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Working Paper Series: Business and Law

**Working Paper No. 08**

**Raising Sustainability Awareness and Understanding  
in Higher Education**

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# **Raising Sustainability Awareness and Understanding in Higher Education**

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## **Abstract**

Sustainability has been defined by the Brundtland Commission (Brundtland, 1987) as “meeting the needs of the present without compromising the ability of future generations to meet their own needs”. In times of increasing expectations of customers, shareholders, employees, and communities as well as the general public about corporations’ contributions to sustainability (WBCSD - World Business Council for Sustainable Development), the latter are severely and continuously criticized for actions that contradict their glossy sustainability reports (Holliday, 2010). However, it is often the case that such criticism is rooted in a lack of awareness of the complexity of relationships and the role that sustainability plays within the context of a firm’s operations, particularly SMEs, which cannot dedicate major resources to cope with the issues. Therefore, the question arises of what universities can do to build awareness and understanding among students in order to prepare them to cope with sustainability aspects in their future careers (Starik *et al.*, 2010).

This paper presents findings based on quantitative and qualitative data from five consecutive cross-functional courses in sustainability for students in business, law, architecture, health management and engineering, and evaluates the extent to which their attitude and awareness changed over the course. Recommendations are given for institutions in higher education as well as for companies to follow up with further training initiatives for junior managers.

## **Introduction**

Over forty years have passed since Meadows published his book "The limits to growth" in 1972 (Meadows, 1972) in which he described three scenarios for the development of the world. It took around fifteen years for politicians to produce a clear reaction to this work through the Brundtland commission (Brundtland, 1987), and it was another ten to fifteen years before companies started to seriously consider and report on sustainability issues in their firms, as is clear from looking at company reports at CorporateRegister.com, the world's largest online directory of corporate responsibility (CR) reports. Progress in transforming findings into actions continues to be sluggish. In 2012 Ban Ki-moon, the eighth Secretary-General of the United Nations, formally opened the UN sustainable development summit in Rio de Janeiro with a warning that progress on sustainability issues is too slow (Black, 2012).

At the same time there is widespread agreement that universities in general and business schools in particular contribute to sustainable development as they help to shape the mindset and value systems of future decision makers in society (Galea, 2004, 2007; Springett, 2005; Ghoshal, 2005; Pfeffer, 2005). That several academic journals have published special issues on teaching sustainability is yet further evidence that academia recognizes the importance of teaching sustainability. The Academy of Management Learning & Education published a special issues in fall 2010 on "Sustainability in Management Education" while the Journal of Management Education published a special issue entitled "Greening and Sustainability Across the Management Curriculum" in June 2009.

In addition, students have indicated that they would rather work for a company that adopts sustainable principles and practices (Erskine and Johnson, 2012). Nonetheless, students are sceptical about the practical relevance of sustainability theory when their impression is that this theory contradicts other economic theories taught in many other classes and seminars, such as those connected with profit maximization or shareholder value (Thomas, 2005).

This paper seeks to make a contribution to the literature on teaching sustainability in business schools. More precisely, it shall evaluate the effectiveness of an interdisciplinary sustainability course by measuring how students evaluate the importance of the issue with regard to the competencies they will need in their future careers, and how the impact of such education might be improved using teaching tools.

This paper will begin with a review of teaching sustainability literature. The literature review will first focus on integrating sustainability issues into curricula, courses and modules. Next, the author shall consider the effectiveness of sustainability courses, e.g. the methods used to measure impact and results. The third part of the literature review looks at the pedagogy of teaching sustainability. There is some overlap with the second stream of research here because some works deal with both questions simultaneously. The literature review ends with a discussion about the different effects that the composition of students within a class has on the effectiveness of sustainability courses. Papers discussing issues with regard to inter-, multi-, intra- or trans-disciplinary courses are evaluated.

Based on the literature review, research propositions are given and then assessed using qualitative and quantitative data from a sustainability course held over a period of five semesters.

## **Literature Review**

Sustainability is defined in this paper in accordance with the definition given by the Brundtland Commission (Brundtland, 1987) as "meeting the needs of the present without compromising the ability of future generations to meet their own needs". Corporate sustainability is defined according to the definition given by the United Nations Global Compact (2007) as "a company's delivery of long-term value in financial, social, environmental and ethical terms".

