# The Implementation of Sustainable Development in the Nordic Higher Education Institutions (HEIs)

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**Abstract** Education has a key role in sustainable future. Due to their high societal impact, universities are challenged to take a leadership role in promoting sustainability. Although many Nordic HEIs have made efforts to integrate sustainability into their operations, the current status of sustainability has remained unexplored. This paper describes how the Nordic HEIs have studied the status of sustainability by implementing a joint project in the Rio+20 framework. The project included a wide survey on the implementation of Rio+20 goals targeted to the university staff, and three interactive workshops on drivers, indicators and implementation. The results provide an insight on how the Nordic HEIs implement sustainability, highlighting the key drivers, barriers and ways to promote sustainability. Finally, the project recognized and initiated new topics for collaboration around indicators and sustainability literacy to assure the continuity of the intensive collaboration between Nordic universities. This paper encourages universities globally to find areas for collaboration and to strive together to reach more sustainable societies.

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## 1 Introduction

Education was internationally recognized as one of the key measures to manage and promote environmental protection already in the United Nations (UN) Environmental Program's (UNEP) Stockholm Conference in 1972 (UNEP 1972). The UN has thereafter emphasized the role of education in every outcome document of its world summits on sustainable development (WSSD). Higher education was addressed particularly in the outcome document "The Future We Want" of the "Rio +20" WSSD in 2012, emphasizing the enhancement of transparent and effective governance, as well as commitment of decision-makers to implement sustainable development (SD) in all university operations (United Nations 2012). The role of higher education in enabling the change is apparent also in the goals of UN's Global Action Plan, the GAP (United Nations 2014), which followed the Decade of Education for Sustainable Development 2005–2014 (United Nations 2006).

Higher education institutions (HEIs) have for decades implemented sustainable actions in their operations (Wright 2002; Lozano et al. 2013). To communicate the engagement, HEIs have signed numerous voluntary declarations (Lozano et al. 2013). The most recent commitment, the Rio+20 Higher Education Sustainability Initiative (HESI 2012), consists of integrating SD into research, campus operations, teaching and outreach, being thus the first declaration to include an aspect of education for sustainable development (ESD).

The Nordic countries, including Denmark, Finland, Iceland, Norway and Sweden, are renowned for their socio-economic model embracing equality, high-level education and research, technological development and SD (Maassen et al. 2008). The region is additionally considered highly innovative and competitive (Nordic Council of Ministers 2010; European Commission 2015). Although the region has enhanced sustainability collaboratively for decades, and targets at leading the way in ESD (Nordic Council of Ministers 2009, 2011), the Nordic HEIs were lacking organized collaboration around SD until 2012, when Aalto University and the Universities of Copenhagen, Gothenburg, Iceland and Oslo established the Nordic Sustainable Campus Network (NSCN). NSCN gathers together sustainability experts working in the Nordic HEIs to share experiences in the framework of greening the campus and ESD. The Nordic Council of Ministers (NCM) provided financial support for the establishment of NSCN, which currently comprises 42 Nordic HEIs.

Twelve Nordic HEIs have signed the Rio+20 HESI initiative. Furthermore, both Nordic and national strategies have been recognized to include targets for ESD to implement UN commitments (Holm et al. 2012). However, comprehensive knowledge from the Nordic HEIs is lacking on how the strategies, and targets defined in the Rio+20 WSSD and Rio+20 HESI initiative, are implemented. Therefore, the founding members of the NSCN, KTH Royal Institute of Technology (Sweden), and Lappeenranta University of Technology (Finland), carried out a project called "Rio+20 implementation in the Nordic HEIs". Aalto University coordinated the NCM-funded project during 2014–2015. The project aimed at understanding how the Nordic HEIs approach sustainability in their operations, and recognizing the central drivers and barriers in the implementation of SD. This paper presents the main findings of the survey and workshops realized in the project, and discusses the future prospects in promoting SD in the Nordic HEIs.

## 2 Theoretical Framework

Universities educate the next generation of decision-makers and influencers. Therefore, universities can have a vastly greater impact on SD than any other single sector of society (Chambers 2009). Many authors have identified the need for an institutional approach to sustainability to enhance the integration of SD in higher education (Cortese 2003; Koester et al. 2006; Lozano 2006a; Mcmillin and Dyball 2009). Cortese (2003) defined a university system to consist of four dimensions (education, research, university operations and external community), underlining the necessity to understand the interdependence among these dimensions in achieving a transformative change. It seems, according to literature reviews by Ramos et al. (2015) and Wals (2014) that universities have moved towards better levels of sustainability integration during the past decades, but the development concerns widely the improving of the ecological footprint of a university, while measures to promote ESD are only emerging.

