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Hesselbarth, Charlotte; Schaltegger, Stefan

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Educating Change Agents for Sustainability

Learnings from CSM's MBA in Sustainability Management

Charlotte Hesselbarth and
Stefan Schaltegger

Centre for Sustainability Management (CSM)
Leuphana Universität Lüneburg
Scharnhorststr. 1
D-21335 Lüneburg

Fax: +49-4131-677-2186
csm@uni.leuphana.de
www.leuphana.de/csm/

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Centre for Sustainability Management (CSM)
Leuphana University of Lueneburg
Scharnhorststr. 1
D-21335 Lueneburg

Centrum für Nachhaltigkeitsmanagement (CNM)
Leuphana Universität Lüneburg
Scharnhorststr. 1
D-21335 Lüneburg

Tel. +49-4131-677-2181
Fax. +49-4131-677-2186
E-Mail: csm@uni.leuphana.de
www.leuphana.de/csm

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ABSTRACT

In recent years knowledge and capabilities to manage corporate sustainability have become a significant component of different career paths in companies, consultancies, and even in NGOs and public institutions. As an answer to this worldwide trend of a new profession ever more universities and business schools have taken the initiative to increase their teaching activities in CSR and sustainability management. As most courses do not have a long track record and as only a limited number of management-oriented continuous education studies exists so far we still know little about how managers could be educated most effectively to become change agents for corporate sustainability. This paper examines a case study and provides insight into ten years of MBA education for sustainability management at CSM, Leuphana University Lueneburg, Germany. Based on data from a recent alumni survey we analyze the corporate practice experiences of the first 85 successful MBAs students and the medium term effects of one of the first MBA programs in sustainability management. Based on the analysis we propose a competence matrix to structure basic components of postgraduate education in sustainability management. The paper makes a contribution in showing that extant research needs to be expanded with regard to the practical experiences graduated MBA students make when applying the knowledge acquired in their studies and in discussing curriculum development concerning course contents and the didactical approach.

1. INTRODUCTION

In recent years knowledge and capabilities to manage corporate sustainability has become an ever more significant component of different career paths: In addition to a growing demand from companies which are considered to be sustainability pioneers we observe an increasing interest in sustainability management experts from consultancies, financial service providers, NGOs, public institutions and multinational companies, most of them not having established a strong sustainability agenda so far.

As an answer to this worldwide trend of a “flourishing profession” (Visser and Crane 2010, 4) ever more universities and business schools have taken the initiative to increase their research and teaching activities in CSR and sustainability management for the last few years (Matten and Moon 2004, 326; Wu et al. 2010). As most courses do not have a long track record and as only a limited number of management-oriented part-time studies exists so far (Grothe and Fröbel 2010) we still know little about how managers could be educated most effectively to become change agents of corporate sustainability. This is why one of the first MBA programs which is completely focused on sustainability management and the results from an alumni survey of the first hundred successful students are examined as case in point with regard to the study program, teaching contents, didactical approach and job profiles. The analysis is conducted in the view of the vision of educating ‘change agents for sustainability’.

This paper provides insight into ten years of MBA education for sustainability management of the Centre for Sustainability Management at Leuphana University Lueneburg, Germany. We analyze empirically the medium term effects of one of the first MBA programs in sustainability management on the basis of the corporate practice experiences of the first 85 successful MBAs students: Have the students been enabled to cope with the multi-faceted sustainability challenges in corporate practice? Did they receive the right kind of knowledge, skills and motivation which practitioners need to make a difference in the world and move organizations and society towards more sustainability? Based on these experiences, which conclusions can be drawn for a conceptual framework, curricula and teaching methods to successfully educate future change agents for sustainability?

With this paper we aim at intensifying the exchange of experiences within the community of business schools which offer sustainability management education and provide some answers to key issues in the context of higher education for sustainability (Starik et al. 2010, 381). Based on a discussion of the aims and the conceptual framework of the MBA Sustainability Management we present empirical findings from a recent alumni survey. Requirements of a new occupational field are analyzed as well as the motivation and career paths of sustainability managers, learner-friendly conditions and appropriate teaching methods for professional students in a blended learning concept.

The paper contributes to research in two ways: First, we propose a competence profile of a change agent for corporate sustainability. Based on a literature review and empirical findings from analyzing alumni survey data of the MBA Sustainability Management we suggest a competence matrix to structure basic components of higher education in sustainability management. Second, we discuss what can be concluded from the competence profile of a

sustainability manager and the practical experiences of MBA graduates with respect to curriculum development, course content and the didactical approach.

2. LITERATURE REVIEW

The need for including sustainability in professional practices (e.g. Boyle 1999) and the central role of universities in educating responsible leaders (e.g. Osiemo 2012; Raivio 2011) and for the transition to sustainable societies (e.g. Corcoran and Wals 2004; Fadeeva and Mochizuki 2010; Ferrer-Balas et al. 2010; Hansen and Lehmann 2006; McNamara 2010; Palma et al. 2011; UNESCO 2009) have been emphasized in an extant body of literature (see also Lozano-Garcia et al. 2006). Furthermore, the influential role of companies in the economy and society as well as for sustainable development (e.g. Schaltegger and Burritt 2005) raise the question of how sustainability and CSR are considered in management education, particularly in qualified practice-oriented higher management education which addresses middle and top management.

Prior research has examined sustainability and CSR in existing curricula and for curriculum development for undergraduate and bachelor (e.g. Jones et al. 2008; Lambrechts et al. 2012), graduate, master, and PhD-programs (e.g. Bergeå et al. 2006; for off-campus PhD programs Baas et al. 2000) as well as postgraduate and tertiary education (e.g. Naeem and Peach 2011; Thomas 2004).

Whereas some authors have investigated sustainability specific courses and programs (for a new business course e.g. Marshall and Harry 2005; for eco-design in a doctoral program, see Bergeå et al. 2006) others dealt with the integration of sustainability into existing curricula (e.g. Bacon et al. 2011; Fredriksson and Persson 2011; Vezzoli 2003), regular courses (e.g. Boks and Diehl 2006) and the curricula of a choice of universities (e.g. Savelyeva and McKenna 2011). Lozano (2010) developed a tool to measure the integration and diffusion of sustainable development contents in the course curricula of a university.

In depth studies dealing with the integration of sustainability into curricula and the education of educators in cleaner production have been particularly conducted for engineering and broad interdisciplinary environmental programs (e.g. Boks and Diehl 2006; Huisingh and Mebratu 2000; Juárez-Nájera et al. 2006; Kamp 2006; Segalas et al. 2010). Stubbs and Schapper (2011) discuss two approaches to management curriculum development and Rusinko (2010) proposes a matrix approach to integrating sustainability in business education.

