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Empowering Student Leadership for Sustainability in Higher Education: Looking Internally to Find Ways to Foster Change Agents

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Abstract

Many higher education institutions struggle to find meaningful ways to include students in the journey of integrating sustainability and fostering student leadership for sustainable development. The Three Levels of Sustainability framework (Cavagnaro and Curiel, 2012) emphasizes the need for taking responsibility and accepting the role of a change agent for sustainability. Students may be apt and willing to take on the role of change agent for sustainability, but peripheral roles, disregard for their "lay" knowledge, and lack of space to take responsibility can inhibit their engagement in SD in higher education. Higher education institutions need to engage student populations from the beginning of their higher education career by informing them of the higher education perspective, respecting and meaningfully incorporating their insights through engagement interfaces, incorporating sustainable development early enough in their curricula—by means of student-activating learning, and by creating space for students to take on responsibilities for sustainability within the context of the HEI and beyond. The learning potential of volunteerism and active, out-of-class activities needs to be further explored and exploited by higher education institutions. Modern day student perceptions of sustainability are sophisticated, and require a holistic approach that recognizes the complex interactions of the three pillars of sustainability. In this paper, the collaboration between a Belgian higher education institution and a European student network is explored in an attempt to extrapolate concrete actions that allow higher education to actively engage students for sustainability.

Keywords: student engagement, leadership for sustainable development, informal learning methods, lay-expert knowledge divide

1. INTRODUCTION

The integration of sustainable development (SD) has become a relevant topic in higher education, and increasingly, higher education institutions (HEIs) are attempting to take responsibility as agents in promoting SD principles (Lukman and Glavič, 2006). Although many charters and declarations have provided guidance for integrating sustainability in the higher education sector throughout the last decades (Lozano, Lukman, Lozano, Huisingsh, and Lambrechts, 2011; Wright, 2002, 2004), actual implementation of the proposed actions and initiatives towards SD integration in higher education is often still lacking. HEIs can contribute significantly to fostering the transition towards a sustainable society due to their double role: (1) creating knowledge and transferring this knowledge to the society, and (2) preparing students for their future role in society. Sustainability initiatives carried out by HEIs are traditionally classified into activities within education, research, outreach, and the everyday operations of these institutions (Cortese, 1997; Lidgren, Rodhe, & Huisingsh, 2006; Velazquez, Munguia, Platt, & Taddei, 2006). Although activities within the field of education are targeted at students, this classification generally does not stress the role students play in the process of SD integration in HEIs, or how pivotal students are when seeking to change of mindset within these institutions, and consequently, within our society. This paper stresses the students' role when integrating sustainable development in higher education, and aims to motivate, empower, and foster student leadership for SD.

The interaction between the Hogeschool-Universiteit Brussel (HUB), Students' European Network for Sustainable Development (SENSD), and the European Commission, within the framework of the European Development Days, will serve as a case study to examine how HEIs can engage in SD activities with students and other societal players, in order to foster student leadership and actively prepare students for their future lives and careers and the SD challenges they will be confronted with within. The SENSD student organizers, event participants, and survey respondents represent a student population that already values the themes of SD and is engaged in the topic on some level. By targeting these students, this paper strives to specifically deal with the student population that is of high likelihood to be change agents for SD, and further examine what HEIs can do to foster their leadership.

Firstly, this article will examine how leadership for SD can be fostered among the student population; secondly, a case highlighting the collaboration between a HEI in Belgium and a European student network for SD will be presented; lastly, the article will conclude with a discussion on topics raised throughout this paper and recommendations for HEIs that wish to further foster student leaders for SD.

2. THE STUDENT PERSPECTIVE

The transition process towards sustainable higher education is often described in terms of policy development, curriculum reform, research and outreach activities, implementation models, integration strategies, evaluation instruments, and indicators. However, it seems that the students' perspective in these initiatives is often overlooked. This section aims to clarify the role of students in the SD integration process in a HEI, looking at the concepts of the engagement interface and personal leadership for SD.

2.1 SEEKING THE HOLY GRAIL: STUDENT ENGAGEMENT

SD integration in higher education is not often addressed from a student perspective. Both Nejati and Nejati (2012) and Yuan and Zuo (2012) explicitly appoint students as one of the key stakeholder groups of HEIs, and focus their research on this important group. Nejati and Nejati's (2012) research discusses the design of a measurement scale from the perspective of students to evaluate SD

practices of HEIs, with the aim of using it as an instrument for institutional administrators and policy makers. Yuan and Zuo (2012) quantitatively investigate students' perspectives on campus sustainability in a university setting in China, and conclude that there is a considerable level of awareness of SD issues within the surveyed student community. The research points out that, in general, environmental aspects of SD were perceived as being of higher priority than social SD aspects (Yuan and Zuo, 2012).

Student conceptions, perceptions, and attitudes towards SD issues have been the topic of previous research (e.g., Barth and Timm, 2011; Emanuel and Adams, 2011; Kagawa, 2007; Ng and Burke, 2010; Taylor, Carew, and Mitchell, 2010), but nevertheless, this type of research has mainly led to the specification of certain dissonances between certain groups of students, instead of actively finding ways to influence student conceptions, perceptions, and attitudes. For example, Emanuel and Adams (2011) discover a "commitment gap"—a gap between the commitment of students living in communities that actively engage with SD and the students that live in communities where there is less active engagement for SD, and they assume that engagement for SD is passed through via the community to the school environment. Ng and Burke (2010) focus their research on student attitudes towards sustainable business practices, and they suggest that psychosocial characteristics of individuals—like values, cultural orientation, and leadership styles—are more predictive of these attitudes than demographic variables. Although these results provide valuable information, there is need to move towards more concrete action-finding ways to actively engage students, rather than theorizing about possible reasons for their (lack of) commitment to SD.

An alarming occurrence in research on the student side of SD integration in HEI is the non-holistic view of sustainability and sustainable development. Yuan and Zuo (2012) consciously left economic considerations out of their research with the justification that, "The economic dimension is not covered in this study due to the fact all public universities in China are non-for-profit." The resulting scale of Nejati and Nejati (2012), intended to for use as a reliable measurement scale, from the perspective of students, to evaluate sustainability practices of universities, includes the following four themes: community outreach, sustainability commitment and monitoring, waste and energy, and land use and planning—nowhere is economic consideration explicitly included. Emanuel and Adams, 2011 define sustainability as an, "economic, social, and economical concept," however, they also state that sustainability encompasses, "renewable energy sources, conservation, recycling, environmentally friendly land development, water management, and waste disposal," without making explicit reference to social or economic considerations. The authors do go on to define *campus* sustainability as ecological, economic/financial, institutional, and energetic considerations—including economic considerations, but not societal. This is carried over to their research methodology—when seeking to measure respondents' commitment to sustainability, Emanuel and Adams (2011) ask questions such as whether students recycle, use environmentally-friendly products, and/or have energy-efficient transportation. Although it is difficult to define commitment to sustainability, one could argue whether simple commerce of products with environmental claims signifies one's commitment to meet the needs of the present generation without compromising the ability of future generations to meet their needs. Newport, Chesnes, and Lindner (2003) already call on HEIs to avoid ecocentric approaches to sustainability. The RIO+20 United Nations Conference on Sustainable Development, held in Rio de Janeiro 2012, illustrates a global trend away from ecocentricity—approaching SD in a holistic manner with regards to economic, social, and environmental concerns and the interaction/interdependency of those three—focusing on a (1) green economy in the context of sustainable development and poverty eradication, and (2) the need for an institutional framework for sustainable development.

2.2 FOSTERING ENGAGEMENT

Competencies for SD require new approaches in teaching and learning (Tilbury and Mulà, 2011), and a reorientation of education towards more multi-, inter-, and transdisciplinarity, self-regulated learning, project- and problem-based learning (Lambrechts et al., 2008). This transition is characterized by: (1) interactive and participative methods, (2) action-oriented methods, and (3) research based method (Lambrechts et al., 2012). Student-activating teaching methods are particularly interesting for this, because they require the students to participate actively, think critically, and reflect (Hoogeveen and Winkels, 1996). Theories have been developed on what the actual competences for SD are that students should acquire throughout their HEI career (Barth, Godemann, Rieckmann, and Stoltenberg, 2007; De Haan, 2010; Rieckmann, 2012; Wiek, Withycombe, and Redman, 2011). Lambrechts et al. (2012) compare a list of necessary competences for SD with actual integration in Belgian higher education curricula. The authors conclude that mainly the SD competences related to system thinking, future thinking, personal commitment, and action taking are virtually absent in many study programs of HEIs (Lambrechts et al., 2012). An active approach towards student perspectives and engagements implies going a step further—besides just theorizing, working towards concretely translating these findings into actions within the higher education system. This can be done (among various ways) by addressing particular pedagogies that are suitable for transferring insights on SD to the students in order to actively engage them and offer them the necessary skills to address complex SD issues (e.g., ability to think critically, future-oriented thinking, or work in interdisciplinary teams). Student-activating teaching methods are particularly interesting for this, because they require the students to participate actively, think critically, and reflect (Hoogeveen and Winkels, 1996).

