class, most students claimed that they did not change how they think about CSR in general after having seen the paintings. When asking the question 'Do you think in a different way about CSR after having seen the painting', 70% replied "no". Students were invited to explain their answer, which put this 'no' into another perspective:

"I do not think differently, but I do think more clearly about it now"

It hasn't changed my thoughts because that is not possible during such a short time."

"I think differently about the interpretation of the painting and its connection to CSR, but this does not change the way I perceive CSR itself. We could say that given its ubiquitous presence, CSR is even more relevant/important in almost any context."

"I already had so many thoughts about CSR and I feel like I already understood its complexity. This just added more to my view but didn't change it."

It should be taken into account here that the students are commenting on the overarching topic of CSR, which encompasses the entirety of the course (as opposed to systems thinking only, which was the topic of one class within this course). So while the paintings helped them to understand the concrete topic of systems thinking (see Fig. 4), it does not automatically imply that by using two paintings in one class they will directly change their views on the course as a whole (in the short run). The students were rather referring to the importance of CSR. They were already very engaged with CSR and the use of paintings did not change this.

4. Discussion

As argued by Dyllick (2015), Shrivastava (2010), Shrivastava et al.

(2012), and Zsolnai and Wilson (2016), using arts in understanding concepts of sustainability is still far from a mainstream activity within management education. Nevertheless, there are already some examples of arts-based approaches to teaching the skills needed by managers and leaders (Taylor and Ladkin, 2009; Adler and Delbecq, 2017) and in relation to sustainability (Ivanaj et al., 2014; Kagan and Kirchberg, 2016; Lineberry and Wiek, 2016; Shrivastava et al., 2012). KU Leuven students seem to be open to the use of paintings during their CSR class, and so may others be.

Among all the roles that art can play (Shrivastava et al., 2012), 'being a visualizer' was particularly mentioned by the majority of the students. More than words, paintings have the capacity to make a new concept visible. Art is fresh. The selected paintings by Escher and Magritte helped students better understand a non-functionalist approach to systems thinking, i.e. seeing the system with the environment by emphasising the boundary as a forming force, thinking in patterns rather than in isolated elements and understanding interactions. For the students it became clear that systems thinking was more a way of looking instead of a tool to solve complex problems. We emphasised a different approach of systems thinking, i.e. going beyond a focus on problems and orientation towards goals. The paintings added to the self-reflection of the students to think in a different way about the system/environment relationship. This corresponds with one of the leverage points of Freeman et al. (2015), i.e. connection to self.

The fact that it is rarely being used in HEIs for its pedagogical strength, may make students responsive to art. This fits with Lineberry and Wiek's (2016: 311) analysis that "art occupies a different intellectual, creative, and social space that can allow for surprising and promising perspectives and outcomes, offering innovative approaches to address sustainability problems." The case also showed that the students were able to make new connections and to use their analytical skills, as well as their creative and emotional skills, which is in line with Ivanaj et al. (2014) and Shrivastava (2010).

Apart from only fostering the understanding of different components of systems thinking, the paintings opened their mind-set and gave rise to alternative perspectives. In this way, visual literacy was developed and critical reflection was triggered (Palmer, 2015). In particular, the painting by Magritte evoked a diversity of feelings, which brings us close to a holistic approach towards systems thinking. Not only the head is triggered, but also the heart (Ivanaj et al., 2014).

Despite the responsiveness of the majority of the students to the paintings, there are always a few hardliners who oppose. Their resistance can be linked to the alternative approach that is used. Art-based approaches are not often used in management education and therefore prove difficult to accept in a relatively new environment. Students with a closed mind will not be able to make a connection with art. Thinking that they are not creative enough, is also a hindrance to the widespread use of this approach. This reaction is normal because art has the capacity to dig into questions of values and beliefs (Freeman et al., 2015) and asks us to be vulnerable to ourselves and others, a characteristic that students do not easily want to show. Therefore it is important, according to Freeman et al. (2015), to create a safe environment for students. Giving examples of organisations that have a solid link with art, like the art-based companies Illy Café and Brunello Cucinelli, (as described by Zsolnai and Wilson, 2016) might help. Integrating ethics and aesthetics is the cornerstone of their corporate culture and decision-making, and it shows that sustainable management and art can be integrated.

