Interdisciplinarity: Practical approach to advancing education for sustainability and for the Sustainable Development Goals

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Abstract

The need for a more sustainable world was unanimously acknowledged by United Nations members in September 2015, when 17 Sustainable Development Goals (SDGs) were set, positioning education at the heart of the strategy to promote sustainable development. This paper aims to demonstrate the importance of adopting an interdisciplinary approach to education for sustainable development, and to illustrate how to advance it, acknowledging different perspectives of sustainability and corporate social responsibility (CSR) in the context of diversity. It examines the broad agenda of the SDGs, which requires the participation of multiple disciplines and sectors to be delivered. Considering the Principles for Responsible Management Education (PRME), the paper reviews the literature regarding interdisciplinarity and its application in education for sustainable development, including practices and barriers to enhance it. A case study is provided to illustrate how to advance interdisciplinary education for sustainable development amongst postgraduate MBA students from different backgrounds, in a course where sustainable development concepts are already embedded across disciplines. The case illustrates the application of the Six Principles of PRME and explains how a sustainability and CSR module can encourage students to combine knowledge from all disciplines in order to advance their understanding and action on sustainable development issues.

1. Introduction

> *What if we broke down the silos in the universities? What if all professors practiced what they taught? What if we embraced the kind of multidisciplinary perspective that is reflected in your membership? What if we had courses that brought together examples from not just the business world, from political sciences, law, from environmental studies, so students get a richer appreciation of the challenges they will confront when they graduate? Why does a case have to be taught in one lesson? Why can't we take a business case and deal with all these multifaceted issues over two weeks? Why can't we get all the disciplines to come and teach it, so that students get an appreciation of the depth of the knowledge they've got to have when they go out to the real world?* [Indra Nooyi, Pepsico CEO] (Nooyi, 2016, 1:04:32).

Sustainable development has been identified as an important area of focus for business leaders, governments, universities, non-government organisations (NGOs) and the media. The need for a more sustainable world became more evident with the global financial crisis of 2008 and has been conveyed by the United Nations (UN) through several initiatives, including the Global Compact, a catalyst that highlighted the importance of a global sustainable development strategy, bringing together companies, public sector and civil society. The UN has placed education at the heart of its strategy to promote sustainable development and has supported the Principles of Responsible Management Education (PRME) and the Unesco Global Action Programme on Education for Sustainable Development, whilst defining 2005-2014 as the UN Decade for Education for Sustainable Development. There is clearly a drive to embed sustainability across the curriculum, which is closely monitored by accreditation bodies.

This paper aims to demonstrate the importance of adopting an interdisciplinary approach to education for sustainable development, and to illustrate how to advance it, acknowledging different perspectives of sustainability and corporate social responsibility (CSR) in the context of diversity. It commences by examining the broad agenda of the Sustainable Development Goals (SDGs), followed by the literature regarding interdisciplinarity and its application in education for sustainable development, including the Six Principles of PRME, practices and barriers to enhance interdisciplinarity. A case study is provided to illustrate how to advance interdisciplinary education for sustainable development amongst postgraduate MBA students with diverse backgrounds, attending a course where sustainable development concepts are already embedded across disciplines. The case also illustrates the application of the Six Principles of PRME, followed by the conclusions.

This paper adopts the definition for sustainable development proposed by the Brundtland Commission (WCED, 1987, p. 43): "development that meets the needs of the present without compromising the ability of future generations to meet their own needs", reiterated by the International Institute for Environment and Development (IIED, 2002): the goal of integrating economic activity with environmental integrity, social concerns and effective governance systems, while maximising the contribution to the well-being of the current generation, fairly sharing the cost and benefits, without compromising the potential for the next generations to meet their needs. This broad definition was selected for this paper based on three reasons: its dominance in discussions on environment and development (Baker, 2016), this is the definition adopted by the UN and it is broad enough to encompass distinct contextual nuances. Although there are differences between the expressions sustainable development and sustainability – for example, for Robinson (2004), sustainable development may reflect a managerial and incremental approach, more attractive to government and business, while sustainability focuses the attention on people's ability to continue to live within environmental constrains, more adopted by NGOs and academic environmentalists – both terms are used interchangeably throughout this paper.

2. Education and the Sustainable Development Goals

Building on the Millennium Development Goals set in 2000, 17 SDGs were formally adopted by all 193 member states of the UN in September 2015, aiming at ending extreme poverty, protecting the planet and ensuring prosperity for all by 2030 (UN, 2015). The SDGs expanded the agenda to include issues such as climate change, sustainable consumption, innovation and the importance of peace and justice, requiring all countries to take action, including those with high levels of development.

Fig 1. The Sustainable Development Goals (SDGs).