Active engagement of students can also be achieved by organizing extra-curricular outreach activities on the topic of SD, like the event presented in this paper. Moore (2005) identified the need for space within the university setting for reflection and pedagogical transformation where participatory group learning and transformative learning can occur. These spaces could allow for the transformation of individuals, classrooms, and learning communities (Moore, 2005). The engagement interface (Fear and Sandmann, 2001), a space created for academics and citizens to engage together, is essential for re-engaging HEIs with the societies they serve. In this sense, the transfer of knowledge about sustainable development is a two-way, socially-constructed learning. Bawden (2004) notes that challenges with such two-way interfaces: the lay-expert knowledge divide includes issues like legitimacy issues regarding “lay” knowledge (Bawden, 2004). Using a bottom-up approach, where students can contribute to shaping an SD activity, creates actual involvement, helps raise awareness among the student community for sustainability (Yuan & Zuo, 2012), and prepares students to take on leadership roles for SD in their future life and careers. In addition, this approach brings together different university stakeholders (e.g., lecturers, students, government executives, and business managers) to discuss about SD, which is crucial for attempting to achieve a collective force to tackle sustainability transformation (Nejati & Nejati, 2012). Moreover, for the HEI, the activation of students and other stakeholders for SD also has the advantage that inputs provided by these actors can be used as feedback for achieving the sustainability goals of the institution.

2.3. FOSTERING LEADERSHIP FOR SD

Within the general debate of transition towards sustainability, the main focus is on organizational and societal change, hence, marginalizing the role and responsibilities on the individual level (Cavagnaro and Curiel, 2012). Nevertheless, this individual level cannot be underestimated, as organizational and societal change will only occur when the people behind it take responsibility for the transition process. For this purpose, Cavagnaro and Curiel (2012) link the personal leadership for sustainability to sustainable organization and sustainable society in the Three Levels of Sustainability (TLS) framework. This framework builds on the notions of “care” and is, therefore, prequalifying the

responsibilities at each level. The term “leadership” is not interpreted as a formal function or mandate in a given organization or firm, but is built on the notion of taking responsibility and accepting the role of a change agent for sustainability within your own position in a given organization or in society.

Given the diversity of definitions and interpretations of “leadership”, it is difficult to clearly focus on this notion. Cavagnaro and Curiel (2012) state that the concept of “authentic leadership” is most appropriate to clarify the role of the individual within their TLS framework, citing the definition of Luthans and Avolio (2003:243, in Cavagnaro and Curiel, 2012), *“a process that draws from both positive psychological capacities and a highly developed organizational context, which results in both greater self-awareness and self-regulated positive behaviours on the part of leaders and associates, fostering positive self-development”*.

The TLS framework and the notion of personal leadership for sustainability described by Cavagnaro and Curiel (2012) are particularly interesting to use when clarifying the role of students within the transition towards sustainable higher education. As students can present challenges as a target group to engage—typically leaving the institution within 3-6 years, to be replaced by their predeceasing class—this framework clearly sets the focus and frames what could be their particular role within the university as an organization. In other words, if they see and understand their particular role and responsibilities, students can be leaders for sustainability within higher education and, after graduation, continue to be change agents for sustainability in their professional life. In order to prepare students for their future roles as leaders for sustainability, HEIs should fulfill their role as sustainable organizations and provide spaces for individuals (students) to become sustainable change agents within society.

3. CASE DESCRIPTION: COLLABORATION BETWEEN THE HOGESCHOOL-UNIVERSITEIT BRUSSEL (HUB) AND THE STUDENTS’ EUROPEAN NETWORK FOR SUSTAINABLE DEVELOPMENT (SENSD)

In the following section, the collaboration between HUB, a Belgian HEI, and SENSD, a European student network will be explored. The culmination of the collaboration—an event held in October 2012, entitled Building Future Curricula: Sustainability in Higher Education—will be discussed in detail to provide a case where collaboration between a HEI and student organization fostered student leadership for SD. The section concludes by presenting the follow-up survey to the event, wherein further insight on the perspectives of students regarding occupational themes of sustainability and competencies for education for sustainable development are further explored.

3.1 HUB AND SENSD

The HUB is a higher education institution located in Brussels, Belgium. More than 7000 students, of which more than 10% are international students, study at the HUB in Dutch and English programs. These students are supported by +/-1000 staff members. HUB has had a long commitment to sustainability, and was proud to be the first Belgian HEI to publish a GRI sustainability report in 2011. The Students’ European Network for Sustainable Development is a fast-growing network aimed at gathering students to promote sustainable development by exchanging knowledge and information. The network is solely led by students all over Europe and builds a forum for several student associations as well as individual students in Europe. SENSD contributes to the improvement of communication and cohesion among European students on issues of sustainable development and aims to give students’ voices greater importance by getting engaged in numerous projects and conferences.

In 2011, students interested in starting a local Belgian chapter of SENSD first approached the HUB. In academic year 2011-2012, the HUB first collaborated with SENSD by allocating part of a Local Agenda

21 grant to the SENSD group for an event the SENSD students wished to organize during the HUB Week of Sustainable Food. The HUB supported the SENSD students in the planning and logistical aspects of the event. After the success of their initial event, HUB encouraged SENSD to apply for their own Local Agenda 21 funding.

3.2 A SIDE EVENT TO THE EUROPEAN COMMISSIONS' EUROPEAN DEVELOPMENT DAYS: "BUILDING FUTURE CURRICULA: SUSTAINABILITY IN HIGHER EDUCATION"

The European Development Days (EDD), organized by the European Commission, is an annual forum on international affairs and development cooperation. The EDD is described by the Commission as a unique, collaborative forum, with a global reach to springboard and reflect on ideas and interventions and highlight the role of the European Union (EU). The EDD is a closed event; participants are mainly government delegates and members of stakeholder organizations. Organizations are allowed to submit proposals to organize high-level panels within the main forum and as side events located outside the EDD venue.

In May, 2012, the SENSD Belgium group approached the HUB with interest in co-organizing an official side event to the EDD, hosted by the HUB, and open to all students whom wish participate. The European Commission, the Katholieke Universiteit Leuven, VLIR-UOS (the Flemish inter-university board for development cooperation), the City of Brussels Local Agenda 21, and Ecocampus (a division of the Flemish governments' environmental agency for implementing sustainability in higher education) collaborated with the HUB and SENSD on the project.

The purpose of the event was to create a space for European higher education students to participate in the EDD. The SENSD students felt it was important to have the voice of students heard, and the European Commission was interested in supporting such a space as an official side event to the EDD. The HUB could offer a physical space and organizational resources to support the SENSD student organizers. The intention of the event was to be a "by the student, for the student" space for dialogue and strategizing on SD within the HE context and beyond. Participation in the event was not limited to students—academic representatives, government representatives, and employers were all invited to participate, thus creating a unique space, embodying the theory of the engagement interface (Fear and Sandmann, 2001). The event was given the name "Building Future Curricula: Sustainability in Higher Education" because the main purpose of the event was to reflect on the current state of SD integration in HEIs, the needs of students from their HE experience in terms of readiness for SD application after HE, and how HEIs approach to SD can be improved to better reflect the needs of students.

The HUB and SENSD met and communicated via e-mail frequently leading up to the event. Organizers from the HUB and SENSD student organizers went together to meetings with the European Commission and Ecocampus.

The Building Future Curricula event was organized as follows:

- Debate Cafes – organized by Ecocampus, aimed to stimulate a discussion on various topics of sustainable development in an informal setting during the weeks leading up to the high-level panel;
- Keynote Presentation – by Ms. Jyoti Gopinathan (South Asia Environmental Network) and Professor Francisco Lozano-Garcia (academic expert in implementing sustainability in higher education, Tecnológico de Monterrey, Mexico) provided participants a general introduction to SD implementation in HEIs;
- High-Level Panel – with representatives from students organizations from the North (Europe – UK) and South (South Asia – India), academics from the (Belgium and Mexico), Policy level (Regional Centre of Expertise representative), and professional field (representative from a

major labor organization in Belgium). Content of this discussion was determined by the SENSD students, and focused on three central questions:

1. How can SD be better integrated in higher education?
 2. Is a simple integration of SD practices into the current academic content sufficient, or is there a need to re-structure academic programs to create a new sustainable vision?
 3. How can the private sector and educational institutions work closer together to assess labor market needs and to adapt to these needs in time?
- Student-Led Interactive Workshop – using Open Space Technology (OST), students worked in small groups to identify the topics relevant to them and propose action steps.
 - Follow-up survey – after the event, a follow-up survey was conducted in order to gather further information about the students’ perspective on the topic.

The debate cafes and keynote presentation provided student participants an introduction to sustainability in higher education. The high-level panel gave students a deeper perspective of “sustainability” through the lens of academia, the government, and the private sector. Students were able to ask questions to experts in an intimate setting. The student-led workshop was the closing event, and it provided a space for open discussion.

Although participation in all of the events was free of charge, there was no funding to cover student travel or lodging costs. SENSD was sensitive to the fact that this would be a limiting factor for students who wished to participate and, therefore, took steps to make the event assessable to all European students via remote participation.

Live Streaming

All high-level panels in the official venue of the EDD are live streamed, and at the request of the European Commission, the Building Future Curricula event was also live streamed. The initial idea of the SENSD student organizers was that SENSD groups from across Europe could organize for viewing parties and contribute via Twitter to the discussion. Although this was a very interesting idea, it proved to be too ambitious for the students to organize in the limited time. The video recording of the event is available on the SENSD website (www.sensd.org).

Survey

As a follow up to the event, HUB and SENSD Belgium developed a survey that aims at gaining a deeper understanding of students’ perspectives regarding the three main themes of the Building Future Curricula event: 1) how can SD be better integrated in higher education; 2) is a simple integration of SD practices into the current academic content sufficient, or is there a need to re-structure academic programs to create a new sustainable vision; and 3) how can the private sector and educational institutions work closer together to assess labor market needs and to adapt to these needs in time? Following up on these main themes, the HUB-SENSD survey aimed to answer the following questions: 1) which occupational themes of SD do students foresee being most important in their future careers; 2) which competencies for SD do students foresee being important in their future careers; 3) where, in and out of formal HE curricula, do students gain the knowledge and skills necessary for SD competencies. The results of the survey will be discussed in section 4.3.