Looking at the literature on teaching sustainability, several areas of research can be identified.

### **The extent to which business schools incorporate sustainability issues into courses**

One group of articles examines whether and how business schools incorporate sustainability into curricula and courses. Nicholls et al. (2013) examine the integration of ethics, corporate social responsibility and sustainability education into the teaching of management and marketing based on a

survey of deans and department heads and the related evaluation of the Association to Advance Collegiate Schools of Business International (AACSB). They find, perhaps unsurprisingly, that ethics, a topic whose importance has been emphasized by the AACSB since 1980, is more widely integrated than sustainability or corporate social responsibility, which has only emerged over the last decade.

In a benchmark study, Godfrey and Manikas (2009) compare the undergraduate programme on supply chain management at the University of Wisconsin Oshkosh with nineteen other supply chain and operations management programmes in the United States. They find that the subject of sustainability is rarely included either as a stand-alone course or as an element of a course found in teaching objectives or syllabi. Sharma (2013) explores the role of both the dean and faculty in facilitating sustainability in the curriculum and suggests that faculty members with a passion for sustainability should more actively bring such issues to the attention of deans and other potential internal and external stakeholders. Wu *et al.* (2010) conduct web-based content analysis, comparing management education curricula in Europe and America. They found a number of differences with regard to emphasis on sustainability on undergraduate and graduate levels, whether courses are compulsory or elective, as well as teaching methods and content. Nicholson and DeMoss (2009) conduct a survey of AACSB-accredited business schools and found that the degree of integration is insufficient and that the perceived importance of sustainability concepts is higher for marketing and management than finance and accounting disciplines. Rundle-Thiele and Wymer (2010) investigate the inclusion of ethics, social responsibility and sustainability in courses in Australia and New Zealand and find, in contrast to previous studies, that the importance of sustainability issues, as measured by the requirement of taking a mandatory stand-alone course in this area, is insufficient. Their findings are consistent with Bridges and Wilhelm (2008), who earlier stated that there is a need for a stronger focus on sustainability and suggested the inclusion of a marketing sustainability elective in the MBA curriculum. Weber (2013) notes that increasing numbers of courses are focusing on ethical, social, and sustainability issues (ESSI) but that the coverage of ESSI in these courses has not increased.

### **The effectiveness of sustainability courses – do students buy it?**

The second stream of research aims at exploring the effectiveness of sustainability courses. Erskine and Johnson (2012) studied, for instance, whether a profound understanding of sustainability concepts results in a change of attitude from students. They incorporated the student perspective by investigating how students perceive the effectiveness of different learning approaches applied by business schools that support the UN's Principles of Responsible Management Education (PRME). The more general question in this area, according to Thomas (2005), is whether students are "buying it". In this work, the author seeks to measure how the legitimacy of sustainability concepts as perceived by students is influenced by the various components of teaching, course materials, case studies and such like. He contributes a useful framework for the development of survey instruments that seek to determine whether business students are buying into the paradigm of environmental sustainability. Lämsä *et al.* (2008) explored gender differences in students' perceptions of and attitudes towards sustainability. They found that women were more favourable than male students to the stakeholder model as opposed to the shareholder model both before and after the sustainability course, and that the course made no difference to the gap that exists between men and women. It has to be noted that, in general, both genders favoured the stakeholder model, but this was more pronounced among women, however. Lourenço (2013) compares and contrasts perceptions of sustainability among business students depending on the world views they implicitly adopt. Focussing on two strands, the dominant economic-driven world view, and those who challenge this view with sustainability-driven values, he finds that business education generally continues to follow the "economic world view" and proposes a gradual shift. Using action research, Springett (2005) describes ten years of experience with a postgraduate course in "business and sustainability". Her findings suggest including a critical theory element regarding the influence of education for sustainability on sustainability courses. Because courses, to a certain extent, challenge the prevailing paradigm underlying other business courses, students' self-reflection will be encouraged, which will help to facilitate course impact.