Some of the measures investigated recently include awareness-raising (Barth and Rieckmann 2012), recognizing key competences and embedding sustainability aspects into learning outcomes of courses (Svanström et al. 2008). Additionally, integrating ESD through audited systems, such as universities' quality assurance system (Holm et al. 2014) and an environmental management system EMS (Sammalisto 2007), is an emerging field especially in the Nordic countries. According to Sammalisto and Brorson (2008), an EMS promotes the integration particularly through the communications and training of university staff during its establishment process.

However, many challenges exist in the integration of ESD, specifically overcrowded curricula and limited teacher qualifications (Jones et al. 2008; Læssøe et al. 2009), limited resources and low commitment of university management (Leal Filho 2011). According to Sammalisto (2007), top management has a key position in the change towards SD—management should have a vision on future

development and an understanding of SD. The literature review by Holm et al. (2015) supports this conclusion, finding committed management one of the key drivers for ESD. Ferrer-Balas et al. (2008) argued, however, that good leadership alone is insufficient in reaching a transformative change, which requires additional drivers, such as incentive structures, good coordination and societal pressure. Moreover, numerous other factors have been recognized to promote ESD, including both top-down (clear vision, strategy, indicators, coordination), and bottom-up mechanisms (interdisciplinary research and projects, collaboration, motivated individuals) (Velazquez et al. 2005; Ralph and Stubbs 2014; Cebrián et al. 2015; Holm et al. 2015).

The Nordic countries have had a joint strategy for SD since 2001, in which the role of higher education in promoting ESD is emphasized (Nordic Council of Ministers 2013). However, Sweden is the only country steering sustainability in HEIs through governmental actions; the Higher Education Act from 2006 states that universities shall promote SD in their activities. There is also a regulation on environmental management in government agencies, which has led to many Swedish universities establishing a certified EMS (Sammalisto 2007). A majority of research concerning SD in the Nordic HEIs has concentrated on Swedish case examples, which support the role of good leadership, clear strategy, EMS and collaboration in successful integration of SD (Sammalisto 2007; Holm et al. 2012; Holmberg et al. 2012). However, also international and Nordic comparative studies on SD in campus operations and teaching are available (Ferrer-Balas et al. 2008; Segalas et al. 2009; Eriksson et al. 2014).

Despite many SD-related and cross-institutional measuring tools and rating systems exist (Shriberg 2002; Lozano 2006b; Roorda and Martens 2008; Lozano and Peattie 2009; Dahl 2012), comparing sustainability performance is not an easy task. The project thus concentrated on investigating sustainability at a very general level, using selected indicators to represent the focus areas of SD and two dimensions of the Rio+20 HESI initiative, namely the NSCN-supported areas of campus operations and teaching.

## 3  Research Methods and Methodology

### 3.1  The Project Survey

The project started with surveying the views of Nordic university staff on the integration of SD and its drivers and barriers. The survey was implemented as an online questionnaire using Webropol in October–November 2014, and distributed to all Nordic HEIs through national SD-networks, the presidents of the HEIs, NSCN mailing-list and website, The Nordic Association of University Administrators' (NUAS) LinkedIn-group, and the NCM's channels.

The respondents identified drivers and barriers by open-ended questions. The institutions' sustainability was estimated using Likert-type scales on given

statements related to focus areas of SD, campus operations and teaching. The scales used were:

- In focus areas: 1 = Core issue of my institution, 2 = Important issue for my institution, 3 = Not urgent and can wait for implementation
- In overall level of SD integration: 1 = Not at all integrated, 2 = Integration in a starting stage, 3 = Planning stage, 4 = Operational stage, and 5 = Institution has reached its targets
- In campus operations and teaching: 1 = Entirely disagree, 2 = Mostly disagree, 3 = Do not agree or disagree, 4 = Mostly agree 5 = Entirely agree.

The focus areas and assessed statements were defined by the partners and the steering committee of the project, consisting of 15 sustainability experts working in the Nordic HEIs and the Finnish Ministry of the Environment. In order to limit the answering-time, and to receive responses from the experts on the particular issues, some questions were targeted only to specific respondent groups, e.g.: the administrative staff did not participate in the ESD-related evaluations, drivers and barriers, and teachers in the campus operations-related assessments. All findings of the survey were compiled into a comprehensive survey report (Karvinen et al. 2015), keeping the institutions and respondents unidentified.