4. RESULTS AND OUTCOMES

Both SENSD and HUB experienced this initiative to be highly valuable as a learning process (see Figure 1). For HUB, the practical organization of the event provided firsthand experience collaborating with student organizers and created space in the SD integration process of HUB for

student leadership. HUB helped the SENSD students develop the project program, secure funding, prepare logistics, and publicize the event. For most of the SENSD student organizers, it was their first time writing grant proposals, organizing a large event, and having exposure to the working culture of public institution. The SENSD students were able to learn firsthand about the challenges of organizing such events, with the continued support of HUB to help students' overcome challenges as they arose. The outcomes of the OST workshop and follow-up survey also provide valuable insight into students' perspectives on the topic.

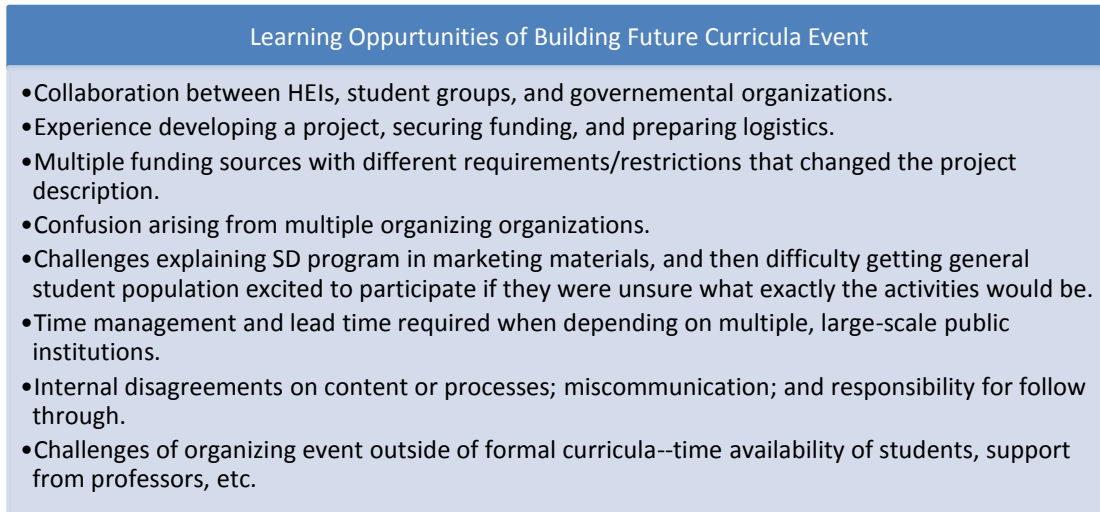


Figure 1: Learning Outcomes of Building Future Curricula

4.1 EXPERIENCES IN ORGANIZING THE EVENT

As SENSD Belgium was only formed a year prior to the event, this was a massively larger project than SENSD Belgium had ever organized, but it was also the largest project SENSD Europe has ever organized. The fragmented nature of the SENSD network, in terms of multiple operating branches in different countries, made coordination difficult. Students' time is also very constrained by their academic commitments, and the sheer amount of time required of student organizers for a project for this scale was at times daunting. The practicalities of budget, time, and resources and the differing visions amongst the SENSD student organizers required quite a bit of compromise. It is clear from the topics chosen by the SENSD organizers for the high-level panel that the economic pillar of SD is important for students. The SENSD organizers repeatedly stated their desire to address topics of employability and green growth. As the majority of them will enter a job market distinguished by the recession, they do not have the luxury to dismiss this pillar. This mentality is mirrored by the global trend away from ecocentric approaches to sustainability towards green growth.

4.2 OUTCOMES OF THE OPEN SPACE TECHNOLOGY

The student-led workshop used OST to foster student ownership of the space. A student trained in OST gave an initial explanation of the concept to the group, and then lightly facilitated time management. Participants who were motivated to propose discussion ideas were able to freely identify the topics they wished to discuss and post them on a board organized by three timeslots. In each time slot, participants looked at the board of topics and were free to choose which discussion group they wished to join in that timeframe. The participant who had proposed the topic gave an initial introduction to their discussion group and took notes for the group. Participants were free to move from discussion to discussion as they pleased, and everyone regrouped at the end of each

timeslot. The entire workshop ended with a circle discussion where participants identified next steps for after the event.

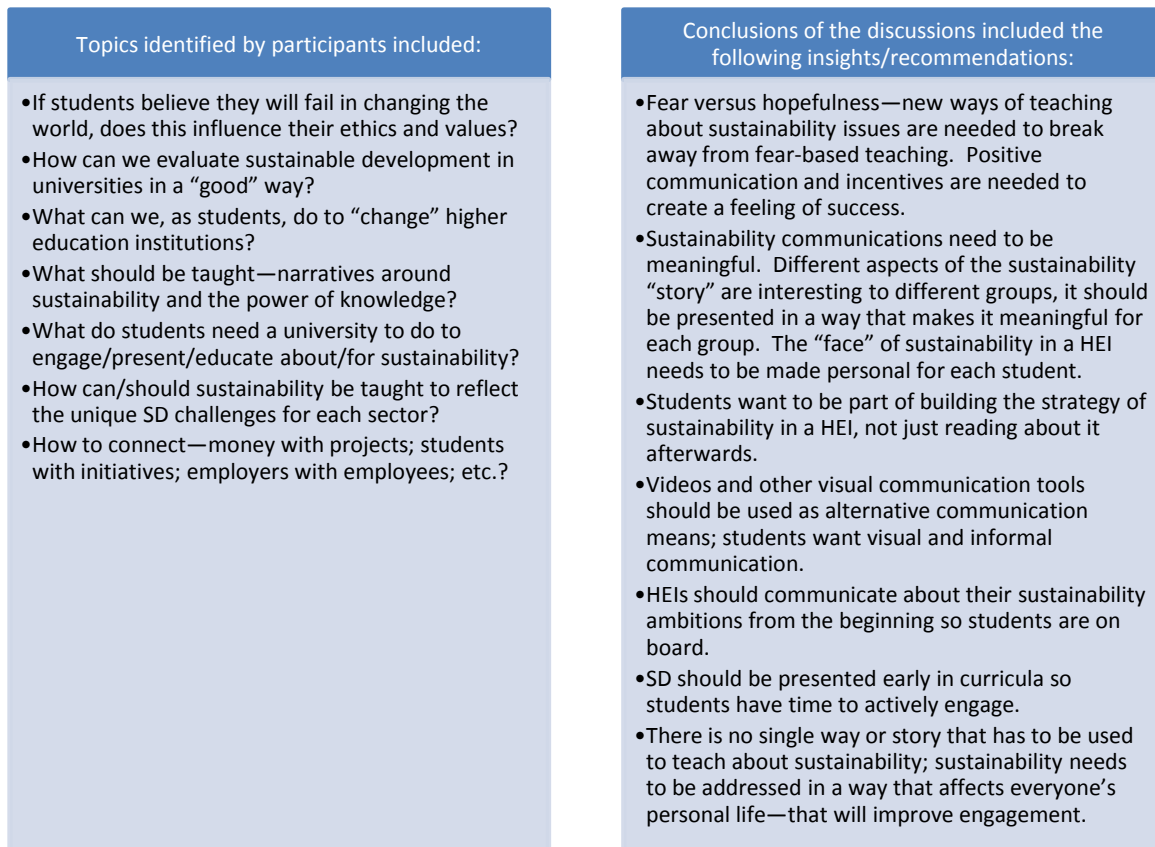


Figure 2: Outcomes of Student-Led OST Workshop

Some of the major outcomes of the OST workshop are presented in Figure 2. The atmosphere of the workshop was hopeful and motivating to student and non-student participants alike. Some student participants expressed that the event was the first platform that they had encountered where they could express their ideas and exchange in dialogue with representatives from academia, government, and the private sector about SD themes. Academic experts expressed that they were motivated by the students’ energy and sense of urgency to address the topics of SD. Both sides were able to hear the visions, limitations, and perspectives of the other.

4.3 RESULTS OF THE FOLLOW UP SURVEY

The topics of the Global Reporting Initiative (GRI), a widely accepted framework for sustainability reporting, were used to identify occupational topics of sustainable development (see Appendix 1). Participants were asked to predict relevance of each topic for their future career. Secondly, participants were presented accepted Rieckmann’s (2011, 2012) competencies for education for sustainable development. Participants were asked to assess on a five-point scale to what extent they feel they have mastered competencies for SD, where outside formal HE curricula they gained knowledge and skills for SD competencies, and where within formal HE curricula they feel they could be further gain knowledge and skills necessary for SD competencies. Competencies are often presented in literature as panacea for education for sustainable development, but little remains about how and where these competencies can be achieved.