### **The pedagogy of teaching sustainability – what works?**

The third area of work relates to the pedagogy of teaching sustainability. Here several approaches have been employed, from experience and problem-based learning to holistic approaches incorporating cognitive and emotional/spiritual methods. Benn and Martin (2010) study the role of

“boundary objects” which were defined by Wenger (1998, p. 105) as “artifacts, documents, terms, concepts and other forms of reification around which communities of practice can organize their interconnections” and argue that personal experience plays a key role in comprehending the complex nature of sustainability issues. They further report on a project whose aim was to increase awareness of sustainability among the students and faculty of an existing MBA course, arguing that involvement and customization are factors that support faculty engagement. They observed that students perceived sustainability as an issue that was addressed differently by lecturers depending on their focus and research interest, which led to confusion.

Mabry (2011) is concerned by how students’ involvement in complex sustainability issues can be heightened by employing a number of different activities in order to achieve pedagogical goals in class. She suggests including several levels of learning in order to comprehend the complex sustainability paradigm. Shrivastava (2010) holds that in order to be able to manage sustainability, students need to develop a passion for it and that this can be achieved by a holistic pedagogy combining emotional and cognitive learning. Persons (2012) reports from a sustainability course using different assignments, provides teaching tips and seeks to “encourage all business educators to start incorporating CSR and sustainability into their courses now”. Alcaraz and Thiruvattal (2010) demand experiential learning and other new learning methodologies to “create the paradigm shift needed to redefine business and management education for the future”. Buchs and Blanchard (2011) argue that the meaning of sustainability varies widely, making it difficult for students to grasp the overall meaning of the concept. They describe how to overcome this challenge by the integration of role-play based on key issues and theoretical snapshots of real-life organizations such as Grameen Bank, Greenpeace or Oxfam. Audebrand (2010) suggests that there is a need for new metaphors in teaching sustainability. Hazelton and Haigh (2010) share the experiences they made while incorporating sustainability into accounting curricula and report on their difficulties in overcoming the predominantly vocational interests of students and bringing reflexivity into the classroom given already overcrowded curricula. Wheeler *et al.* (2003) suggest the use of eLearning models to support the dissemination of sustainability issues. Bascoul *et al.* (2013) advocate the use of a novel business game based on the Life Cycle Assessment method, and finally Galea (2007) published a book dedicated on case simulations and experiential approaches to teaching sustainability.

### **Intra- multi-, inter-, or transdisciplinary courses of sustainability?**

Finally, there is a research stream concerned with investigations of inter- multi-, intra-, or transdisciplinary courses of sustainability. Intradisciplinary courses deal with issues in one functional area within a field. In business, functional areas include marketing, finance and accounting. Multidisciplinary courses combine several of these functional areas. Interdisciplinary courses bring together several fields such as business, engineering and architecture. Transdisciplinary courses involve integrating members from outside a discipline, for instance courses bringing together academia and practitioners. Shrivastava *et al.* (2013) study the role of transdisciplinary approaches in understanding sustainability, and argue that “dealing with complexity requires collaboration with multiple actors, from academia, enterprises and civil society”. Kurland *et al.* (2010) teach an interdisciplinary course in sustainability which includes disciplines such as Family and Consumer Sciences, Geography, Management, Political Science, Psychology, Recreation and Tourism, and Urban Studies. They find that each of the participating disciplines had different expectations and recommend that other institutions or faculties who seek to develop a similar interdisciplinary course in sustainability ensure that the participating faculty is morally committed to the project and willing to collaborate and share ownership. Nicholls *et al.* (2013) argue for more stand-alone courses. Stead and Stead (2010) describe how the co-evolution of disciplines supports the inclusion of sustainability into business curricula. Rasche *et al.* (2013) researched the inclusion of ethics across disciplines in MBA programmes and found that between 2005 and 2009 courses addressing ethical issues have increased; however, 75% of these new courses are elective and the results vary between disciplines. In management courses, more ethical content has been included. They suggest a more structural change towards mandatory courses as well as an inclusion of ethic-related issues in disciplines such as finance and accounting.

Borland and Lindgreen (2013) conclude that the currently prevailing anthropocentric perspective hinders the teaching of sustainability. They propose an ecocentric epistemology and the development of applications for marketing courses. Rusinsko (2010) proposes a matrix in which different

approaches towards sustainability teaching should be applied depending on resource availability, faculty commitment and the strategic goals of the business school.

### **Conclusions from the Literature Review**

Several conclusions can be drawn from the literature review. Regarding the inclusion of sustainability into curricula and courses, the results are not fully consistent but a reasonable postulation is that many universities and business schools are including sustainability concepts in programmes, albeit to different degrees. This is not surprising given the ubiquitous nature of sustainability; it plays a role in many academic disciplines as well as in the real world.