In the exploratory study used in this paper, we only utilised one type of arts-based process, i.e. 'illustration of essence' (see Taylor and Ladkin, 2009). We did not go as far as giving the students the opportunity to make art, despite the positive reflections on this topic by Taylor and Ladkin (2009) and by Ivanaj et al. (2014). It would have been possible to ask students to create an artwork answering the question: 'what would help you to see yourself as a system with the environment, while trying to create a provisional whole?' However, due to the very functionalist approach often applied in management education, this would have been very difficult for the students to accept. Moreover, it could also have a negative impact on the position of the lecturer. Not every lecturer has the qualities for coaching such a workshop, which is a necessary ingredient of success in facilitating such an activity (Taylor and Ladkin, 2009). Facilitators should have sufficient experience and understanding of art and of sustainability to be able to engage in this type of in-class activity. And if that is not the case, they could rely on professionals, as Freeman et al. (2015) are recommending. The students were also suggesting that artists might be invited to class. A visit to a museum during class time, combined with a group discussion on art and sustainability, could be another way of exposing them to art, or asking students to look for a piece of art and describe what it means for them in relation to sustainability.

Another limitation of the case used in this paper is the absence of the collective element. We did not give the students the opportunity to engage in group discussions; there was only space for individual reflection. Group discussions might have broadened or altered the view of certain students about the paintings. Some students gave the lecturer insight into their own interpretation of the art. Instead of illustrating the essence of the boundary in Magritte's painting, one student mainly saw a harassing act between two people and no link at all with systems thinking theory. This fits with Taylor and Ladkin's (2009) analysis that there is always a variety of interpretations of art. According to Bathurst and Edwards (2009: 23), "it is not our interpretation of the paintings that matter, it is the process of 'meaning-making interactions', the struggle to engage with and to interpret the image, and the emotional connectedness to that process". The painting by Magritte especially was fruitful for invoking diverse perspectives. Magritte's *Les Jours Gigantesques* evoked anger, mystery, being dissident, illusions, criticism of straight-line thinking, accepting the unknown, self-reflection. It is a mirror for dealing with sustainability, i.e. rethinking our behaviour in the sense of Naess's (1973) deep ecology. The students were interested in hearing our interpretations of the paintings and saw this as a prerequisite to be able to link the theory to the paintings. An additional strength of using art was also that of engaging the heart in the learning experience, so that head and heart were both involved in sustainability (Ivanaj et al., 2014). Some students were not ready to see themselves as a complex, living system, open for action and reflection in cooperation with their peers.

In the survey, it was specifically asked whether the students perceived art as a relevant way of explaining different ideas about the system/environment relationship, in order to improve their understanding of the interactions between system and environment. However, it remains difficult to actually measure whether art helps in fostering the systems thinking competency. As Zsolnai and Wilson (2016) stressed earlier, the intention of such studies is not to unravel a causal relationship between art and learning about (components of) sustainable development. Moreover, systems thinking is so complex that only a few aspects can be explained by the means of paintings.

5. Conclusion

Due to the complexity of the concept of sustainable development and its various interpretations and approaches, it remains challenging to convey the topic to students in higher education

settings. This paper focused on alternative ways of acquiring the systems thinking competency, one of the key competencies of education for sustainable development. In line with Shrivastava's (2010) pedagogy of passion, the power of using art as a way to foster systems thinking was explored in a management education setting.

While management education is known for its functionalist approach, the findings of this exploratory study indicated that business students are receptive to this type of alternative learning method. It was shown that using paintings as a way of stimulating visual literacy can be a relevant method for explaining CSR topics, helping students to understand different approaches of the system/environment relationship, encouraging critical thinking and adopting a holistic approach involving head and heart. Art can help students to engage in a reflexive process, which allows them to think critically about the sustainability concept addressed in class, and shows them that there is space for different approaches and interpretations of complex concepts to occur simultaneously.

While this paper was aimed at exploring the topic of the use of art to learn about systems thinking and to create space for a holistic approach, it is clear that further research is necessary. A follow up survey could be undertaken after a year to research whether the systems thinking competency was used in their new working environment and how the students had benefited from using art to foster this competency. The same research could be pursued with different types of art, such as street art, music or dance. The effect of art creation in groups could be researched in the context of group discussions, addressing other sustainability concepts, or actively making art in or outside the class in cooperation with other actors. However, it is our hope that, through tackling this topic and showcasing the use of art in a management education setting, similar activities may be undertaken within management education and beyond, thereby allowing more research on the topic in the future.

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