Participation in the event as well as the follow-up survey was aimed at European students of higher education, or foreign students studying in a European HEI, who are already actively engaged in SD (via membership in the SENSD network or similar organizations). The survey was made available to students in the SENSD online social network (www.send.org) as well as to participants of the Building Future Curricula event via e-mail. Participation in the survey was completely voluntary. Students could choose which sections of the survey to participate in. 56 students participated in the survey out of +/-200 students that were invited. Of the participants, 46% are male and 54% are female; 52% are in their bachelor studies, 41% are in master studies, 3.5% are postgraduate, and 3.5% are other. Some identified nationalities of participants include: Belgian, Dutch, French, German, Italian, Polish, Romanian, Lithuanian, Latvian, Greek, Swiss, Russian, Moldovan, Serbian, Turkish, Ukrainian, and from the UK. Students identified a broad spectrum of study programs they were enrolled in, including: business and management studies, social studies, psychology, earth sciences, performing arts, political studies, and law. As illustrated in Figure 3, the majority of participants were studying professional and applied sciences (50%), followed by social sciences (27%), natural sciences (14%), and humanities (9%).

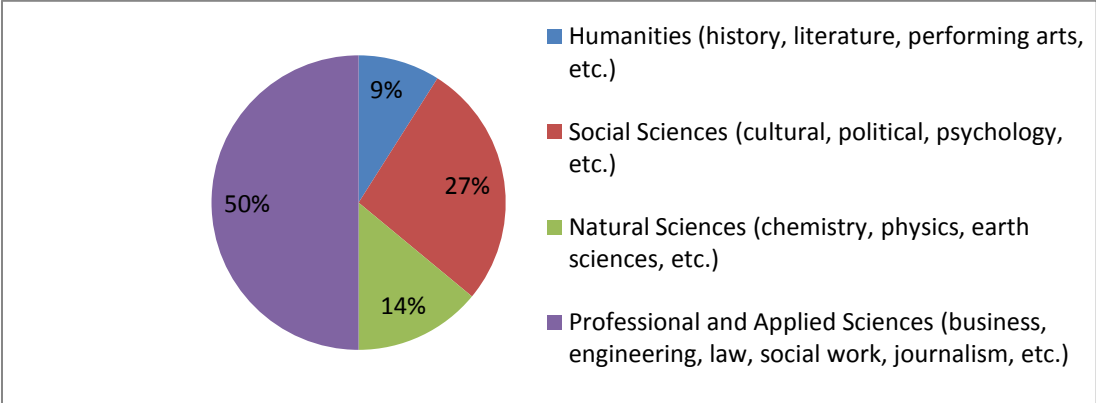


Figure 3: Participants Area of Study

Participants indicated that their desired future sector for employment would be primarily the private sector (34% in quaternary; 19% in tertiary; 10% in quinary; followed the civil/social sector (10% participatory NGOs; 6% service NGOs; and 4% empowering NGOs); and the public sector (15% public administration; 3% executive) (see Figure 4). When asked what their main drivers for their future career paths, students identified: personal interest (57.50/100), benefit to society (34.17/100), and salary (25.10/100) as the top three drivers (see Figure 5).

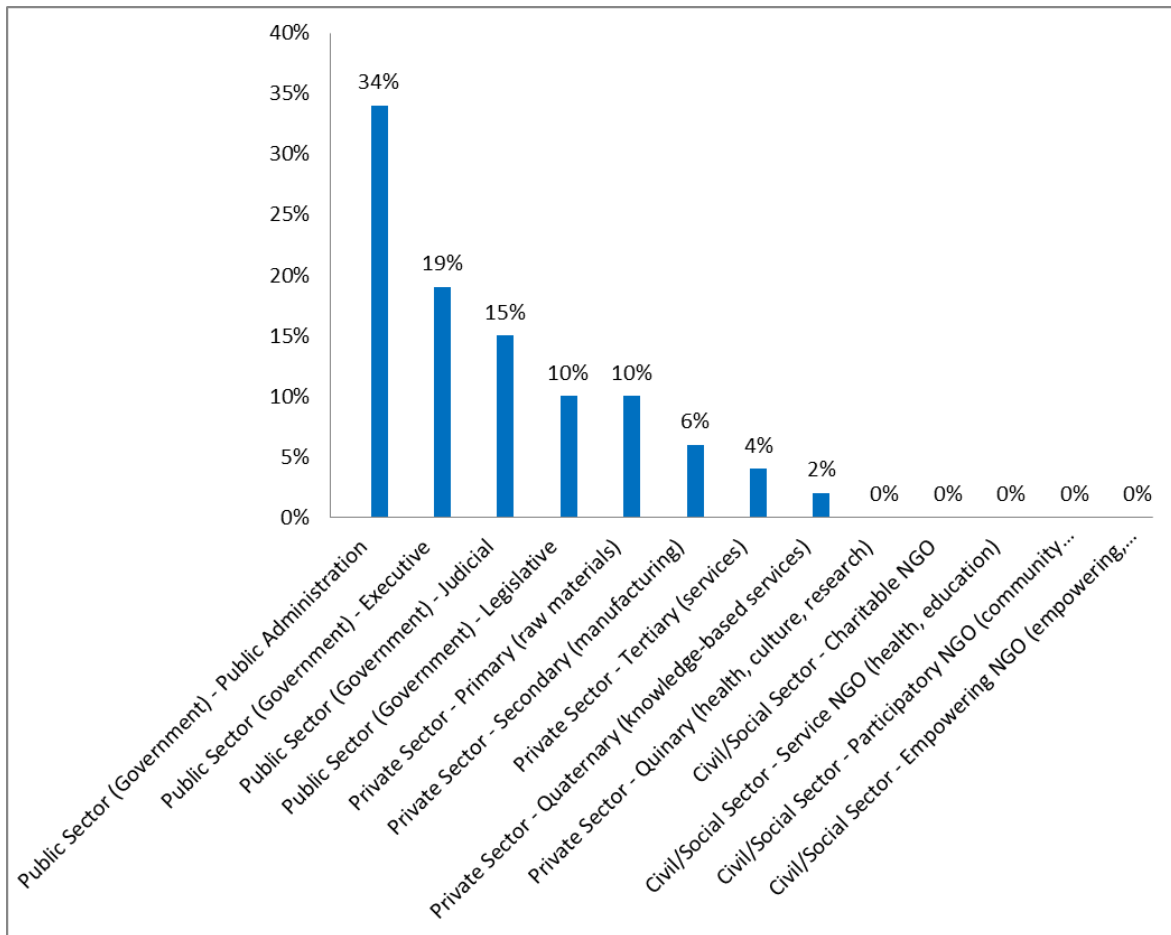


Figure 4: Desired Future Sector of Participants

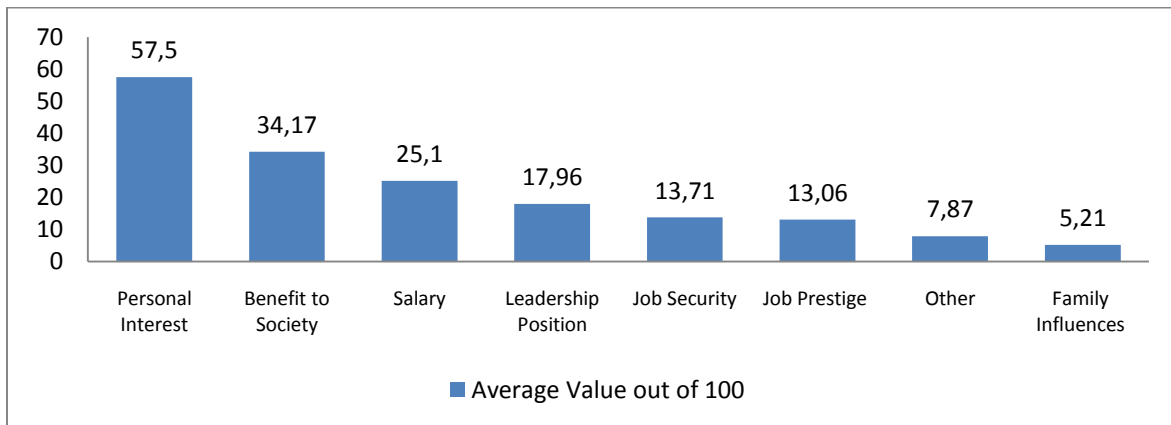


Figure 5: Reasons for Future Employment Sector

Student Perspectives on Occupational Themes of Sustainability

Students were asked to rank how relevant they believe occupational themes of sustainable development would be in their future career on a scale of 1 to 5 (5 being very relevant). The results are presented in Figure 6.