The effectiveness of teaching sustainability – in other words, what students are taking away from classes in the field – is an important issue because it may influence progress towards a more sustainable world in the future. The students of today will be the decision makers of tomorrow and therefore universities play a role in how fast or slow that progress will be. The research results show that in order to answer the question of whether students are buying the sustainability concept as a genuine one which is at least of equal importance to profit maximization depends on how such effectiveness is measured. The studies cited above use and suggest very different ways and approaches. Results show that the degree of acceptance by students varies and is dependent on, for instance, their gender and world view. More research on this topic is needed.

The next conclusions are to be drawn from the pedagogy of teaching sustainability. This field is important as it also might influence the effectiveness of teaching sustainability. Perhaps unsurprisingly, studies have highlighted the benefits of experiential learning and combining cognitive, emotional and spiritual approaches, and future research should be directed towards an understanding of how pedagogy can influence effectiveness. Of greater interest are the works that indicate that the complex nature of sustainability may lead to student confusion. This leads to the next area of research, which is connected to this issue.

Researchers are investigating whether class composition and inter-, multi-, intra, or transdisciplinary courses of sustainability have an impact on students' acceptance of sustainability. They focus on how sustainability issues are discussed within disciplines such as marketing, finance or human resource management, as well as the question of whether it is better to create stand-alone courses focusing on sustainability or to include sustainability in those subjects.

### **Research Proposition 1**

Stand-alone sustainability courses, whether intra-, multi-, or interdisciplinary, are easier to implement into curricula as opposed to integrating the concept of sustainability into the entire curriculum. They do not require a joint and coordinated approach of the whole teaching faculty. The advantage of a course focussing exclusively on sustainability is that students are able to look at the topic from a holistic perspective and understand how the issues involved are interrelated. The disadvantage of that approach is that students might understand sustainability as an exception rather than the rule if it appears to be in conflict with the content and aims of other courses that focus strongly, if not exclusively, on profit maximization, shareholder value and such like.

### **Research Proposition 2**

Integrating sustainability issues into existing courses where appropriate is more difficult to implement as this approach requires first sensitizing the teaching faculty. One advantage, however, is that students might understand that adopting sustainability practices is a necessity for modern businesses rather than an option.

A disadvantage of this approach might be that students may focus on single issues related to sustainability such as issues of measurability in accounting, consumer behaviour in marketing or employee well-being in HRM, and will not see the holistic nature of the topic.

### **Research Proposition 3**

Little is known about multidisciplinary courses in sustainability. It can be argued that stand-alone sustainability courses in business are multidisciplinary by nature because every sustainability issue

more or less is related to a business function. To address economic issues of sustainability, we need to look what it means for finance, marketing or accounting. New ways of teaching sustainability are needed, primarily because different disciplines place unequal weight on the subject, e.g. related concepts were found to be more frequently discussed in management and marketing courses than finance and accounting classes. Therefore, students may have different levels of expertise on the subject depending on their major, which makes teaching in general more difficult.

#### **Research Proposition 4**

Interdisciplinary courses bring together several fields such as business, engineering and architecture. What is true for multidisciplinary courses should also be true for interdisciplinary courses. Teaching an interdisciplinary course in sustainability might suffer from students having different levels of expertise in the subject. Students of business may be experts in business-related fields, while discussions, assignments and presentations related, for instance, to renewable energy may be hard to follow or, conversely, may be too basic for students of engineering.

#### **Methodology**

This paper uses a multi-methodological approach (Saunders *et al.*, 2012, pp. 128–129). Based on research propositions derived from literature, a discussion will follow using qualitative and quantitative data from five consecutive interdisciplinary sustainability courses. Research propositions are appropriate when no testable, measurable and falsifiable hypotheses can yet be made. Propositions deal with pure concepts; they rely heavily on prior research, reasonable assumptions and existing correlative evidence. Propositions are used to spur further research in the hope that further evidence or experimental methods will be discovered that will make it a testable hypothesis. When the situation is complex, propositions can serve an important role in the scientific process by suggesting a link between two concepts. A scientific proposition can suggest promising areas of inquiry for researchers (Bailey, 1994, pp. 42–44; Bhattacharjee, 2012, p. 13).