## 3.2 The Workshops

The project included three events for collecting information, sharing of experiences and promoting the integration of SD: the Copenhagen, Gothenburg and Oslo workshops (Table 1). These workshops included high-level presentations on global sustainability targets and the Rio+20 process in order to distribute information on the global SD-agenda. In the Copenhagen workshop, the same scale was used as in the questionnaire to evaluate the overall level of SD integration.

## 3.3 Limitations

The methods used in the project were chosen to support NSCN focus areas, excluding widely two dimensions from the Rio+20 framework, namely research and outreach. The indicators in the survey were additionally generalized, providing only an overview of SD in the Nordic HEIs rather than detailed information. Moreover, the channels used in distributing the survey were insufficient in reaching a representative sample of the whole Nordic university community, and are additionally mostly targeted at staff members already interested in sustainability. Thus, the authors acknowledge that the views of the respondents may be biased in this respect. Furthermore, since the questions concerning SD in campus operations and teaching were evaluated partly by different respondent groups, the results from

**Table 1** The details on the target groups, aims and methods of each project workshop

Workshops of the Nordic "Rio+20"-project

| Name and place of the workshop | Duration | Target group | Aim of the workshop | Methods used |
|---|---|---|---|---|
| Copenhagen workshop at the University of Copenhagen, Denmark, Oct 2014. Arranged as a part of Making Universities Sustainable Conference arranged by the International Alliance of Research Universities (IARU) | 90 min | Nordic and international university staff members working with sustainability | To survey the level of SD integration in universities globally and to explore, which drivers and barriers are affecting the integration, coming up with suggestions to promote SD | Short introductory presentations on drivers, and group work with prepared tasks, facilitated by a project partner |
| Gothenburg workshop at the University of Gothenburg, Sweden: "If you can't measure it, you can't manage it—is this true?" May 2015 | 2 full days | Nordic university staff members responsible for sustainability/environmental issues | To benchmark Nordic universities' measuring, reporting and managing practices relating to SD, and to identify new areas for Nordic collaboration, especially around indicators | Case example—presentations and interactive group work with prepared tasks |
| Oslo Workshop at the University of Oslo, Norway, Nov 2015 | 1, 5 days | Nordic university staff members and students involved with or interested in sustainability in Nordic HEIs, and other relevant stakeholders | To present an overview on Nordic HEIs' sustainability, summarize the "Rio+20"-project and to plan how to use the results of the survey at national, Nordic and international levels | Keynotes on SD in higher education, case examples on strategy, teaching and student engagement, and group work first in national, then in mixed groups |

these questions are incompletely comparable. The views of different respondents within a respondent group may also vary, which was excluded from the analyses and the focus of this paper.

## 4 Results

### 4.1 The Number of Institutions and Experts Engaged in the Project

The project reached numerous Nordic HEIs and their staff members, i.e. practitioners and teachers, to collaborate around sustainability in the Rio+20 framework (Table 2). In total, 59 Nordic and six international HEIs, and ten other stakeholders took part in the project workshops and the survey (Table 2). Since every workshop

**Table 2** The number of participants in each project activity, and the list of HEIs involved in the project

| Number of participants in the four project activities | |
|---|---|
| 1. The project survey | 152 respondents from 52 Nordic HEIs |
| 2. Copenhagen workshop | 24 participants from 10 Nordic and 4 international HEIs |
| 3. Gothenburg workshop | 27 participants from 13 Nordic and 1 international HEIs |
| 4. Oslo workshop | 47 participants from 26 Nordic and 1 international HEIs |
| **The higher education institutions involved in the project** | |
| *Denmark* | Oslo and Akershus University College of Applied Sciences |
| Aalborg University | Oslo College University |
| Copenhagen Business School CBS | Rudolf Steiner University College, Norway |
| Roskilde University | University of Agder |
| Technical university of Denmark DTU | University of Bergen |
| University College Zealand | University of Oslo |
| University of Copenhagen | |
| | *Sweden* |
| *The Faroe Islands* | Blekinge Institute of Technology |
| University of the Faroe Islands | Chalmers University of Technology |
| | Halmstad University |