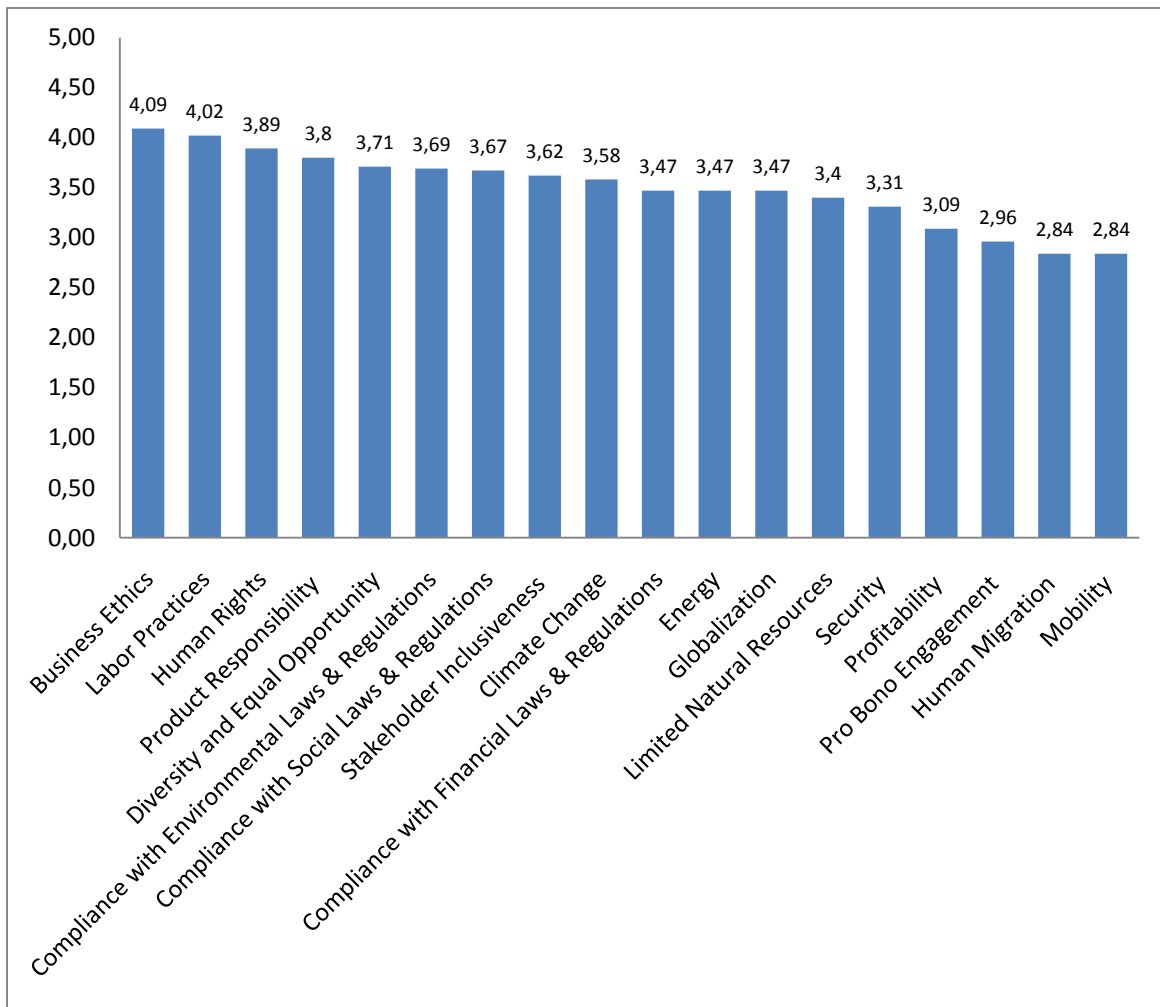


Figure 6: How Relevant Occupational Themes of Sustainability will be in Students Future Career

It is difficult to clearly divide occupational themes of sustainability into the three pillars of SD, but for the sake of this paper, we will loosely organize the themes into economic, environmental, and social in accordance with the GRI.

Economic themes in cascading order are as follows: business ethics (average value 4.09, StDev 1.24), compliance with financial law and regulations (average value 3.47, StDev 1.34), profitability (average value 3.09, StDev 1.56), globalization (average value 3.47, StDev 1.52), and pro bono engagement (average value 2.96, StDev 1.57).

Social themes in cascading order are as follows: labor practices (average value 4.02, StDev 1.14), human rights (average value 3.89, StDev 1.30), product responsibility (average value 3.80, StDev 1.24), diversity and equal opportunity (average value 3.71, StDev 1.32), compliance with social laws and regulations (average value 3.67, StDev 1.26), stakeholder inclusiveness (average value 3.62, StDev 1.37), security (average value 3.31, StDev 1.52), human migration (average value 2.84, StDev 1.43).

Environmental themes in cascading order are as follows: compliance with environmental laws and regulations (average value 3.69, StDev 1.46), climate change (average value 3.58, StDev 1.63), energy (average value 3.47, StDev 1.49), limited natural resources (average value 3.40, StDev 1.86), and mobility (average value 2.84, StDev 1.49).

As seen in Figure 6, “business ethics” was scored as the likely most relevant occupational theme of sustainability that respondents anticipate they will encounter in their future careers. Not only did this theme receive the highest average value of 4.09, there was the second lowest standard deviation of 1.24. In close second was “labor practices” with an average value of 4.02 and the lowest standard deviation of 1.14.

Competencies for Education for Sustainable Development

Relevance of Competencies

Within the survey, students were asked to rate the competences according to how important respondents feel each competency will be in their future career. The results of this question are illustrated in Figure 7 below and can be clustered in five groups of competencies:

Competences related to systemic thinking were rated as the most important (average value 4.49, StDev .60). Students see this as a key factor for solving SD issues.

A second cluster consists of competences related to critical thinking (average value 4.37, StDev .73), anticipatory thinking (average value 4.34, StDev .66) and empathy and change of perspective (average value 4.32, StDev .72). It is clear students are very well aware of the importance of future-orientated and anticipatory thinking for sustainability, and of the importance of being empathic and being able to change perspectives.

A third cluster contains competences related to cooperation (average value 4.27, StDev .87), interdisciplinary work (average value 4.27, StDev .78), participation (average value 4.15, StDev .73) and planning and realizing innovative projects (average value 4.15, StDev .88) could be seen as a third cluster of competences valued by the students. Students acknowledge the importance of cooperative and participatory competences.

A fourth cluster contains competences that put the emphasis more on attitudes and values: acting fairly and ecologically (average value 4.05, StDev .89) and ability to deal with ambiguity and frustration (average value 4.02, StDev .96).

A fifth cluster contains competences which students interpret to be less relevant in dealing with SD issues. They are related to communication and use of media (average value 3.90, StDev 1.14) and evaluation (average value 3.90, StDev .89).

Mastery of SD Competencies

Complementary to identifying the competencies that students feel are going to be the most relevant in their future, it is interesting to know how far along in their learning of these competencies students are.

Participants were asked, on a scale of 1-5 (5 being mastery), to identify where they were in their learning of each SD competency. Figure 8 below illustrates the results of how well participants feel they have mastered competencies for SD. Cooperation in groups (average value 3.98, StDev .87), as well as, empathy and change of perspective (average value 3.98, StDev .72) were given ranked as the highest level of mastery amongst respondents, followed by acting fairly and ecologically (average value 3.68, StDev .89), participation (average value 3.66, StDev .73), critical thinking (average value 3.61, StDev .73), systemic thinking (average value 3.59, StDev .6), interdisciplinary work (average value 3.59, StDev .78), anticipatory thinking (average value 3.54, StDev .66), communication and use of media (average value 3.39, StDev 1.14), planning and realizing innovative project (average value

3.32, SD .88), evaluation (average value 3.07, StDev.89), and ability to deal with ambiguity and frustration (average value 2.98, StDev .96).

With respect to the level of mastery students feel they already have for SD competencies, it is interesting to look further into where said competencies have been acquired. Participants were asked to identify where outside of formal HE curricula, they gained the knowledge and skills necessary for SD competencies. The results, as displayed in Figure 9, were very informative. Overwhelmingly, participants identified volunteering as the activity outside formal HE curricula where they acquired knowledge and skills necessary for SD competencies, with the only exceptions of: independent learning for communication and use of media; previous work experience for critical thinking; and both previous work experience and youth activities for evaluation. Interestingly, secondary education is not seen to have a relevant contribution to participants' acquisition of knowledge and skills for SD competencies.

When participants were asked where within formal HE curricula they feel they could improve their mastery of SD competencies by gaining the necessary knowledge and skills, participants gave the highest average value to active, out-of-class activities for every single competency. It is not surprising that, out-of-class activities—such as internships, volunteering, student groups, etc.—received the unanimously highest average value, when we consider that volunteerism was so critical to their acquisition of knowledge and skills for SD in the past.

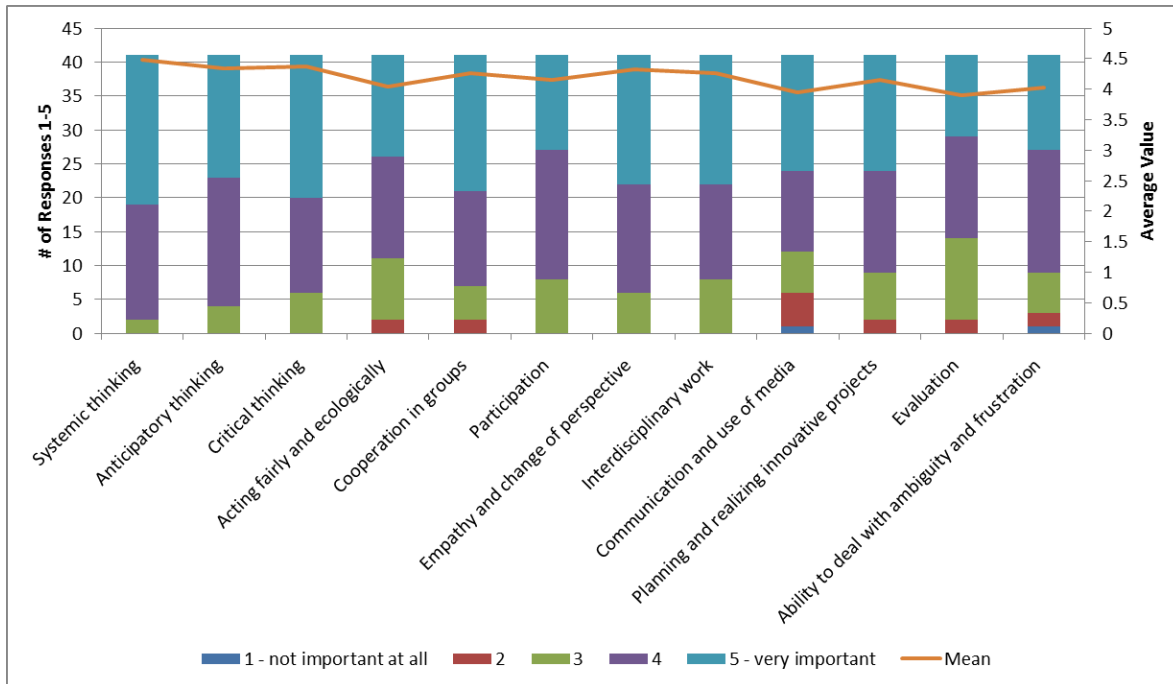


Figure 7: Relevance of Competencies for Education for Sustainable Development in Future Career