More specifically, environmental topics important for CSR and corporate sustainability like cleaner production, energy efficiency, eco-design and design for the environment have been examined with regard to their integration into the curriculum. For example, Bergeå et al. (2006) investigate eco-design in PhD doctoral education, Vezzoli (2003) sustainable design in a polytechnic university, Fredriksson and Persson (2011) the integration of sustainability into operations management courses, Eagan and Streckewald (1997) the development of a short business course on design for the environment, and Desha and Hargroves (2010) the state of higher education in energy efficiency in Australian engineering curricula.

Further topics of sustainability oriented higher management education and educating responsible leaders of organizations include (e.g. Osiemo 2012; Hazen et al. 2004; Shephard 2008) topics of sustainable development, corporate sustainability, social responsibility, leadership, sustainable entrepreneurship, intertwining of teaching and research (i.e. research not just as a library experience) as well as soft-skill related

approaches such as targeting affective learning outcomes, service learning, establishing a mentorship program, teaching with a sustainability mission of personal development and team building.

More specifically, the question what kind of competencies sustainability education should produce has become a core area of the education for sustainable development research (e.g. Barth et al. 2007; de Haan 2006; Fadeeva and Mochizuki 2010; Mochizuki and Fadeeva 2010; Parker 2010; Rieckmann 2012; Wals and Jickling 2002). We will deal with this topic in more detail in Section 3.

The question of what didactical methods are particularly apt for sustainability and sustainable business courses and programs has been researched for a variety of approaches such as active learning (MacVaugh and Norton 2012); action research as an approach to integrating sustainability into an MBA program (Benn and Dunphy 2009), student praxis projects (e.g. Bacon et al. 2011; Rosenbloom and Cortes 2008), collaborative concept maps to learn how theory can become practice (Miranda Correia and Infante-Malachias 2010), affective learning (Shephard 2008), transformative learning experiences (e.g. Bergeå et al. 2006), the consideration of boundary objects (Benn and Martin 2010), real world learning experiences (Brundiers et al. 2010; Steiner and Posch 2006), transdisciplinarity in sustainability education (e.g. Brundiers et al. 2010; Clark and Button 2011; Steiner and Posch 2006), courses in collaboration with companies (e.g. Eagan and Streckewald 1997) and e-learning (Oprean et al. 2011).

To create a good general learning environment for the understanding of sustainability problems and to enable students to better address sustainability, a change of academic and professional culture has been proposed (e.g. Juárez-Nájera et al. 2006) and “new integrative, inter- and transdisciplinary epistemological approach” has been called for to create a “holistic perspective into a traditional undergraduate curriculum, which aims at specialization” (Miranda Correia and Infante-Malachias 2010, 678).

The literature also discusses accompanying and supporting factors of integrating sustainability into the educational agenda and curriculum. These include developing and communicating a sustainability mission of the university (Djordjevic and Cotton 2011; Osiemo 2012), university declarations for sustainable development (Lozano et al. 2011), and a sustainable campus development (e.g. Kurland 2011; Mitchell 2011), including operational management issues like transport, purchasing, energy and waste management as important aspects which provide room for sustainability related experiences and credibility (e.g. Atherton and Giurco 2011; Brinkhurst et al. 2011; Djordjevic and Cotton 2011; Thurston and Eckelman 2011). McNamara (2010), Nomura and Abe (2010), Pesonen (2003), Springett and Kearins (2001) and Thomas (2004) analyzed institutional and systemic barriers to the integration of sustainability in higher education and approaches how to overcome them.

Another stream of research examines the role of academic staff development as a catalyst to curriculum development (Barth and Rieckmann 2012; Ferrer-Balas et al. 2010; Huisingh and Mebratu 2000; Stir 2006; Stubbs and Schapper 2011).

As part of the overall development of higher sustainability education, it has been called for more integration of sustainability and CSR in management and business education (e.g.

Matten and Crane 2004; Sherman and Hansen 2010; Springett and Kearins 2001). Particularly for management programs, research has examined case studies for bachelor programs (e.g. Lambrechts et al. 2012) and didactical approaches to bridge the academia-practitioner gap such as active learning (MacVaugh and Norton 2012).

Matten and Crane's (2004) overview of corporate sustainability and CSR education at university business schools in Europe shows for the MBA programs that 12% of the schools have dedicated CSR offers and 32% have optional courses as part of the MBA program. The authors state, however, that CSR may be over-represented in these figures as half of the respondents were taken from a CSR researchers and teachers database (Matten and Crane 2004, 328). More recently some conventional MBA programs have introduced an MBA Oath (e.g. Anderson and Escher 2010; Boyle 2011) which addresses social responsibility. Although an oath may raise awareness for responsibility in general such a measure cannot be seriously seen as an integration of sustainability topics into the curriculum. Reviewing the currently offered MBA programs furthermore shows that many programs which consider themselves dedicated to CSR offer specific compulsory sustainability modules or are focused on ethics but do not necessarily integrate sustainability throughout all MBA modules.

Surveys for the Financial Times top 50 business schools (Christensen et al. 2007), Canada (Beringer et al. 2008), the South Pacific region (Corcoran and Koshy 2010) and the Asia-Pacific region (Ryan et al. 2010; Naeem and Neal 2012) provide similar results. An emphasis on ethics as part of the studies has been identified in the Asia-Pacific programs for which sustainability has been mentioned as an integral part of one or more courses. The overall picture shows that business schools are not (yet) integrating sustainability on a large scale. "Only one of the business schools out of the whole 48 surveyed [in the Asia Pacific region] was offering a full degree program in a sustainability-related subject" (Naeem and Neal 2012, 65). Although already in 2004, overall "healthy enrolments" (Matten and Crane 2004, 328) were identified for executive and MBA courses with CSR dedication, MBA programs which fully integrated corporate sustainability and sustainability management are still an exception (for such an exception of an innovative MBA specializing in sustainable development in Malaysia see e.g. Amran et al. 2010). "As a result many universities are still lagging behind companies in helping societies become more sustainable" (Lozano et al. 2011).

Observing the development of these different streams of literature raises the question how MBA students who have successfully finished their studies in corporate sustainability and CSR management assess the usefulness of the course contents, the didactical approaches, the general learning environment the university and the program provides, and the course intensities. Apart from investigating the experiences of environmental practitioners (Bootsma and Vermeulen 2011), industry's needs for environmental training (Venselaar 1995) and a competency survey report of sustainability professionals (Willard et al. 2010) little is known how practitioners who have been educated in a specific higher sustainability management program assess the usefulness of their sustainability studies.