This research uses a combination of qualitative and quantitative data. The quantitative data comes from secondary sources, namely course evaluations provided by EVAS, the university's course evaluation system. The secondary data used was collected for other purposes than the research question at hand. It has been chosen for methodological reasons as it provides opportunities for replication and the collection of longitudinal data. One disadvantage is that the data does not perfectly match the research question and proposition (Frankfort-Nachmias and Nachmias, 1996, pp. 306–308).

Analysis of the data has been complemented by exploratory in-depth interviews with four students to gain some deeper insight and understanding of the general attitude of students towards the topic of sustainability. An in-depth interview is an "unstructured, direct, personal interview in which a single respondent is questioned and probed by an experienced interviewer to uncover underlying motivations, beliefs, attitudes and feelings on a topic" (Malhotra and Birks, 2007, p. 207).

The purpose of the exploratory interviews was to comprehensively understand students' knowledge and attitude of the topic prior to the course, the extent to which the course may have influenced students' attitudes, which of the course elements had the most impact on their learning and, finally, how important they felt that the topic will be in their future careers and how it should be implemented in curricula (Bridges and Wilhelm, 2008).

A regular evaluation of courses by interviewing the students with the help of standardized questionnaires has been established at the university since the 2006/2007 winter semester. The questionnaire is based on the "Guidelines for evaluation and quality development in teaching and learning" (AStA, 2007). The overall intention is that lecturers and students should discuss and understand didactic intentions and make suggestions in order to improve the courses. The results of the evaluation are only passed on to the lecturers teaching the courses. Other parties, including the deans of the faculties, receive aggregated reports only.

Courses are evaluated on a rolling basis, meaning that not every course is evaluated each semester in order to avoid an overabundance of surveys. Exceptions are *studium generale* courses which are evaluated each semester. Evaluation forms are paper- and pencil-based; they are filled out during lectures, collected by a student and placed in a sealed envelope into mailboxes that are set up at



several locations on campus. The forms are analysed, charted and posted to the lecturers by the quality management department within one day.

The questionnaire uses a 5-point Likert scale and encompasses twenty-three questions categorized into six areas ranging from demographics, course content, organization, requirements and competencies trained. At the end, open questions enable students to make comments in their own words. Three of the closed questions were useful in assessing the effectiveness of the sustainability course: (1) I was able to acquire competencies that are important for my future occupational area. (2) Competencies extended in the area of reflection: - Challenging theories, methods, paradigm, patterns of interpretation - Dealing with the consequences of own professional occupation and the consequences of society - Transfer of reflection results into personal behaviour and actions, and (3) Would you recommend this course to others?

### **The Sustainability Module within the *Studium Generale***

The Sustainability module is an elective within the *studium generale* at the Frankfurt University of Applied Science. As of 2006/2007 the *studium generale* has been an integral part of the university's newly developed concept for the transmission of interdisciplinary key competencies (Geldsetzer, 2008), i.e. it refers to capabilities that are not related to any specific discipline but that are still needed by people with specialist degrees and qualifications. The *studium generale* module is a compulsory module for all bachelor programs at the Frankfurt University of Applied Science.

Students of all four faculties of the university, i.e.:

- Architecture, Civil Engineering, and Geomatics
- Computer Science and Engineering
- Business and Law
- Health and Social Work

jointly participate in one of the *studium generale* modules to contribute to the interdisciplinary approach. Apart from Sustainability, other electives include Globalization, Crisis Management, Mobility, Media Production, Quality Management, and Peer Mentoring.

The Sustainability module started in the 2011 winter semester and is taught by three to four professors, one from each of the faculties. The course content deals with sustainable buildings, renewable energy, corporate and marketing sustainability, measuring sustainability and personal health management. The core objectives of the course were defined as:

- "[to] understand why the legacies of the twentieth century have created challenges for society, e.g. in the field of (1) urban and regional planning and the disciplines of architecture, (2) industrial production, the supply of energy and natural resources (3) business and economic development (4) consumption, and (5) health.

- [to] analyse the influence people can exercise as citizens, e.g. in their role as employees or consumers, to emphasize sustainability and how stakeholders in companies, scientists and engineers meet the challenge of emerging concerns about sustainability." (Module Handbook)

In addition to the overall goals of the *studium generale*, the Sustainability course encourages students to be more sensitive to sustainability issues, both in their private and professional lives.