**Table 2** (continued)

| | |
|---|---|
| *Finland* | Jönköping University |
| Aalto University | Karolinska Institute |
| Arcada University of Applied Sciences | Kristianstad University |
| Hanken School of Economics | KTH Royal Institute of Technology |
| Helsinki Metropolia University of Applied Sciences | Linnaeus University |
| Karelia University of Applied Sciences | Lund University, Sweden |
| Lahti University of Applied Sciences | Mid Sweden University |
| Lappeenranta University of Technology | Stockholm University |
| Laurea University of Applied Sciences | Södertörn University |
| Martti Ahtisaari Institute at Oulu Business School | University of Borås |
| Novia University of Applied Sciences | University of Gothenburg |
| Oulu university of applied sciences | University of Gävle |
| Saimaa University of Applied Sciences | University West |
| Satakunta University of Applied Sciences | Uppsala University |
| Savonia University of Applied Sciences | |
| Tampere University of Applied Sciences | *International universities* |
| Tampere University of Technology | Cornell University, USA |
| Turku University of Applied Sciences | Ghent University, Belgium |
| University of Eastern Finland | HFT Stuttgart, Germany |
| University of Helsinki | National University of Singapore |
| University of Tampere | University of Zagreb, Croatia |
| University of Turku | KEDGE Business School, France |
| Abo Akademi University | |
| | *Other participated stakeholders* |
| *Iceland* | Aalto University Properties Ltd, Finland |
| Bifrost University | CSR Västsverige, Sweden |
| Holar University College | Forum for Nature Protection, Norway |
| University of Iceland | Foundation for Environmental Education FEE, Norway |
| | Spire, youth organization for sustainable use of resources, Norway |
| *Norway* | Tvergastein/Centre for Development and the Environment, Norway |
| Norwegian School of Sport Sciences | The Nordic Council of Ministers, Denmark |
| Norwegian University of Life Science | NUAS, The Nordic Association of University Administrators, Norway |
| Norwegian University of Science and Technology | The UN—UNEP/GUPES (by video), Kenya |
| Norwegian University of Science and Technology NTNU | The Sustainability Literacy Test, SuLiTest, France |

and the survey introduction letter presented the global background of the project, information on the UN Rio+20 process was successfully distributed to a wide Nordic university community.

## 4.2 Outcome of the Survey

### 4.2.1 Implementation of SD

According to the majority of the respondents, energy efficiency is the most important SD-related issue for the Nordic HEIs (Fig. 1). Research on sustainable solutions and recycling are almost as important. Campus accessibility, renewable energy and changing behavior are considered moderately important, whereas campus biodiversity and educating teachers in sustainability are among issues that are not urgent.

According to the results, the overall level of integrating SD is only moderate (Fig. 2). Only 3 % of the respondents saw that their institution has reached its own targets (5/5). However, 43 % of the respondents estimated that their institution was at an operational level (level 4/5), whereas 16 % considered their HEI was at a planning level (3/5). On the contrary, 13 % found their institution to be at a zero-level (1/5) and 25 % only in a starting stage (2/5). Furthermore, sustainability implementation in campus operations and teaching appeared as very modest (Fig. 2). However, the situation seemed to be better in campus operations (score 3,2) compared to teaching (score 2,8).
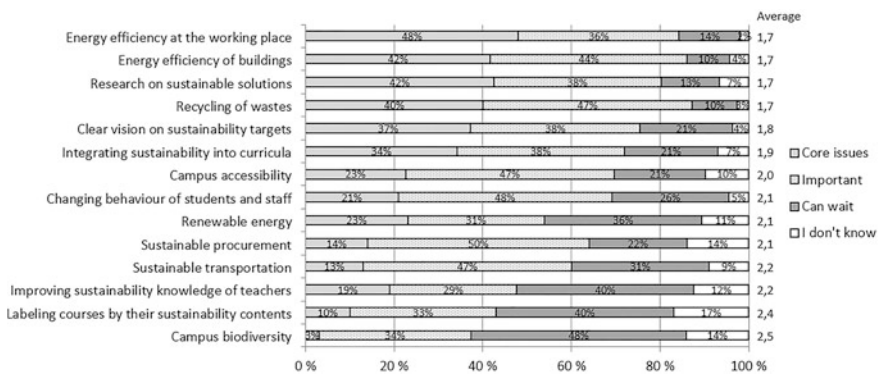


**Fig. 1** The focus areas relating to SD (modified from Karvinen et al. 2015). Respondents (n = 152) evaluated the areas using a scale from 1 to 3, where: *1* core issue of my institution, *2* important for my institution, *3* not urgent and can wait for implementation ("Can wait"). I don't know-responses were excluded from averages