3. COMPETENCIES OF CORPORATE CHANGE AGENTS FOR SUSTAINABILITY

Companies have traditionally operated in an unsustainable manner, using non-renewable resources, causing pollution, creating disposable products and waste, etc. The task of sustainability management is thus to change strategy, operations, products, etc. to more sustainable forms of economic value creation. This is why a program for higher management education should enable managers to organize change processes, i.e. the education is challenged to support actors to become change agents for sustainability.

3.1 Defining a corporate change agent for sustainability

A possible ultimate educational objective of a program for higher management qualification in sustainability management can be defined to qualify corporate change agents for sustainability. This objective is rooted in the multi-faceted general literature on the role of individuals as change agents. A change agent can be considered as an "internal and external individual (…) responsible for initiating, sponsoring, directing, managing or implementing a specific change initiative, project or complete change programme" (Caldwell 2003, 139–140).

Change agents are opinion leaders and driving forces in change processes. They convince superiors, form coalitions, allay fears as well as motivate and inspire employees and teams to leave old paths and take responsibility for social and environmental issues (Buchanan and Boddy 1992; Kanter 2000; Rogers 2003; Tichy 1974). Typically, change agents incorporate multiple roles of a manager, consultant, leader, expert, team player, catalyst, promoter and entrepreneur (Caldwell 2003, 140 for a classification of change agency models).

In the specific context of sustainability management this general definition can be adapted: A change agent for sustainability is an actor who deliberately tackles social and ecological problems with entrepreneurial means to put sustainability management into organizational practice and to contribute to a sustainable development of the economy and society. In particular these change agents develop sustainability as a factor of success in their working environment, integrate sustainability criteria into business processes and organizational structures, initiate sustainability-related projects which enact substantial change in the organization and beyond, and who transfer the vision of sustainable development through cooperation and public relations to a wider group of the society. As Visser and Crane (2010) point out, multiple roles such as sustainability expert, facilitator, catalyst and activist are part of being a change agent for sustainability. Change agents for sustainability are not necessarily senior managers but can be individuals on all levels internal or external of an organization. The definition of a change agent for sustainability thus also includes those who successfully initiate and promote change toward sustainable development on a lower hierarchy level and without a specific mandate.

3.2 Competencies of a change agent for sustainability

Competence-oriented educational concepts focus on the ‘output’ of educational processes whereas conventional didactical approaches focus on ‘input’ (contents and subjects) which students should learn. The output approach does not ask what should be taught, but what should be learnt: What kind of managing abilities, which analytical concepts and problem-solving strategies should students have acquired as a result of the learning process?

We refer to the common elements typically mentioned in definitions of competency (e.g. Baartman et al. 2007; Rychen and Salganik 2003; Weinert 2001). Apart from a broad foundation of disciplinary and interdisciplinary knowledge also cognitive and practical skills as well as attitudes and capabilities to successfully perform complex tasks in real life work environments are emphasized together with the ability to cooperate and motivate.

The question what kind of competencies sustainability education should foster has become a core topic in sustainability education research (e.g. Barth et al. 2007; de Haan 2006; Mochizuki and Fadeeva 2010; Rieckmann 2012; Wiek et al. 2011). Reviewing this literature reveals an increasing convergence about the critical role of key competencies (Baartmann et al 2007; Sipos et al. 2008; Segalas et al. 2010; Willard et al. 2010; Wiek et al. 2011 for an integrative framework). For higher education for sustainable development the commonly mentioned competencies have been specified and broadened to include skills, motivations and affective dispositions for the successful solving of real-world sustainability problems and the identification and realization of opportunities. Key competencies are described as multifunctional and context-independent and important for all individuals and particularly relevant to achieve the objective of sustainable development (Riekmann 2012). Table 1 provides a selection of literature marking the debate to define (key) competencies in sustainability education.

In spite of the convergence no common agreement exists about the “right” approach to select, define and rank key competencies required for sustainable development (Fadeeva and Mochizuki 2010; Rieckmann 2012; Rychen and Salganik 2003). Each of the approaches aggregates and emphasizes different aspects of an overall educational objective – to enable individuals to participate in socio-political processes and move the society towards sustainable development (de Haan 2006; Hopkins and McKewon 2002). Recent studies (Rieckmann 2012; Wiek et al. 2011) highlight that systemic, anticipatory, strategic and critical thinking accompanied by normative and interpersonal competencies are most crucial for higher education for sustainable development.

Table 1: Key competencies in sustainability education

UNESCO (Delors 1996)	4 pillars of education for the 21st century: • Learning to know • Learning to do • Learning to be • Learning to live together
OECD (2005)	• key competencies for the interactive use of tools, such as knowledge, media and resources • the competencies for acting autonomously • competencies for interacting within socially heterogeneous groups.
De Haan (2006); see also Rieckmann (2012)	Shaping competence comprising the following key competencies: • Competency in anticipatory thinking • Competency in interdisciplinary work • Competency in cosmopolitan perception and change of perspectives • Competency in handling incomplete and complex information • Participatory Competency • Competency in cooperation • Competency in dealing with individual decision dilemmas • Competency in self-motivation and motivating others • Competency in reflection on individual and cultural models • Competency in ethical action • Capacity for empathy and solidarity
Sterling and Thomas (2006)	Values, knowing, skills and understanding: • Competency to value diversity, environment and justice • Knowledge of the principles of sustainable development • Systemic thinking and analysis • Knowledge of sustainability issues and problems • Competency to work across disciplines • Cooperative action and conflict resolution • Competency to deal with uncertainty • Competency to take action to bring change
Roorda (2010)	• Responsibility • Emotional intelligence • System orientation • Future orientation • Personal involvement • Action skills
Wiek et al. 2011	• Systems-thinking competence • Anticipatory competence • Normative competence • Strategic competence • Interpersonal competence

The question of what competencies education for sustainability management should consider has also been addressed recently (Lozano et al. 2011; Rands 2009; Shephard 2008; Stubbs and Schapper 2011) and agreement seems to exist that knowledge, skills and attitudes are three crucial components. With regard to knowledge various authors emphasize the importance of knowledge about ecological concepts, environmental management systems and practices, specific approaches to nature and sustainability, and concepts of social global justice (Benn and Dunphy 2009; Rands 2009; Waddock 2007). Several scholars point out the need to include the development of advanced communication, negotiation, critical analysis and change management skills into postgraduate studies (Hind et al. 2009; Juárez-Nájera et

al. 2006; Shepard 2008). With respect to attitudes, as the third highlighted component in management education for sustainability, research emphasizes the importance to encourage students to question their view of the world and to develop reflective thinking and their own understanding of complex and challenging issues (Rands 2009; Shephard 2008).