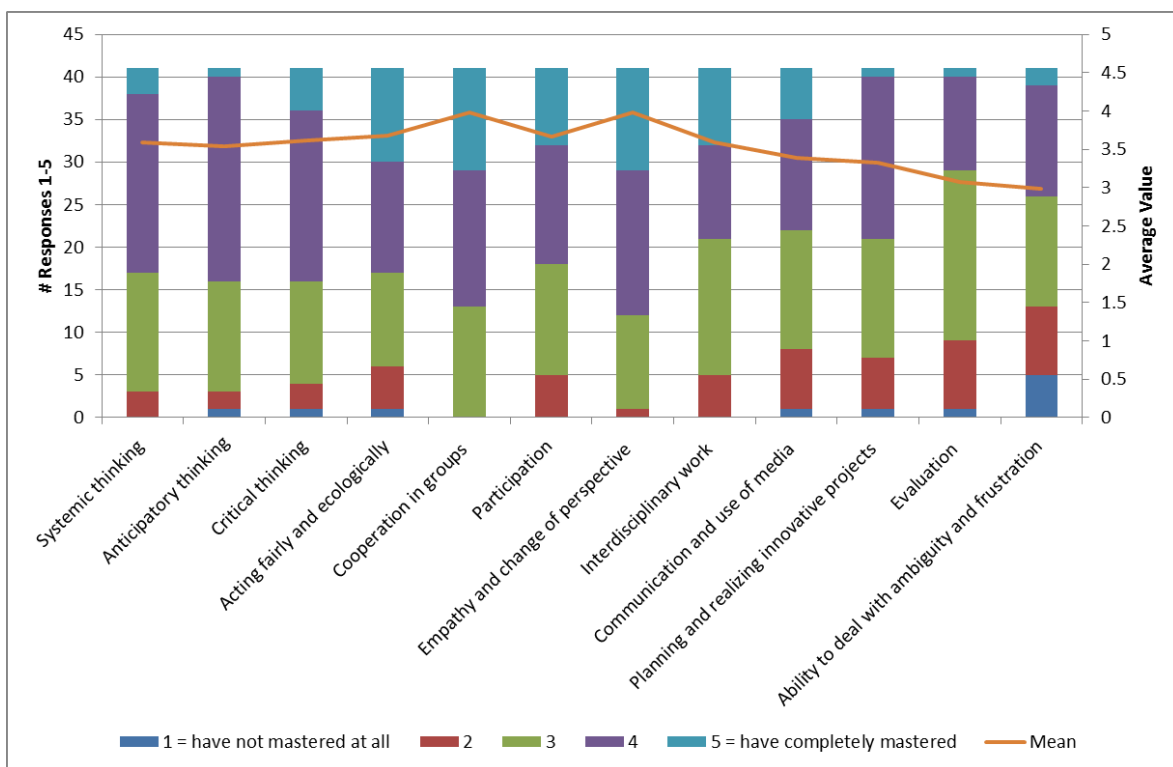


Figure 8: To What Extent Respondents Feel They Have Mastered SD Competencies

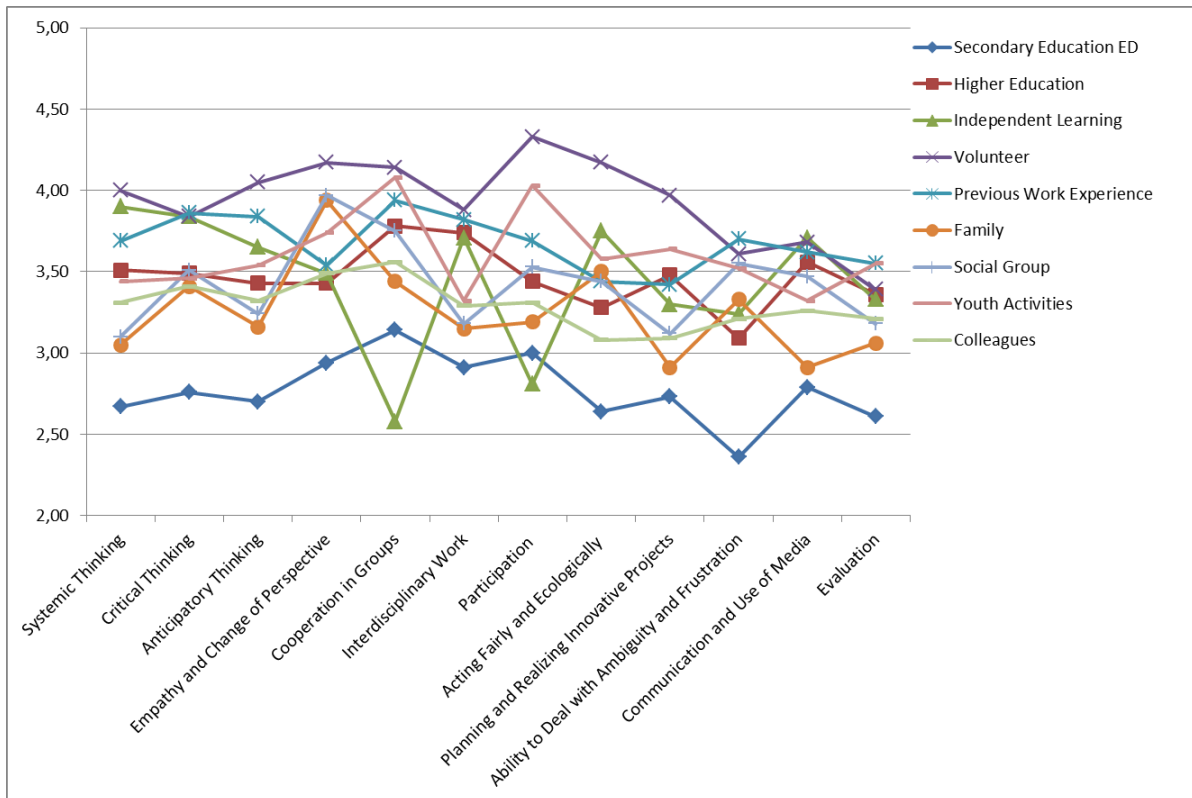


Figure 9: Where Outside Formal HE Curricula Respondents Feel They Have Gained Knowledge and Skills Necessary for SD Competencies

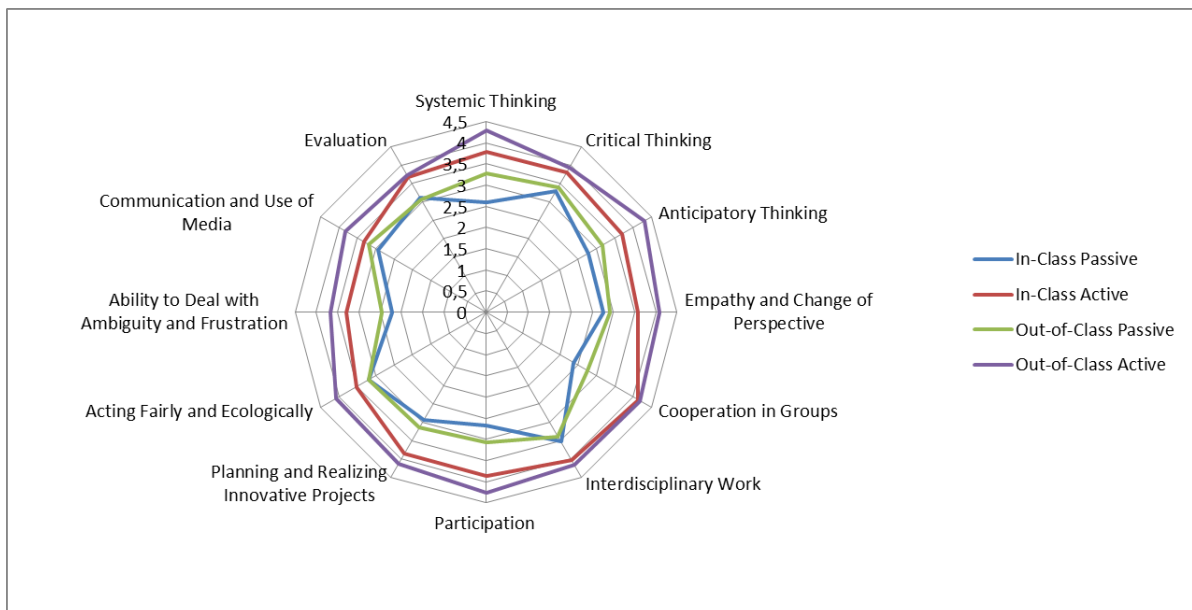


Figure 10: Where in Formal HE Curricula Respondents Feel They Could Best Gain Knowledge and Skills Necessary for SD Competencies

5. DISCUSSION

The HUB-SENSD collaboration and outcomes of that collaboration provide valuable insight for HEIs interested in activating their student population and fostering student leadership for SD. The student organizers, event participants, and survey respondents represent a student population that already values the themes of SD and is engaged in the topic on some level. Therefore, the student perspectives presented here represent the perspectives and insights of HE students that are likely to be change agents for SD.