Implementation of sustainable development into campus operations and teaching
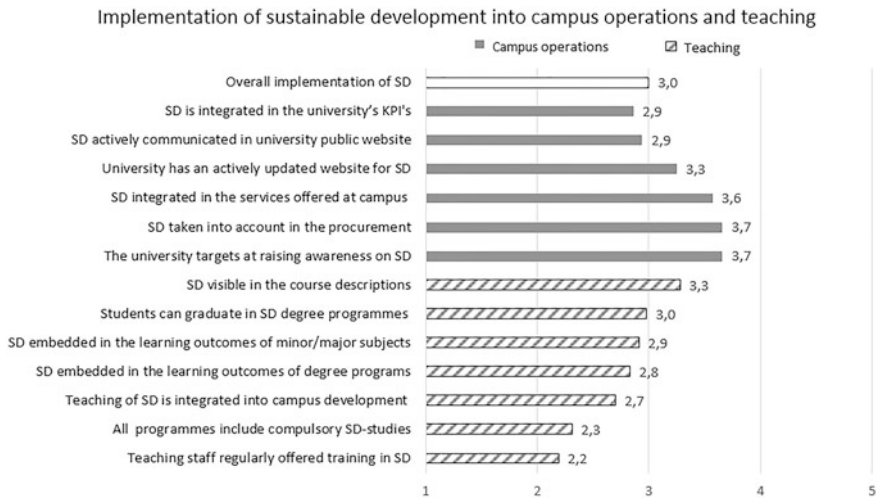


**Fig. 2** Results from the survey: Scores based on survey respondents' evaluations on the implementation of SD in the Nordic HEIs (modified from Karvinen et al. 2015). Indicators measuring SD in teaching evaluated by teachers and environmental staff (n = 89) and indicators on campus operations' sustainability evaluated by administrative and environmental staff (n = 82). Evaluation scale: *1* entirely disagree, *2* mostly disagree, *3* do not agree or disagree, *4* mostly agree, *5* entirely agree. I don't know-responses were excluded from the scores. Overall implementation evaluated by all respondents (n = 152); scale: *1* not at all integrated, *2* starting stage, *3* planning stage, *4* operational stage, *5* have reached institution's targets

### 4.2.2 Key Drivers and Barriers in Implementing SD

The responses to open-ended questions gave a good picture on the views of the Nordic university staff (Fig. 3). According to them, policy and management-related issues both enable and hinder the implementation of SD, though management practices and organization seem to have a stronger hindering than enabling effect. Of all the respondents, 54 % recognized the lack of resources as a clear barrier.

Knowledge and attitudes seem to have a substantial effect on sustainability. The respondents indicated specifically the attitudes of decision-makers and an unsupportive attitude in general as factors preventing the implementation, whereas skilled and motivated staff were considered to drive sustainable actions. In addition, collaborative efforts, such as student involvement and projects, enable the implementation of SD, while the lack of collaboration between disciplines is hindering it.

Very similar measures were suggested to enhance the drivers and overcome the barriers (Fig. 4), particularly communications and awareness-raising. Furthermore, clarifying the strategy and targets related to SD, and having more resources were identified as important measures. About a third of the respondents called for more engaged and supportive leaders, and almost as many respondents suggested better educated staff as a means to overcome the barriers.
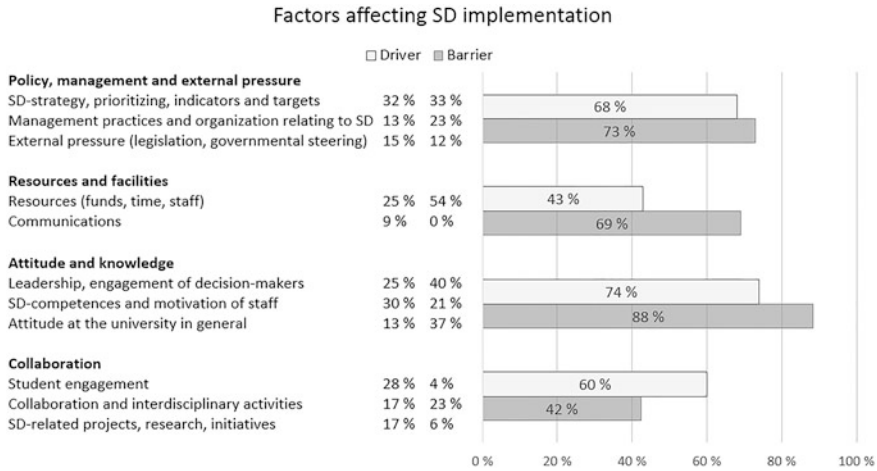
**Factors affecting SD implementation**

☐ Driver  ▨ Barrier

**Policy, management and external pressure**

| | Driver | Barrier | |
|---|---|---|---|
| SD-strategy, prioritizing, indicators and targets | 32 % | 33 % | 68 % |
| Management practices and organization relating to SD | 13 % | 23 % | 73 % |
| External pressure (legislation, governmental steering) | 15 % | 12 % | |