Although the mandate of sustainability education to contribute to transforming unsustainable structures, processes and behavioral patterns into sustainable ones is commonly mentioned, the competence profile of a change agent for sustainability is not in the center of the debate. Revealing the literature shows that the outcome-oriented research on competencies of graduate sustainability management studies and postgraduate MBA programs is still in an early stage of development. The growing body of theoretical literature on management education for sustainability mainly discusses the integration of sustainability into mainstream management curricula (Benn and Dunphy 2009; Rands 2009; Rusinko 2010), selected interdisciplinary competencies (e.g. Parker 2010), 'reflexive abilities' (e.g. Hind et al. 2009; Fadeeva and Mochizuki 2010; Mochizuki and Fadeeva 2010; Wals and Jickling 2002) and environmental aspects (e.g. Bootsma and Vermeulen 2011; Rands 2009). A comprehensive survey which provides an overview of competencies of sustainability managers in corporate practice was conducted by Willard et al. (2010). Svanström et al. (2008) examine the activities of the US initiative ACPA (American College Personnel Association) which defines a set of 44 abilities and traits of change agents who engage in creating a sustainable future. Whereas the study of Willard et al. (2010) deals with corporate practice but does not discuss curriculum consequences, the rather comprehensive compilation of ACPA does neither refer to management and MBA education nor to the real-world requirements of sustainability professionals.

Reviewing the literature on sustainability competencies for organizational and corporate change agents reveals a need to further explore both, the competencies required to be successful in corporate practice, and the consequences which can be drawn for postgraduate management education to help student develop the needed competence profile of a change agent for sustainability. These competences include the key competencies considered essential for sustainability education in general and the more detailed set of subject-specific, methodological, social, and personal competencies (see Heyse and Erpenbeck 1999 for this often used classification of competencies) of sustainability management.

Focusing on the specific competence profile of a change agent for sustainability raises the question of what set of knowledge, skills and attitudes postgraduate students need to develop to master all tasks of a sustainability manager and to successfully contribute to sustainable development of corporations and society. To examine the questions what competencies postgraduate students have gained through their MBA studies and what competencies and topics have been considered to be particularly useful, less important or missing in the practical work of the sustainability professionals we analyzed the alumni survey results of CSM's MBA program at Leuphana University which is shortly described in the following.

3.3 CSM's MBA approach in sustainability management

The MBA Sustainability Management of the Centre for Sustainability Management (CSM) at Leuphana University in Lueneburg enrolled the first students in 2003 in response to an increasingly perceived lack of systematically qualified sustainability management experts. As one of the worldwide first MBAs in this area the program deals with a broad set of sustainability topics from a management perspective and aspires to support sustainable development through educating change agents in business and society. The ultimate educational goal of a change agent for sustainability refers to individual, organizational and societal objectives. On the individual level the study program aims at the personal development and the enhancement of future-oriented knowledge and learning competencies of students to qualify them for management positions. On the organizational level improved management competency shall lead to increasing competitiveness of more sustainable companies and their capacity to contribute to societal objectives of a sustainable development through higher corporate sustainability performance.

The two-year continuous education program is designed with a modern blended learning approach, combining e-learning with company-internal workshops and on-campus seminars, where students experience a 'sustainable university' in Lueneburg.

In addition to compulsory modules elective modules offer the opportunity to specialize according to occupational requirements and individual preferences. Particular priority is given to the development of methodological, social and personal competencies (generic competencies) – soft skills courses sum up to one third of the content. Figure 1 provides an overview of the MBA curriculum.

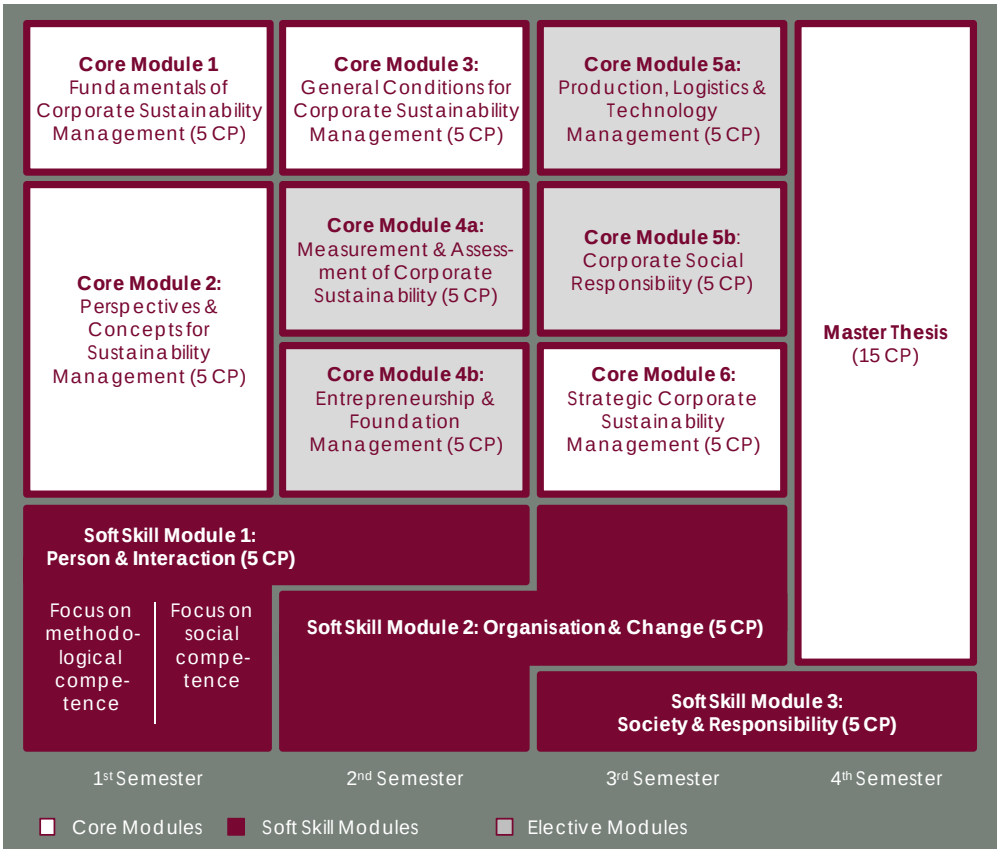

Figure 1: Curriculum of the MBA Sustainability Management

The curriculum is organized in six core modules, three soft skill modules and a master thesis dealing with a sustainability management problem of practical interest. Each accomplished module earns five credit points and the thesis 15 of 60 credit points in total for the whole program.