During the accompanying lecture series the instructors give presentations related to the topic within their area of expertise. Students choose from a list of team projects that focus on selected problems and require them to develop sustainable solutions to these problems within their teams. A portion of class time is assigned for team meetings, giving students the chance to discuss with their team and to consult with lecturers when required. Grading is based on the team project, deliverables are a team presentation in class and a written paper submitted by the end of course.

One distinctive feature of the course is the opportunity to go on field trips in which the classes visit companies in the region of Frankfurt and discuss the company's sustainability approach and projects with managers. Past field trip destinations have included Deutsche Bank (Green Towers), KfW Bank, a

Biogas Plant, EVO AG (Smart Home), Fraport AG (new runway and noise reduction), Commerzbank (hanging gardens), JUWI (solar- and windparks) and the Solar Decathlon project about building sustainable student houses. Upon completion of the module students receive 5 ECTS.<sup>1</sup>

Following the results from Erskine and Martin (2012), the most effective learning approaches employed are:

- Field trips away from campus to learn about sustainability
- Guest speakers
- Invited lectures by experts in sustainability
- Case studies in classes about sustainability issues
- Student team projects related to sustainability

## **Findings and Results**

### **Course Evaluation**

Course assessments based on student evaluations are measured by the university's evaluation system, EVAS, using a standardized questionnaire with a 5-point Likert scale. The questions were modified in the 2012 winter semester to better reflect the interdisciplinary approach of the *studium generale*. The table below shows the course evaluation over three semesters with regard to three items that are suitable to measure the impact that the course might have had on students' understanding and assessment of the importance of sustainability for their future careers.

Groups were comprised of no more than forty students; in the evaluated semesters there were no more than thirty-two students registered for the course. The exact number is unknown because a few students decided to withdraw from the course without giving notice. For all three semesters, sixteen to seventeen students evaluated the course which is a response rate of about fifty percent.

<b>I was able to acquire competencies that are important for my future occupational area</b>			
	<b>WS 12</b>	<b>SS13</b>	<b>WS13</b>
Mean	2,9	3,0	3,2
Standard dev.	1,4	1,3	1,4
n	16	17	17
<b>Looking back in which spheres of competence have you extended you knowledge ?</b>			
<b>- - In the area of reflection</b> (multiple answers possible):			
Challenging theories, methods, paradigm, patterns of interpretation	25,0%	27,8%	52,9%
Dealing with the consequences of own professional occupation and the consequences of society	25,0%	22,2%	23,5%
Transfer of reflection results into personal behaviour and actions	31,3%	22,2%	23,5%
Total	81,3%	72,2%	99,9%
No Answer	18,7%	27,8%	0,1%
n	16	17	17
<b>Would you recommend this course to others?</b>			
Mean	3,1	3,3	3,7
Standard dev.	1,3	1,2	1,3
n	14	17	17

Table: Course Evaluation

Asked for their opinion of whether they were able to acquire competencies that are important for their future careers, over the three semesters the students' evaluation as a mean were 2.9, 3.0 and 3.2, respectively. The standard deviation shows that there is some variation with the students' evaluation.

<sup>1</sup> European Credit Transfer Points

Some rated the competencies acquired more positively than others. It should be noted that the general evaluation slightly improved each semester. A possible explanation for this is that the lecturers became better at adapting their teaching approach to students' level of expertise or expectations over time. The students' evaluation of whether they would recommend the course to others followed the same pattern.

The student evaluation in the area of reflection asked them to identify whether they had a chance to reflect in three areas. The overall results suggest that roughly one quarter of the students saw the chance for reflection, with the exception of the last semester. About half of the students indicated that they challenged theories, paradigm methods and patterns of interpretation.

Because the standardized questionnaire does not offer a chance of understanding students' reasoning or gaining deeper insight into their motives or answers, qualitative interviews with students have been conducted.

### **Qualitative interviews with students**

Using a semi-standardized questionnaire, qualitative interviews were conducted with students of the Sustainability module. The interviews were conducted after the examination period and after the course grades were publicized to avoid the possibility of students' answers being influenced by a wish to obtain more favourable grades by giving responses that they perceived to be expected by lecturers. The discussion ranged from conversations about what they understood of the concept of sustainability before taking the course, whether they had already talked about sustainability in other classes, what they were taking away from the course and how they think that sustainability should be implemented into curricula.