**Resources and facilities**

| | Driver | Barrier | |
|---|---|---|---|
| Resources (funds, time, staff) | 25 % | 54 % | 43 % |
| Communications | 9 % | 0 % | 69 % |

**Attitude and knowledge**

| | Driver | Barrier | |
|---|---|---|---|
| Leadership, engagement of decision-makers | 25 % | 40 % | 74 % |
| SD-competences and motivation of staff | 30 % | 21 % | 88 % |
| Attitude at the university in general | 13 % | 37 % | |

**Collaboration**

| | Driver | Barrier | |
|---|---|---|---|
| Student engagement | 28 % | 4 % | 60 % |
| Collaboration and interdisciplinary activities | 17 % | 23 % | 42 % |
| SD-related projects, research, initiatives | 17 % | 6 % | |

0 %   20 %   40 %   60 %   80 %   100 %

**Fig. 3** Results from the survey: barriers and drivers affecting the implementation of SD in the Nordic HEIs (modified from Karvinen et al. 2015). The percentage of respondents (barriers n = 52, drivers n = 53) in the four main driver/barrier-categories (presented as *bars*), and the detailed classification under the main categories
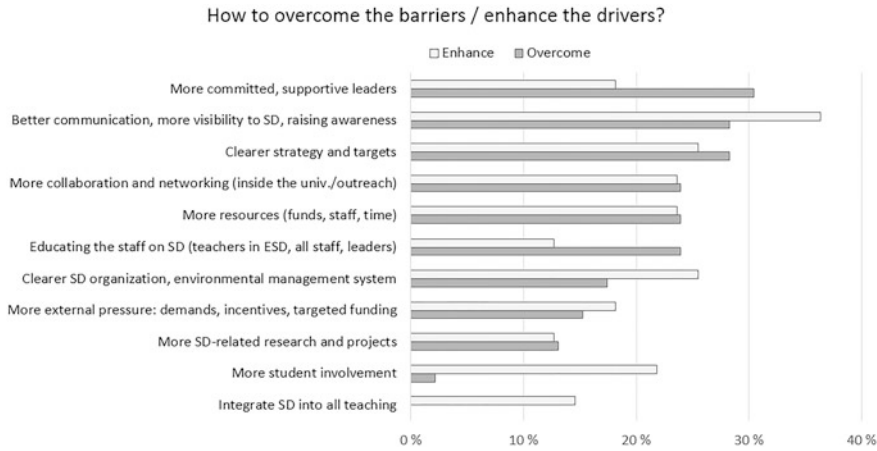
**How to overcome the barriers / enhance the drivers?**

☐ Enhance  ▨ Overcome

More committed, supportive leaders
Better communication, more visibility to SD, raising awareness
Clearer strategy and targets
More collaboration and networking (inside the univ./outreach)
More resources (funds, staff, time)
Educating the staff on SD (teachers in ESD, all staff, leaders)
Clearer SD organization, environmental management system
More external pressure: demands, incentives, targeted funding
More SD-related research and projects
More student involvement
Integrate SD into all teaching

0 %   10 %   20 %   30 %   40 %

**Fig. 4** The suggestions of the respondents on how to enhance the drivers or overcome the barriers recognized in the previous question of the survey. N (enhance) = 55, n (overcome) = 46. (Modified from Karvinen et al. 2015)

### 4.3  Findings of the Copenhagen and Gothenburg Workshops

#### 4.3.1  Implementation of SD

In the Copenhagen workshop, 48 % of the participants indicated operational level, 33 % a level between planning and operational, 5 % planning level and 14 % zero-level to be their institution's level of integrating SD. The result supports the findings of the survey.

In the Gothenburg workshop the main outcome was that indicators measuring ecological sustainability are more generally used than the ones measuring social sustainability. Furthermore, the participants recognized a need to develop better indicators for research and teaching, with easily accessible sustainability criteria for labelling of courses and programs by their SD contents. The workshop also resulted in a project plan to develop joint Nordic key word-list for searching SD-related research for reporting.

#### 4.3.2  Drivers and Barriers to the Implementation of SD

The participants of the Copenhagen workshop identified numerous drivers and barriers, as well as means to enhance the drivers and overcome the barriers (Table 3). The most driving forces to sustainability were university-level and national-level SD-strategies, financial resources and EMSs. Better leadership, cost-benefit analyses and change in financial models were among suggested means to promote the drivers.

Unwillingness to change, university hierarchy, and lack of commitment and knowledge were the barriers that the working-groups mentioned most frequently, while incentives, top-down-processes and political cleverness were the most commonly suggested solutions to overcome these.