The core modules systematically discuss strategic management, methods and tools of sustainability management in combination with a strong emphasis on entrepreneurship and innovation management. The curriculum addresses the following occupational requirements of sustainability management:

- Measuring and assessing ecological and social aspects of corporate performance and their impact on corporate success
- Identifying market opportunities for sustainable products and services
- Coordinating intra- and inter-organizational projects, material flows and supply chain cooperation
- Organizing stakeholder-dialogues and projects to assess ecological and social problems and develop and implement solutions
- Enhancing credibility and corporate reputation with regard to truly improved sustainability performance

The MBA sustainability management has attracted people with diverse educational and occupational background who predominantly deal with sustainability in their daily work. The part time students can directly apply new skills to their job and transfer developed competencies into their professional working environment. The possibility for immediate and

continuous application and trial of new knowledge attempts to increase both the motivation of the students and their real world impact during their studies. Almost all industry sectors are represented (slightly higher proportions in recent years: consulting, financial services and energy/renewable energy), in addition to MBA students working for NGOs, development aid organizations and public institutions or as self-employed persons. About 17 % of the students are engineers and a considerable share of almost 35 % has successfully completed studies in economics or business administration before entering the program. Students without a first management degree or a qualified long-term experience in a superior management position have to complete a preparatory course on fundamentals of business management. The MBA program in sustainability management requires at least two years of professional experience. 35,3 % of the students possess less than 4 years of work experience when entering the program, but the MBA program also attracts students with a much longer working life (30 % have working experiences of more than 11 years).

In the following we analyze the competencies acquired and the praxis experiences of the first MBA students who successfully finished their studies.

4. RESEARCH QUESTION AND APPROACH

This paper investigates in the following what competencies the graduated students of the MBA Sustainability Management have gained, what competencies they consider to be particularly useful, or not so useful, for their job and what MBA practitioners missed in their higher education program.

A survey of all students who successfully completed the MBA program was conducted in autumn 2011. For consistency reasons the two classes of 42 Latin American students who studied an adapted program are not included in this study. The survey covers five cohorts of the German MBA Sustainability Management with 85 students of which a total of 68 alumni responded. The high response rate of 80 % can be considered an indication for a strong commitment to the study program and the Centre of Sustainability Management. Despite the high response rate a positive selection of responding participants in the study cannot be excluded.

The main objectives of the alumni survey were to gain information about the perceived quality of the study program, the educational output with a special focus on acquired competencies of a change agent for sustainability, and the outcome, i.e. the achieved professional success.

The alumni were invited to fill out an online questionnaire with a total of 68 questions and half an hour response time in average. We used predominantly closed questions based on a six point Likert scale to inquire the assessment of the participants with ‘1’ indicating a comprehensive acquisition of competencies (or the strongest degree of agreement with a particular statement) and ‘6’ indicating no perceived acquisition of competencies (or the strongest degree of disagreement).

5. RESULTS OF THE ALUMNI SURVEY AND DISCUSSION

In the following we first present and then analyze the results of the alumni survey with regard to the acquisition of subject specific competencies, soft skill competencies and personal development, the career paths and the requirements of the new occupational field of sustainability management.

5.1 Acquisition of subject-specific competencies

First, the alumni were asked how they perceive the level of subject-specific competencies acquired through the MBA program. The questions related to general management and business administration, fundamentals of sustainable development, and sustainability management.

For *general management* the responses indicate that only a medium level of new competencies was acquired. The perceived extent of acquired general management competencies ranges in average from 2.82 of 6 for strategic management and marketing to 4.15 for finance, whereas 1 would be a very large acquisition of comprehensive general management competencies.

This result is not surprising as about one third of the students has graduated in economics or business administration prior to the MBA and intended to learn specific knowledge in sustainability management and only update their conventional management knowledge. The results show that especially alumni without a background in management or economics acquire general management know-how. Although the alumni perceived the curriculum as well-balanced, a wider choice of elective modules in sustainable finance, logistics and sales is desired to deepen the general management knowledge.

For the *subject-specific competencies in 'fundamentals of sustainable development'* most of the respondents feel familiar with principles and fundamental concepts of sustainable development with an average assessment of 2.12 (assessment 1: 20 %, 2: 55.5 %, 3: 21.5 %).

More specifically, to increase their *subject-specific competencies in 'sustainability management'* were central to the students for their decision to enroll in this MBA program. The survey results indicate that the alumni have acquired comprehensive subject-specific competencies in most areas of sustainability management. As some competencies are more deeply addressed in elective modules the results are differentiated for participants of the respective elective module and all other students (Table 2). The students choosing the elective perceive a higher gain of competency (0.52 points in average) than the other students, which reflects the additional time and effort spent for the elective module.

Table 2: Acquisition of subject-specific competencies in 'sustainability management' (n = 67, deviations indicated)

Element of subject-specific competencies	Extent of perceived competency acquisition (1 – very comprehensive, 6 – not at all), average
Fundamentals of sustainability management	1.56
Strategic sustainability management	1.79
CSR	2.26
Sustainability marketing	2.07
Instruments of Sustainability Management	2.43
Sustainability communication and reporting	2.54
Measurement & assessment of sustainability performance	2.70 (all, n = 67) 2.28 (participants of elective module, n = 32)
Technology and innovation management	3.47 (all, n = 67) 3.16 (participants of elective module, n = 42)
Sustainable Entrepreneurship	3.47 (all, n = 67) 2.64 (participants of elective module, n = 31)

Despite this positive assessment the program directors feel a need to strengthen the students' competencies in 'fundamentals of sustainable development' and their understanding of the political and economic framework for sustainability management with expanded courses in sustainability governance. They furthermore intend to restructure the elective modules targeting subject-specific competencies in 'sustainability management' by integrating aspects of sustainability performance measurement and communication in an overarching information management module and therefore improve the competency acquisition through more lateral interdisciplinary thinking in these management areas.

5.2 Acquisition of soft skill competencies and personal development

The MBA Sustainability Management program places a lot of emphasis on the development of soft skills as these competencies are considered highly relevant for change agents for sustainability (Hind et al. 2009; Svanström et al. 2008). With average results of the aggregated data of 2.39 to 2.72 on the 6 point Likert scale and a small statistical spread the competence development goals can be seen as largely achieved (Table 3).

Table 3: Extent of perceived generic competency acquisition (n = 68)

Generic compentencies	Extent of perceived competency acquisition (1 – very comprehensive, 6 – not at all), average
Methodological competencies	2.72
Social competencies	2.57
Personal competencies	2.39

In the field of personal competencies remarkable high increase was reported with respect to self-management (average 2.2, n = 67) and self-learning skills (2.15, n = 64). It can be concluded that the blended learning concept with various challenges for work-life-balance, a low level of external control, clear orientation on results and a high degree of freedom particularly promote these competencies. Respondents simultaneously regard self-management and self-learning skills as highly relevant for professional life (average 1.9 on a 6 point scale with 1 indicating highest relevance).