The answers displayed the diverse nature of students' experiences and understandings about the module. While some students declared that they were interested in the topic before the course and therefore already had a certain level of understanding, others stated that they had little knowledge about sustainability prior to the course. Students who had already heard of or discussed sustainability before explained that they had a previous class or that they had a personal interest. Typical statements were:

*"I generally have an ecological world view." "I think green and therefore I already knew a lot about what we were talking about in class." "We talked about sustainability in other classes before, although not as comprehensively, but most concepts we talked about were also very basic."*

Other students declared that the sustainability was quite a new concept to them and that, if they talked about sustainability at all in other classes, the focus was rather on cost savings and reducing emissions. These students were surprised about the comprehensiveness of the sustainability concept.

*"Sustainability issues were addressed only in the context of cost efficiency." "From our team project I was surprised to learn that CO2 emissions can be decreased by city planning and construction"*

Students agreed that sustainability will play an important role in their future careers. They disagreed, however, on how much the course was able to contribute to their level of expertise as this depended on their previous knowledge.

### **Discussion and Conclusion**

This paper contributes to the body of literature on teaching sustainability in business schools. Previous works in this area were presented in terms of teaching approaches, curriculum integration, and inter-, multi-, and transdisciplinary groups.

Regarding the first research proposition, our experience shows that stand-alone courses are easier to establish, in particular as an elective course.

The results show that interdisciplinary approaches may suffer from the additional effort they require from students to learn about other disciplines. Within disciplines, sustainability requires an already substantial understanding of marketing, finance, HRM and so on in order to capture the complex

subject of sustainability. If students are forced to acquaint themselves with knowledge from other disciplines such as computer science, architecture or engineering, the bar may be set too high.

In addition, the research supports previous findings that the role of teaching sustainability issues in business schools is relatively new and the inclusion of sustainability theories and concepts in courses or curricula has to be increased. These findings are consistent with Erskine and Johnson (2012), who found that sustainability integrated into various classes is considered to be more effective (mean=3,89, on a 5-point Likert scale with a SD= 0,85) than an elective course in sustainability offered to students (mean: 3.58).

The survey instrument developed by Thomas (2005) is helpful to better understand the effectiveness of sustainability courses. These questions might be supplementary to the regular evaluation questionnaire and may be seen as an additional burden by students.

### **Limitations**

One limitation of this paper is that the data analysed is from a sustainability course at one university over a period of three semesters. Although the course was run over five semesters, the evaluation data was only available for the last three semesters due to a revised survey instrument. The total sample from three consecutive courses comprised 50 student evaluations. The total number of students that took the course in that period was about 100. The response rate to the questionnaire was 50%, which is satisfactory. The questions are standardized but were designed for another purpose, namely the quality improvement of lectures in general, and not to understand the effectiveness of an interdisciplinary course in sustainability. The accompanying qualitative interviews were partly conducted in order to overcome these limitations. In addition, the overall population was defined as students at the university taking the Sustainability module. Therefore, no conclusion can be drawn from the results as to how a similar course would work at other universities, nor how a differently designed course would work at the same institution.

### **Implications and Future Research**

The study will be repeated in order to collect longitudinal data. Longitudinal data will help to understand whether the inclusion on sustainability issues at the university will increase and whether student's appreciation of the course will improve.

Research proposition two, whether integrating sustainability issues into existing courses is more difficult to implement, because it requires first sensitizing the teaching faculty, is an interesting area for future research. Understanding how many lecturers are already including sustainability into their discourses and if they do, do they present it as an option to save cost or as a necessity for modern businesses, will help to understand why of why not student are buying into the concept of sustainability. More research is needed here.

Research proposition three, which deals with the question, if a course in sustainability will be more effective when taught multidisciplinary is another thought-provoking area for future research. When sustainability is well integrated into all functions and disciplines, multidisciplinary courses, either mandatory or elective, may become obsolete.

From this research, recommendations for both higher education institutions on how to implement sustainability in courses and curricula as well as for companies to follow up with further training initiatives for their junior managers can be given.

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