### 4.4  The Oslo Workshop

In the final workshop, the NSCN presented a new project on sustainability literacy of the Nordic students, which was developed based on the preliminary findings of the survey. The workshop participants set the goal for universities to lead the way and to reach 100 % sustainability. They also recognized severe challenges, including contradictory targets (e.g. $CO_2$-reduction and internationalization), lack of mandate to make changes, and lack of engaged leaders and resources. Finally, they suggested solutions for the Nordic HEIs to use the project results and to promote sustainable actions in:

1. Sharing and benchmarking

   – Sharing best practices recognized in the survey: for instance, Norway could be consulted in campus biodiversity and Sweden in ESD

   – More common guidelines and rankings for Nordic universities.

**Table 3** Drivers and barriers identified in the Copenhagen workshop (five groups with 4–5 participants in each)

| List of drivers and barriers identified in the Copenhagen workshop | |
|---|---|
| **Drivers** | **How to enhance the drivers** |
| Strategy of the university (4) | Better leadership (2) |
| National strategy for SD (3) | Cost-benefit anayses (2) |
| Financial and staff resources (3) | Change of financial model (2) |
| Environmental management system (3) | Connecting SD in campus operations and research (1) |
| Legislation (2) | Network of university members (1) |
| Other universities, role model (2) | Think tank (1) |
| Bottom-up processes (2) | Recognize how different individuals can contribute (1) |
| Benchmarking, best practices, rankings (2) | **Barriers** |
| Policy of the university (1) | Unwillingness to change, attitudes (3) |
| Will to implement SD (1) | Lack of commitment (2) |
| Mainstreaming, SD part of normal activities (1) | Lack of knowledge (2) |
| Internal network (1) | *Lack of resources (2)* |
| Informal connections within university (1) | Decentrialized, university hierarchy (1) |
| More people involved (1) | Too many other priorities (1) |
| Appoint faculties to SD (1) | Lack of leadership (1) |
| New programmes attracting students (1) | Lack of regulation (1) |
| Working life requirements (1) | Restructuring the organization, new management (1) |
| Circumstances and attitudes (1) | Faculty autonomy in operational areas (1) |
| Student voice (1) | **How to overcome the barriers** |
| Formal student democracy (1) | Incentives for SD-related education and research (2) |
| Staff & students activity (1) | Top-down approach (2) |
| Media (1) | Political cleverness (2) |
| Climate change (1) | Environmental management system (1) |
| Energy prices (1) | Open faculty positions with SD focus (1) |
| Waste and chemicals regulation (1) | Communications (1) |
| President's commitent (1) | Marketing (1) |
| Culture (1) | Values (1) |

Number of groups that listed a certain driver/barrier is indicated in parentheses

2. Education

- More obligatory courses on SD
- More collaboration: courses mixing countries, disciplines and institutions
- A Nordic certificate for sustainability education.

3. Student engagement

- Universities should not wait for governmental steering, but act and let the students act
- Bottom-up and top-down processes are both needed.

## 5  Discussion

Strategy emerged as one of the key drivers for sustainability in the project. However, it became clear that the implementation of SD strategies has succeeded only moderately, and the factors related to campus greening and ecological sustainability are more emphasized than SD in teaching or social sustainability. The finding is in line with a study of Aalborg University, Denmark: the focus is on administration rather than in education, research and outreach (Christensen et al. 2009). The bias to ecological sustainability may be explained by target-setting and indicators, which are commonly related to ecological factors, such as energy, $CO_2$ and paper consumption (Karvinen et al. 2015). According to Evangelinos and Jones (2009), such a lack of functional targets hinders the implementation of SD.

An interesting finding was, that although the institutions seem to target at raising awareness on SD, the respondents gave very modest estimations to SD-related communications. In fact, communications and interaction with the staff would be an efficient way to raise awareness (Sammalisto and Brorson 2008). Nordic university staff agrees with the earlier findings by Christensen et al. (2009) and Leal Filho (2011), stating that the attitudes and knowledge of decision-makers make a key barrier in the integration of SD. Therefore it would be of utmost importance to allocate resources to communications and training the staff.

However, it seems that the Nordic HEIs are allocating insufficient resources to train their teachers in sustainability, although limited teacher qualifications have been recognized to hinder the mainstreaming of ESD (Læssøe et al. 2009). On the contrary, in the survey conducted by Holm et al. (2014), 50 % of respondents evaluated that ESD competences are taught in faculties.