In addition, it is especially noteworthy that the alumni reported substantial gains in motivation to implement sustainable development (average 2.08, n = 63). On the question for the contribution of the MBA to personal development an average assessment of 2.48 and agreement by 82 % f the respondents indicate that the program substantially contributes to the personal development of the individuals. It is interesting to note that the assessment of contributions to personal development does not correlate with the respondent's age and length of working life.

The results of the survey confirm that the vast majority of the students perceive that the ultimate goal of the MBA program, to educate change agents for sustainability, has been achieved well. 92.2 % of respondents agree that they feel enabled to act as a change agent for sustainability (average: 2.28 on a 6 point Likert scale). The responses suggest that especially entrepreneurial thinking (average 2.48), the ability to convince others with attractive and plausible concepts (average 2.07) and the motivation to implement sustainability (2.07) have increased significantly.

5.3 Career paths

The vast majority of alumni currently work in the field of sustainability management; for almost 56 % of the respondents sustainability management is the main focus of their occupational activity (Figure 2). With the exception of 3.1 % (i.e. mostly because of parental leave) all MBA alumni are employed.

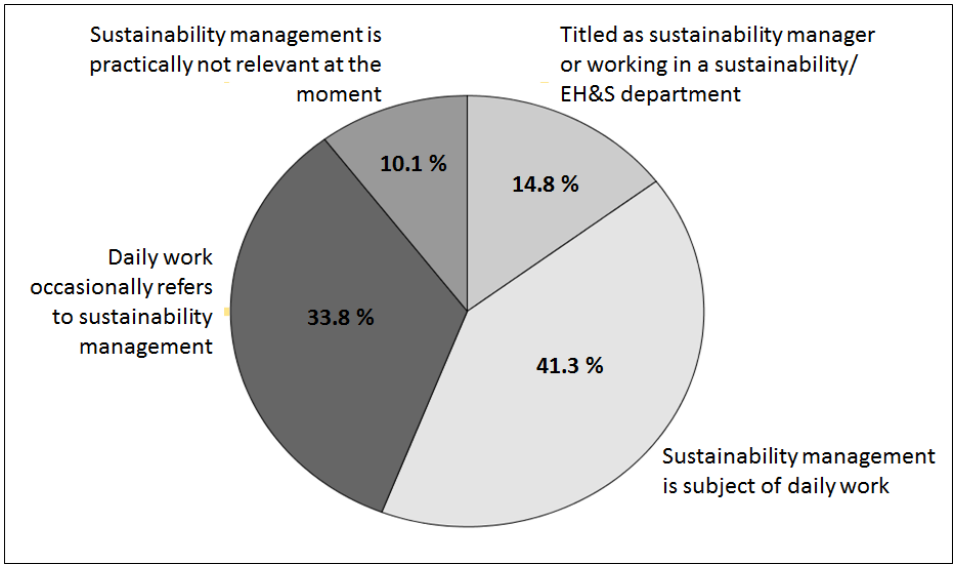

Figure 2: Sustainability management in the current occupational activity (n = 68)

A large group of students changed the job after or while studying the MBA. In the relatively short time period since MBA graduation (1–5 years, average: 2.8 years) 47 % of the MBA students who successfully finished their studies have changed the employer, 12 % have started their own business and an additional 14 % started to work in a new field of activity in their 'old' company. 75 % of all respondents mentioned that sustainability management has gained importance for their job. It thus seems reasonable to conclude that the sustainability orientation is a decisive aspect of the career plans and paths of the alumni.

With respect to changes in the hierarchical position (operationalized by the extent of management responsibility) and salary we observe minor effects. This may partially be related to the relatively short time period between MBA graduation and the survey. A full quarter of the alumni climbed into a higher hierarchical position, in most cases (64.7 %) related to sustainability management. Interestingly enough 12.9 % hold a lower hierarchical position compared to when commencing the MBA, which in each case was accompanied by a change of the employer and for the majority linked to a change into a sustainability-oriented field of activity.

A slight majority of the respondents registered a salary increase after the MBA graduation (Table 4). The effect of the MBA title in sustainability management, however, cannot be separated from the general salary development of highly skilled professionals.

Table 4: Salary development after MBA graduation (n = 58)

	Proportion of respondents (in percent)
No change	44.8 %
Salary increase < 10 %	24.1 %
Salary increase 10-30 %	17.2 %
Salary increase > 30 %	13.2 %
	100 %

Personal career development after MBA graduation is assessed very heterogeneously. Most respondents (58.3 %) mentioned an unconventional understanding of 'career', going along with increased fulfillment, self-determined and chosen work content, learning opportunities and meaningfulness. About half of the respondents (53 %) perceive a conventionally positive career development as a result of the MBA in sustainability management whereas others stated that the study has been beneficial for personal development but not directly linked to their career path. Nevertheless, 60 % see good opportunities for future career development.

The results show that the MBA in sustainability management substantially increased motivation of the students to start an own business. 27.3 % of the respondents are motivated to set up a company, more than half of them already founded a new business during or after their MBA studies and another 4.5 % are currently in a start-up phase.

In summary, when searching for a job or position where they could apply sustainability management many graduated MBA students changed their job (at the same employer or to a new employer), further developed their current job to include sustainability management (i.e. enlargement of job description) or created their own new job (i.e. by founding a company)

with the effect that they put themselves in a position which requires new competencies. The career development can thus be described as dynamic and unconventional, requiring new competencies compared to the former job.

5.4 Requirements of a new occupational field

A crucial question for curriculum development in sustainability management is whether significant differences exist between the competencies required for sustainability managers and for 'conventional' managers and if such differences exist, which competencies prove to be the most important ones for sustainability managers to be successful in corporate practice.

To investigate in detail which competencies sustainability professionals perceive as highly relevant for their job we analyzed the survey results for the sustainability management professionals in comparison with those with predominantly conventional jobs. Table 5 compares the answers of respondents who deal with sustainability matters every day (group 1: full-time sustainability professionals, n = 35) with those MBA graduates who at the moment only occasionally or hardly ever deal with sustainability management (group 2: other occupational focuses, n = 25; see also Figure 2). Although all respondents have similar mind-sets and work in comparable hierarchical management positions we can observe some statistically significant differences in the field of subject-specific competencies, which may not be astonishing, but also with regard to methodological, social and personal competencies (Table 5).