5.1 HUB-SENSD COLLABORATION

From the perspective of SENSD

The following quote from SENSD Belgium Country Coordinator, Lisa Rothe, encapsulates how the HUB-SENSD collaboration was from the perspective of the SENSD student organizers.

Since the founding of SENSD in 2010, organizing a side-event in the framework of the EDD was the most complex project SENSD encountered. SENSD is an international organization exclusively led by students. Hence, the planning, organizing, and execution of this event challenged the network with respect to work coordination, commitment, limited time and financial resources, and organizational structure and internal workflows. While SENSD Europe is a rather strong network, the local group of SENSD Belgium is still in its infancy. Therefore, it was rather complicated and time consuming to coordinate and communicate between the entire network and other collaborating organizations and institutions. Furthermore, as most SENSD members did not have direct contact with the project with respect to the physical distance, the directly involved students of SENSD Belgium experienced a lack of commitment and support of other SENSD members. Students had to deal with a high stress level, due to other responsibilities like exams, assignments, student jobs, etc. Nevertheless, by experiencing the entire process of evolving such an event, SENSD students gained a great knowledge about event and grant applications, collaboration with other organizations and institutions, effective compromising due to time and financial limitations, time management, internal coordination—including possible improvements of the structure and workflows of SENSD—networking, marketing, and media use. SENSD appreciates the close collaboration with HUB and realizes that without the support of HUB the planning, organization and execution of a project of that size would not have been feasible for the networks current composition. (Lisa Rothe, SENSD Belgium)

From the Perspective of HUB

The HUB personnel learned many of the same lessons that the SENSD students did regarding the complexity of planning, organizing, and executing an event with multiple funding sources and multiple organizing institutions. Additionally, the HUB personnel had to balance the request from SENSD to maintain control over planning and organizing processes, and the content of the event, with the fact that students' time and professional experience is limited. At times the students' expectations were not reasonable with limiting factors like budget, time, or available human/technological resources.

Fostering Student Leadership

As described above, the concept of authentic leadership—a process that draws from both positive psychological capacities and a highly developed organizational context, which results in both greater self-awareness and self-regulated positive behaviors on the part of leaders and associates, fostering positive self-development—clarifies the role of individual responsibility in the TLS framework (Cavagnaro and Curiel, 2012). The collaboration between HUB and SENSD presented SENSD

organizers a highly-developed organizational context wherein which they were given real responsibility to implement a project. Here, a distinction should be made between responsibility and autonomy. Although SENS D organizers were given responsibility to design content, participate in all process, take ownership of the event, etc., the HUB provided constant support, helped students deal with challenges as they arose, and “filled in the gaps” when limitations of time, experience, etc. hindered student organizers’ ability. HEIs that wish to foster student leaders need to be prepared to allow for learning to occur during planning, organizing, and executing process—supporting such learning takes additional time and must allow for imperfections.

During the event, it became clear that even students actively engaged in sustainability had dramatically varying levels of background knowledge and awareness on the topic. This made discussions between experts and students at times difficult—students with limited knowledge of advanced topics could not always follow high-level discussions, whereas students with deeper understandings of topics could become weary with shallow discussions. Here we see firsthand, that an early integration of SD in curricula is beneficial when HEIs want to engage with students and foster.

Creating an engagement interface (Fear and Sandmann, 2001) is not necessarily an easily accepted concept for a HEI to execute. As Bawden (2004) points out, the lay-expert knowledge divide includes issues like legitimacy issues regarding “lay” knowledge. Whereas a professor might feel comfortable in the traditional role of provider of knowledge to students; the role of receiver of knowledge from students might be new and uncomfortable, hence discouraging participation from the side of the HEI. In addition, these learning spaces outside the formal curricula face another barrier—in HEIs extra curricula activities must compete for students’ and professors’ time, and heavily-loaded academic schedules do not always afford the luxury of extra time.

5.2 BUILDING FUTURE CURRICULA

The Building Future Curricula event presents valuable outcomes that will further be explored here. Interestingly, the occupational application of sustainability with the highest perceived likelihood of being encountered in respondents’ future career is “business ethics” (average value 4.09; StDev 1.24). This theme corresponds with the SENS D student organizers’ emphasis in the preparation of the Building Future Curricula event on the economic pillar. Business ethics is followed closely by labor practices (average value 4.02; StDev 1.14). Here students’ concern with topics that are tied to the economic and social pillars of SD counter research by Yuan and Zuo (2012), which indicates that, in general, environmental aspects of SD are perceived as being of higher priority than social SD aspects. As stated above, the student population presented here are of high likelihood to be change agents for SD. HEIs should present a holistic view of SD to these students, representative of all pillars, as these students are mature in their approach to SD and embrace the greater trend away from ecocentric views of sustainability.

The outcomes of the student-led workshop indicate that potential change agents would like to be further engaged with their HEI in integrating sustainability, however, challenges can prevent such interactions. Engagement from the beginning of a students’ career is necessary to foster meaningful interactions. Students’ require SD integration in their curricula early on, and the space to interact. Students do not want to be sought for input afterwards, but rather be actively involved in decision-making processes. This requires HEIs to respect student perspectives and be able to internalize them into the HEIs’ “story” of sustainability in meaningful ways. As noted above, this lay-expert knowledge divide can present challenges to the HEI. However, in order to prepare students for their future roles as leaders for sustainability under the TLS framework, HEIs need to provide such spaces for students to take on responsibility for personal leadership for sustainability.

The survey results indicate that students feel competencies related to systems thinking will be the most relevant in their future careers. However, their mastery of systematic thinking is only modest, whereas mastery of cooperation in groups, as well as, empathy and change of perspective is the highest. The ability to deal with ambiguity and frustration is the least mastered (perhaps reflecting the difficulty required to mastery different competencies, or a greater trend in formal education and our society that does not allow for ambiguity). More research is needed to identify where gaps in student mastery of SD competencies are, why and how students are mastery some competencies at a higher level than others, and how competencies fit future careers. The participants of this survey think that competences for SD are best acquired by active, out-of-class activities, hence HEIs could think about how to combine theoretical in-class lectures with these out-of-class activities.

Another interesting finding of the follow-up survey was the role volunteering played in providing respondents with the knowledge and skills necessary for SD. Referring back to Hoogeveen and Winkels (1996), volunteering could be attributed as such an ideal learning opportunity for SD because student-activating teaching methods require the students to participate actively, think critically, and reflect. However, the same qualities also apply to work experience, youth organizations, and other activities. Perhaps the crux of volunteering is the non-obligatory nature of it, wherein you work towards something for the mere notion that you believe in it and value it. More research is required to understand this potential key to learning SD, and how HEIs can better foster volunteerism amongst students. Counter to this, the poor perception of secondary education by respondents as a learning opportunity for SD could also be further examined.

Additionally, further insight is required from the perspective of employees. As emphasized by the SENSD student organizers, employability is a real concern of today's students. SD themes will only become more prevalent in the occupational setting as we face environmental, social, and economic limitations. Survey participants identified business themes like ethics and labor issues as highly relevant to their future career. This could reflect the future orientation of participants, for whom the majority of which are planning future careers in the private sector. A deeper understanding of how SD competencies are applied in different sectors, and which knowledge and skills are required, would allow HEIs to better prepare students for the specifics of their future career.

6. CONCLUSIONS

Many HEIs struggle to find meaningful ways to include students in the journey of integrating sustainability and fostering student leadership for SD. In this paper, the collaboration between a Belgian HEI and a European student network was explored in an attempt to extrapolate concrete actions that allow HEIs to actively engage students for SD.

The TLS framework (Cavagnaro and Curiel, 2012) emphasizes the need for taking responsibility and accepting the role of a change agent for sustainability. Students can be apt to take on this role as change agent for SD want to engage, but peripheral roles, disregard for their "lay" knowledge, and lack of space to take responsibility can inhibit their engagement in SD in HEI. As Yuan and Zuo (2012) note, using a bottom-up approach, where students can contribute to shaping an SD activity, creates actual involvement and helps raise awareness among the student community for sustainability. HEIs need to engage student populations from the beginning of their higher education career by informing them of the HEI perspective, respecting and meaningfully incorporating their insights through engagement interfaces, incorporating SD early enough in their curricula—by means of student-activating learning, and by creating space for students to take on responsibilities for SD within the context of the HEI and beyond. The learning potential of volunteerism and active, out-of-class activities needs to be further explored and exploited by HEIs. Modern day student perceptions of SD are sophisticated, and require a holistic approach that recognizes the complex interactions of the three pillars of sustainability.

These actions require a new approach to traditional HEI-student interactions, which may present challenges to HEIs. Rather than theorizing about possible reasons for students' (lack of) commitment to SD, HEIs should look internally to see how they can better foster students to become leaders and change agents for SD. As stated by a student participant of the Building Future Curricula event, "No one is perfect, but together with great expectations, we can achieve greater things."