Establishing an EMS could lead to more structured and clearer organization, targets, and indicators. Karvinen et al. (2015) suggested, that the overall sustainability performance is at a higher level in Swedish HEIs compared to the HEIs in the other Nordic countries. The same trend was recognized between HEIs that had established an EMS according to ISO 14001, like 80 % of the Swedish HEIs responding to the survey. Sammalisto (2007) and Omrcen et al. (2013) argued that a certified EMS can function as an effective means to integrate SD in all university activities, including education. The regular audits required by a certified EMS keep the activities on the university agenda and provide opportunities for follow-up, feedback, and for further development.

## 6   Conclusions and Future Prospect

The Nordic project aimed at raising awareness on the UN Rio+20 process and higher education targets, and comprehending the approach of the Nordic HEIs to sustainability using the Rio+20 HESI initiative as a framework, addressing particularly campus operations and teaching. Furthermore, the project targeted at recognizing the key drivers and barriers in implementing sustainable development (SD). The project methods included a survey to the university staff and three interactive workshops.

The Nordic HEIs seem to be on their way in reaching the goals formulated in the Rio+20 WSSD (United Nations 2012) and Rio+20 HESI initiative (HESI 2012). However, there are still institutions that have yet to start the integration process, or are lacking proper targets, measures and commitment. Furthermore, the focus areas of SD seem to be in imbalance in the Nordic HEIs, campus greening activities being more emphasized than SD in teaching. In order to reach a balanced approach to sustainability, the targets and indicators measuring SD ought to be in balance, too. In addition, more attention should be paid to teachers' competences on SD to reach better levels of education for sustainable development (ESD). Integrating SD-related issues more efficiently in the institutions' communications, such as internal and external websites, would enhance awareness-raising.

Strategy emerged as a driving force for sustainability, but the evaluations on its implementation revealed that the strategy is either insufficient, unclear, or there are severe problems in realizing it in campus operations and teaching. According to the participants of the project, the implementation could be enhanced by both top-down and bottom-up approaches in the Nordic HEIs.

Four main conclusions to promote SD and to overcome the barriers came up. Firstly, if universities would be steered through legislation and financial, results-based incentives, the management could be more encouraged to support SD. Secondly, establishing an EMS could lead to a more structured and clearer organization of SD work. Thirdly, the Nordic HEIs should strive for more collaboration and sharing of experiences to reach better levels of sustainability. Increasing the amount of student engagement and inter- and multidisciplinary projects would raise awareness and change behavior throughout the institution. Finally, the visibility of SD and the mainstreaming of ESD could be promoted through better communications and educating the staff.

The results illustrate the fundamental need for an institutional approach to sustainability (Cortese 2003), in which deep commitment is required from the grassroots to the top management. Legislation is rarely in the hands of SD practitioners at universities, therefore each individual should be challenged to operate at the level most appropriate for them; staff members working with stakeholder relations and collaborating with governmental authorities might be more capable of affecting the governmental steering measures, while university teachers could activate the students and colleagues to create a culture of sustainability to the campus and promote the establishment of an EMS. Furthermore, since the number

of drivers and barriers identified in the project was substantial, every HEI is encouraged to identify their own individual driving and hindering factors in order to find appropriate measures to enhance sustainability. Furthermore, collaboration and benchmarking among the HEIs from the same region, as well as internationally, is highly recommendable to recognize common barriers, and to share best practices.

This research was limited to discuss on campus operations and teaching, excluding the two other dimensions in the Rio+20 framework, namely research and outreach. Moreover, the participants of the project represent only a small proportion of the whole Nordic university community, and included mostly staff already interested in sustainability. Thus, the views of the participants may be biased in this respect. Additionally, the generalized indicators used in the survey were able to give only a direction of the approach to SD of the Nordic HEIs. Finally, detailed analyses ought to be made on perceptions of different respondent groups, such as teachers from different disciplines, and administration and environmental staff, which were excluded from the focus of this paper.

In the case of the Nordic HEIs, future studies should concentrate on investigating measures to commit the university leaders to institutional sustainability, and in reforming the indicators measuring SD. Furthermore, detailed information is needed on visualizing sustainability at the HEIs, and on SD-contents of learning outcomes of courses and programs. In order to develop the curricula, it would be highly beneficial to research how the Nordic teachers address sustainability in their courses, and what is the recent level of sustainability literacy of Nordic students.

The project succeeded in creating new connections that finally led to new project proposals on sustainability literacy and indicators. To conclude, an intensive project can be considered a successful means to strengthen the collaboration among university staff, and to recognize important sustainability aspects of the HEIs in a region.

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