Table 5: Relevance of competencies for daily work (* indicating where the mean of group 1 is statistically significant lower than group 2 with $p < 0.05$)

		Group 1: Full-time sustainability manager	Group 2: Other occupational focus
		Relevance for daily work (1 – very important, 6 – not important), average	
Subject-specific competencies	General management	2.37	2.62
	Strategic management	2.56*	3.40
	Marketing	2.85*	3.76
	Fundamentals of sustainability management	1.68*	3.61
	Strategic sustainability management	1.91*	3.96
	CSR	2.26*	4.11
	Sustainability marketing	2.79*	4.53
	Instruments of Sustainability Management	3.08*	5.15
	Sustainability communication & reporting	2.44*	4.19
	Measurement & assessment of sustainability performance	2.38*	4.92
	Technology and innovation management	3.52*	4.46
Methodological competencies	Analytical skills	1.72	2.16
	Creativity techniques	2.56*	3.25
	Problem-solving abilities	2.41	2.62
	Decision-making abilities	2.41	2.42
	Learning & working techniques	3.35	2.87
	Presentation techniques	1.88	2.37
	Negotiation methods	2.29	2.60
	Project management	2.09	2.60
	Information & media literacy	2.47*	3.37
Social com-petencies	Communication skills	1.79	2.00
	Ability to cooperate	1.73*	2.29
	Ability to handle conflict and criticism	2.00	2.29
Personal competencies	Motivational capabilites	1.70	2.21
	Self-confidence	1.85	1.88
	Self-management	1.79	2.00
	(Self-)Learning abilities	1.97	2.17
	Self-initiative	1.68*	2.28
	Decision-making skills	1.83	2.04
	Commitment to principles and values	2.26*	3.52
	Ability to reflect ethical questions	2.57*	3.65
	Entrepreneurial thinking	2.20	2.54

When comparing the two columns in Table 5, we can conclude that the relevance of generic competencies for their job seem to be given higher importance by sustainability professionals than for managers working in other occupational fields. Although the difference is not statistically significant for all competency elements there is a clear tendency.

Examining the top 15 competencies considered most relevant by sustainability professionals (Table 6) shows that profound knowledge in sustainability management tops the list. This

indicates that this subject-specific competency is not only largely acquired through the MBA program but also highly important for the practical work of sustainability managers.

Table 6: Top 15 competencies as perceived by sustainability practitioners with successful completion of their studies MBA sustainability management

	Sub-competency	Relevance for sustainability managers	Type of sub-competency
1	Fundamentals of sustainability management	1.68	subject-specific
2	Self-initiative	1.68	personal
3	Motivational capabilites	1.70	personal
4	Analytical skills	1.72	methodological
5	Ability to cooperate	1.73	social
6	Communication skills	1.79	social
7	Self-management	1.79	personal
8	Decision-making skills	1.83	personal
9	Self-confidence	1.85	personal
10	Presentation techniques	1.88	methodological
11	Strategic sustainability management	1.91	subject-specific
12	(Self-)Learning abilities	1.97	personal
13	Ability to handle conflict and criticism	2.00	social
14	Project management	2.09	methodological
15	Entrepreneurial thinking	2.20	personal

The vast majority of the following positions in Table 6 refer to methodological, social and personal competencies. This result underpins the approach to incorporate intensive soft skill training into the curriculum of a higher degree program in sustainability management.

6. CONCLUSIONS

Although an increasing number of programs in sustainability management have emerged for the last couple of years, empirical findings about the requirements of the profession and effective methods to educate change agents for sustainability are still limited. This paper shows that research needs to be expanded with regard to the practical experiences graduated MBA students make when applying the knowledge acquired in their studies and in comparing the curriculum with the gaps they identify for additional and changed course contents and the didactical approach. Illustrated with the case of the MBA Sustainability management at Leuphana University in Lueneburg and the responses of the alumni survey acquired and needed competencies are discussed.

The general trend mentioned in literature that sustainability management is a "flourishing profession" (Visser and Crane 2010) can be confirmed by the alumni survey results of one of the first MBA programs in sustainability management. A rising number of applications from traditional business sectors, a growing share of employers who pay part or all of the enrollment fees (rising from 5.2 % in 2005 to 15.6 % in 2012) and the recent inclusion of the CSM's MBA sustainability management in the corporate academic program of a leading German car manufacturer provide evidence for this observation. The largest increase in interest stems from consultancies, financial service providers, NGOs, public institutions and multinational companies, many of them not having established a strong sustainability agenda in the past. This may be seen as an indicator that sustainability management has entered mainstream businesses. A 'mainstreaming' shift from sustainability management in leading, particularly sustainability oriented companies to sustainability management in more conventional companies transforming their processes, products and strategies can be expected to require new and other competencies of sustainability managers.

The literature review and the results of the alumni survey suggest that acting successfully as a change agent for sustainability requires flexibility to maybe change or create jobs, and a large set of different competencies, including general management and subject-specific competencies in sustainability management, methodological, social, and personal competencies.

Taking together the literature review and the empirical findings of the alumni survey we suggest a functional approach (Cheetham and Chivers 1996, Weinert 2001) to develop competence profiles for change agents for sustainability. Table 7 shows a competency matrix which attempts to integrate a classification of competencies often mentioned in literature (columns in Table 7 with subject-specific, methodological, social and personal competencies) with the responses of the sustainability management professionals what competencies they require to successfully master their practical work (rows in Table 7 from identify and develop business cases for sustainability to communicating sustainability performance). The foundation of this competency matrix includes key competencies discussed in higher education for sustainability (see Section 3.2 and Wiek et al. 2011). Whereas sustainability professionals value general strategic and marketing management competencies even more than other professionals who have completed the MBA in sustainability management (Table 5), subject specific, methodological, social and personal competencies are among the top competencies as perceived by sustainability practitioners who successfully completed of their

MBA studies sustainability management (Table 6). This result highlights the importance to incorporate intensive soft skill training into the curriculum of a higher degree program in sustainability management and to design the whole learning environment according to the principles of blended learning, self-directed and collaborative learning, inter- and transdisciplinarity, and networks for life-long learning with space for informal learning (e.g. Jamieson 2009).

This competency matrix does not include all 'conventional' basic competencies of academic education (such as critical thinking and basic communication skills) which of course remain important. It emphasizes those competencies which have been perceived by the graduated working MBAs to be of particular importance for their occupational field.