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REFERENCES

- Barth, M., Godemann, J., Rieckmann, M., & Stoltenberg, U. (2007). Developing key competencies for sustainable development in higher education. *International Journal of Sustainability in Higher Education*, 8(4), 416–430. doi:10.1108/14676370710823582
- Barth, M., & Timm, J. (2011). Higher Education for Sustainable Development² : Students' Perspectives on an Innovative Approach to Educational Change, 7(1), 13–23.
- Bawden, R. (2004). Sustainability as Emergence: The Need for Engaged Discourse. In: Corcoran, P. & Wals, A. Higher Education and the Challenge of Sustainability. Problematics, Promise, and Practice. Kluwer Academic, Dordrecht, The Netherlands, pp. 21-32.
- Carew, A. L., & Mitchell, C. A. (2002). Characterizing undergraduate engineering students' understanding of sustainability. *European Journal of Engineering Education*, 27(4), 37–41. doi:10.1080/0304379021016665
- Cavagnaro and Curiel, (2012) The Three Levels of Sustainability. Greenleaf Publishing.
- Cortese, A. D. (1997). The Critical Role of Higher Education in Creating a Sustainable Future. *Planning for Higher Education*, 15–22.
- Emanuel, R., & Adams, J. N. (2011). College students' perceptions of campus sustainability. *International Journal of Sustainability in Higher Education*, 12(1), 79–92. doi:10.1108/14676371111098320
- Fear, F. and Sandmann, L. (2001-2). The 'new' scholarship: Implications for engagement and extension. *Journal of Higher Education Outreach and Engagement* & (1 and 2): 29-39.
- Global Reporting Initiative, 2011. Sustainability Reporting Guidelines. Version 3.1. Global Reporting Initiative, Amsterdam, The Netherlands. Retrieved on April 10, 2013 from <https://www.globalreporting.org/resourcelibrary/G3.1-Guidelines-Incl-Technical-Protocol.pdf>.
- Haan, G. De. (2010). The development of ESD-related competencies in supportive institutional frameworks. *International Review of Education*, 56, 315–328. doi:10.1007/s11159-010-9157-9
- Hoogeveen P. & Winkels J. (1996). Het didactische werkvormenboek. Variatie en differentiatie in de praktijk. [Teaching Methods Book. Variation and differentiation in practice.] Assen: Van Gorcum.
- Kagawa, F. (2007). Dissonance in students' perceptions of sustainable development and sustainability: Implications for curriculum change. *International Journal of Sustainability in Higher Education*, 8(3), 317–338. doi:10.1108/14676370710817174
- Lambrechts, W., Mulà, I., Ceulemans, K., Molderez, I., & Gaeremynck, V. (2012). The integration of competences for sustainable development in higher education: an analysis of bachelor programs in management. *Journal of Cleaner Production*. doi:10.1016/j.jclepro.2011.12.034
- Lambrechts, W., Van den Haute, H., Vanhoren, I.(2008). Making progress towards sustainable higher education: design of an implementation model with guiding principles.
- Lidgren, A., Rodhe, H., & Huisingsh, D. (2006). A systemic approach to incorporate sustainability into university courses and curricula. *Journal of Cleaner Production*, 14(9-11), 797–809. doi:10.1016/j.jclepro.2005.12.011
- Lozano, R., Lukman, R., Lozano, F. J., Huisingsh, D., & Lambrechts, W. (2011). Declarations for sustainability in higher education: becoming better leaders, through addressing the university system. *Journal of Cleaner Production*. doi:10.1016/j.jclepro.2011.10.006

- Lukman, R., & Glavič, P. (2006). What are the key elements of a sustainable university? *Clean Technologies and Environmental Policy*, 9(2), 103–114. doi:10.1007/s10098-006-0070-7
- Moore, J. (2005). Seven recommendations for creating sustainability education at the university level: A guide for change agents. *International Journal of Sustainability in Higher Education*, 6(4), 326–339. doi:10.1108/14676370510623829
- Nejati, M., & Nejati, M. (2012). Assessment of sustainable university factors from the perspective of university students. *Journal of Cleaner Production*, 1–7. doi:10.1016/j.jclepro.2012.09.006
- Newport, D., Chesnes, T., & Lindner, A. (2003). The “environmental sustainability” problem: ensuring that sustainability stands on three legs. *International Journal of Sustainability in Higher Education*, 4(4), 357-363.
- Ng, E. S., & Burke, R. J. (2010). Predictor of Business Students’ Attitudes Toward Sustainable Business Practices. *Journal of Business Ethics*, 95(4), 603–615. doi:10.1007/s10551-010-0442-0
- Rieckmann, M. (2012). Future-oriented higher education: Which key competencies should be fostered through university teaching and learning? *Futures*, 44(2), 127–135. doi:10.1016/j.futures.2011.09.005
- Rieckmann, M. (2011). Schlüsselkompetenzen für eine nachhaltige Entwicklung der Weltgesellschaft. Ergebnisse einer europäisch-lateinamerikanischen Delphi-Studie. *GAIA*, 20 (1), 48–56.
- Tilbury and Mulà, (2011) (eds.). *National Journeys towards Education for Sustainable Development*. UNESCO, Paris.
- Velazquez, L., Munguia, N., Platt, A., & Taddei, J. (2006). Sustainable university: what can be the matter? *Journal of Cleaner Production*, 14(9-11), 810–819. doi:10.1016/j.jclepro.2005.12.008
- Wiek, A., Withycombe, L., & Redman, C. L. (2011). Key competencies in sustainability: a reference framework for academic program development. *Sustainability Science*, 6(2), 203–218. doi:10.1007/s11625-011-0132-6
- Wright, T. (2004). The evolution of sustainability declarations in higher education. In: Corcoran, P. & Wals, A. *Higher Education and the Challenge of Sustainability. Problematics, Promise, and Practice*. Kluwer Academic, Dordrecht, The Netherlands, pp. 7-14.
- Wright, T. S. A. (2002). Definitions and frameworks for environmental sustainability in higher education. *International Journal of Sustainability in Higher Education*, 3(3), 203–220. doi:10.1108/14676370210434679
- Yuan, X., & Zuo, J. (2012). A critical assessment of the Higher Education For Sustainable Development from students’ perspectives – a Chinese study. *Journal of Cleaner Production*. doi:10.1016/j.jclepro.2012.10.041

Appendix 1. Occupational Applications of Sustainability (GRI, 2011)

Occupational Application of Sustainability
Business Ethics <i>business ethics focuses on conducting business in an honest and fair manner; includes: anti-corruption measure, anti-competitive, anti-trust measures, and public policy positions</i>
Labor Practices <i>based on decent work; includes: benefits, maternity or sick leave policy, employee training and lifelong learning/career development, physical and mental well-being of employees, and relations between management and labor</i>
Human Rights <i>impacts organization has on civil, political, economic, social, and cultural human rights of stakeholders; attention to investment and procurement practices—child labor, indigenous rights, freedom of bargaining</i>
Product Responsibility <i>customer health and safety, marketing, and customer privacy</i>
Diversity and Equal Opportunity <i>diversity of age, gender, ability; fair and equal hiring practices, salary, and promotion</i>
Compliance with Environmental Laws & Regulations <i>local, regional, national, and international laws pertaining to environmental issues</i>
Compliance with Social Laws & Regulations <i>local, regional, national, and international laws pertaining to societal issues</i>
Stakeholder Inclusiveness <i>process of engaging organization's stakeholders—making information available, seeking feedback, including input/concerns of stakeholders in decision-making processes</i>
Climate Change <i>global changes in temperature due to greenhouse effect; ecological, social, and economic implications</i>
Compliance with Financial Laws & Regulations <i>local, regional, national, and international laws pertaining to financial issues</i>
Energy <i>Indirect and direct energy use; future energy availability</i>
Globalization <i>integrated global economy; flow of goods and people</i>
Limited Natural Resources <i>biotic and abiotic resources; ecosystem services</i>
Security <i>security concerns of workplace and employees</i>
Profitability <i>ability to generate profits and return to investors</i>
Pro Bono Engagement <i>non-paid/charitable work</i>
Human Migration <i>Movement of people for economic, political, or other reasons</i>
Mobility <i>transportation of workforce</i>

Appendix 2. Competencies for Education for Sustainable Development (Adapted from Rieckmann, 2011)

<p>Systemic Thinking <i>ability to identify and understand connections; think connectively; be able to deal with uncertainty</i></p>	<p>Participation <i>ability to identify scopes of creativity and participation; be able to participate in the creation of initiatives</i></p>
<p>Critical Thinking <i>ability to look at the world, challenge norms, practices, and opinions; reflect on one's own values and actions; give opinions to others; understand external perspectives</i></p>	<p>Planning and Realizing Innovative Projects <i>develop ideas and strategies; plan and execute projects; show willingness to learn for innovation; ability to deal with, and reflect on possible risks</i></p>
<p>Anticipatory Thinking <i>develop visions, apply precautionary principle, and predict flows of (re-)action; be able to deal with risks and changes</i></p>	<p>Acting Fairly and Ecologically <i>know alternatives of action; be able to orientate oneself in regards to justice, solidarity, and conversation values; reflect on possible outcomes of one's actions; take responsibility for one's actions</i></p>
<p>Empathy and Change of Perspective <i>Ability to identify own external perspectives; to deal with own and external value orientation; to put oneself in someone else's position; be able to accept diversity</i></p>	<p>Ability to Deal with Ambiguity and Frustration <i>conflicts, competing goals and interests, contradictions, and setbacks</i></p>
<p>Cooperation in Groups <i>ability to deal with conflicts; to learn from others; be able to show understanding/sympathy</i></p>	<p>Communication and Use of Media <i>ability to communicate in intercultural contexts; to deal with IT; to be able to pass criticism on media</i></p>
<p>Interdisciplinary Work <i>ability to deal with knowledge and methods of different disciplines and be able to work on complex problems in interdisciplinary contexts</i></p>	<p>Evaluation <i>ability to elaborate evaluation standards and carry out independent evaluations with respect to conflicts of interest and goals, uncertain knowledge, and contradictions</i></p>