Table 7: Competency matrix for change agents for sustainability

Job duties & fields of activity \ Sub-competencies	Subject-specific competencies	Methodological competencies	Social competencies	Personal competencies
Identify and develop the Business Cases for Sustainability	▪ Understand economic terms, definitions, theories, concepts, tools, and the difference between „traditional" and sustainability economics ▪ Understand the drivers for corporate sustainability ▪ Understand principles of Sustainable & Social Entrepreneurship	▪ Apply methods of complex problem solving, decision making, systems thinking, and forecasting	▪ Ability to identify strategic partners ▪ Ability to inspire others	▪ Visionary and anticipatory thinking ▪ Courage to challenge the status quo and take unconventional paths
Present attractive solutions to gain top management commitment	▪ Anticipate market trends and develop innovative sustainable products and services	▪ Use interdisciplinary work to develop innovative solutions ▪ Apply creativity techniques ▪ Presentation methods	▪ Ability to inspire others ▪ Power of persuasion	▪ Self-confidence ▪ Show compassion and engagement ▪ Tenacity ▪ Frustration tolerance
Participate in strategy development	▪ Analyze risk and opportunities and develop sustainable corporate and competetive strategies ▪ Identify and structure strategically relevant sustainability issues (climate change, human rights, biodiversity etc.)	▪ Knowledge of analytical, planning, and forecasting methods and software tools	▪ Ability to identify strategic partners ▪ Ability to inspire others	▪ Visionary thinking ▪ Decision-making ability ▪ Strong commitment to principles and values ▪ Ability to reflect ethical questions
Integrate sustainability aspects into core business and core processes	▪ Understand basic principles and the interconnectedness of social, environmental and economic systems ▪ Recognize the relevance of ecosystem services and societal embeddedness for corporate success ▪ Knowledge of the principles of sustainable development ▪ Understand business processes & models ▪ Linking CSR to core business ▪ Understand complex supply chains and approaches to improve its sustainability performance	▪ Use interdisciplinary work, methods of systems thinking, and collaborative tools for fruitful discussions and innovative solutions	▪ Ability to communicate in interdisciplinary and intercultural contexts	▪ Ability for self-motivation and self-management ▪ Self-confidence ▪ Self learning skills ▪ Perceived self-efficacy ▪ Strong commitment to principles and values ▪ Tenacity ▪ Critical thinking, ability to reflect ethicalquestions
Design and direct a Sustainability Management System	▪ Knowledge of relevant standards, requirements and steps to implement and maintain a management system following the Plan-Do-Check-Act cycle	▪ Knowledge of relevant software tools ▪ Project management	▪ Ability to communicate in interdisciplinary contexts ▪ Abililty to build teams	▪ Self-confidence ▪ Self learning skills ▪ Decision-making ability ▪ Tenacity
Conduct sustainability audits	▪ Familiarity with standards , framework, and sustainability programs ▪ Understand objectives, auditor's role and steps of internal and external audits	▪ Project management ▪ Knowledge of methods to prepare an audit, gather evidence and prepare audit reports	▪ Ability to communicate in interdisciplinary contexts ▪ Mediate and resolve conflicts	▪ Self-confidence ▪ Ability to reflect ethical questions ▪ Show personal responsibility
Measure sustainability performance	▪ Linking monetary and physical, internal and external information ▪ Understand the concept of eco-efficiency ▪ Develop relevant sets of indicators	▪ Apply methods & software tools of sustainability accounting	▪ Ability to communicate in interdisciplinary contexts	▪ Self learning skills ▪ Tenacity
Support managers and teams to improve sustainability performance	▪ Knowledge of relevant drivers, concepts and tools for corporate divisions, departments, and functional areas ▪ Identify attractive solutions and viable options	▪ Use interdisciplinary work, moderation techniques, and collaborative tools	▪ Ability to inspire and empower others ▪ Empathy and solidarity ▪ Abililty to build teams and act flexibly as leader or follower	▪ Show compassion and engagement ▪ Visionary thinking ▪ Self-confidence ▪ Ability to reflect ethical questions ▪ Show responsibility
Networking with various stakeholders	▪ Categorize stakeholders and develop adequate stakeholder management strategies ▪ Identify Win-Win situations	▪ Ability to use moderation, conflict solving, and negotiation techniques	▪ Ability to communicate in interdisciplinary and intercultural contexts ▪ Mediate and resolve conflicts ▪ Ability to identify strategic partners, develop alliances and act reliably in networks and coalitions	▪ Self-confidence ▪ Strong commitment to principles and values ▪ Ability to reflect ethical questions ▪ Empathy and ability to change perspectives
Communicate sustainability performance credibly	▪ Understanding the challenges for credible sustainability communication ▪ Knowledge of approaches to reduce asymmetric information ▪ Knowledge of communication frameworks, guidelines and international standards	▪ Presentation methods ▪ Information & media literacy	▪ Ability to communicate in interdisciplinary and intercultural contexts ▪ Power of persuasion ▪ Empathy and solidarity	▪ Strong commitment to principles and values ▪ Reflexivity ▪ Show responsibility
Key competencies ▪ Strategic competence ▪ Systems-thinking competence ▪ Anticipatory competence ▪ Normative competence ▪ Interpersonal competence				

The combination of job requirements as perceived by the alumni and the competencies as defined in literature allows to systematically discuss how a conceptually developed higher educational program for sustainability management contributes and may have to be further developed to meet the practical needs of sustainability professionals.

The results of the alumni survey and their discussion in the light of the competence matrix provide an interesting insight into the effectiveness of sustainability management education

with the cases study of CSM's MBA Sustainability Management at Leuphana University Lueneburg.

In spite of the general confirmation of the didactical concept of CSM's MBA sustainability management program we have identified several starting points for further improvement. The biggest potential lies in the integration of soft skills and general management know-how into all MBA modules without increasing the workload or losing specific sustainability management content. The results of the alumni survey indicate the practical relevance of sustainability marketing, entrepreneurship and sustainability information management (including measurement and communication issues) and the necessity to design complex modules which support interdisciplinary, cross-boundary thinking.

Our research furthermore suggests that the competence profile of a change agent for sustainability is not only more complex but possibly also more demanding in almost all competency fields than those of conventional managers. This raises the question what is the right balance between teaching general management and subject-specific management know-how and the training of the soft skills within the limited time of a continuous part-time MBA program. The responses from the alumni survey suggest that specific sustainability management knowledge and soft skills are vital for sustainability practitioners and that social and personal competencies should therefore be given sufficient space in the education. A blended learning and learner-centered concept with high flexibility, group work, intensive tutorial guidance, a close link of theory and practice as well as several co-curricular options and opportunities for informal learning seem to be essential for the education of organizational and corporate change agents for sustainability, particularly in a part-time program. Intensive networking and an active alumni association support change agents for sustainability to create and maintain motivation, improve career opportunities and provide a platform for continuous formal and informal learning.

Taking this line of thinking up, this paper aims at intensifying the exchange of experiences within the community of higher education for sustainability management to support the joint further development of the profession in theory and practice.

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