Promoting quality education is critical for enhancing people's lives and advancing sustainable development (Unesco, 2014). For this reason, the 4th SDG was established, with a specific target focused on education for sustainable development (UN, 2015, p. 21):

> *By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development.*

Some disciplines have encouraged the discussion of sustainable development in their respective fields, contributing to raise awareness amongst students and professionals and to motivate them to play their role to deliver the SDGs. In geology, for example, Gill (in press) graphically demonstrated the interconnectedness between geosciences and the SDGs, arguing that geologists can support each of the 17 goals. For instance, geologists can contribute to achieving the 3rd SDG on good health and well-being through their understanding of agrogeology, hydrogeology and contaminant geology, as illustrated in the following figure:

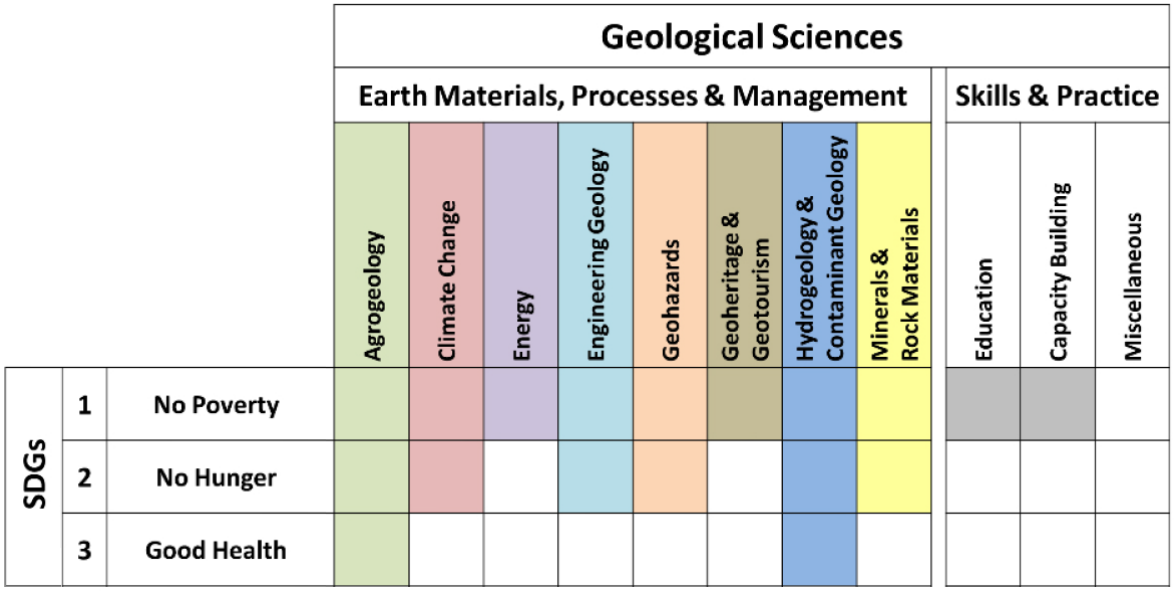

Fig. 2. Interconnectedness between geosciences and the SDGs, adapted from Gill (in press).

Increasing globalisation demands that future leaders appreciate the complex and controversial issues related to sustainable development. It became apparent that business professionals must be able to employ concepts from a variety of areas (including ethical theory, human rights, climate change, biodiversity and stakeholder management) to develop and implement responsible corporate strategies and practices. Besides preparing students to evaluate sustainability issues, sustainable development education must promote the ability to work with stakeholders with distinct (and sometimes, conflicting) interests and value systems in order to find common goals (Dale and Newman, 2005).

3. Interdisciplinarity

Knowledge is usually fragmented in disciplines, in educational and professional environments, but interdisciplinarity can increase the ability to understand the complex challenges the world currently faces (Eagan, Cook and Joeres, 2002). Integrating disciplines facilitates problem-solving as it promotes better understanding of each part that comprises a problem and fosters solutions which blend concepts from different disciplines. Interdisciplinarity enables “mutual development of the distinctive areas of expertise which different subjects may have to offer” (Summers, Childs and Corney, 2005, p. 630).

According to Clark and Wallace (2015), knowledge is classified as disciplinary (when disciplines work in isolation), multidisciplinary (disciplines working in parallel to address common goals), interdisciplinary (when disciplines work in an integrated way) and transdisciplinary (when there are no limits between disciplines), being a discipline defined as “any comparatively self-contained and isolated domain of human experience which possesses its own community of experts” (Nissani, 1997, p. 203).

Kysilka (1998) places four different models of curriculum integration on a continuum, based on the level of integration between disciplines. The first is the traditional model, where content is taught in separate disciplines and any integration that may take place is prompted by the learner. The second model still considers the disciplines as the main focus of the curriculum, but teachers make deliberate efforts to connect the learning

with real-life and other disciplines. The third stage is the interdisciplinary model, which "requires a breaking down of the rigid content area boundaries" (Kysilka, 1998, p. 205) and efforts are made to blend skills and concepts from the traditional disciplines to promote the understanding of a specific theme, providing teachers with common time (teachers crossing the limits between disciplines may encourage students to do the same). The integrated curriculum is at the end of the continuum, when the curriculum is organised around student choices and teachers behave as facilitators in the learning process. The following image summarises the four models of curriculum integration described by Kysilka (1998):

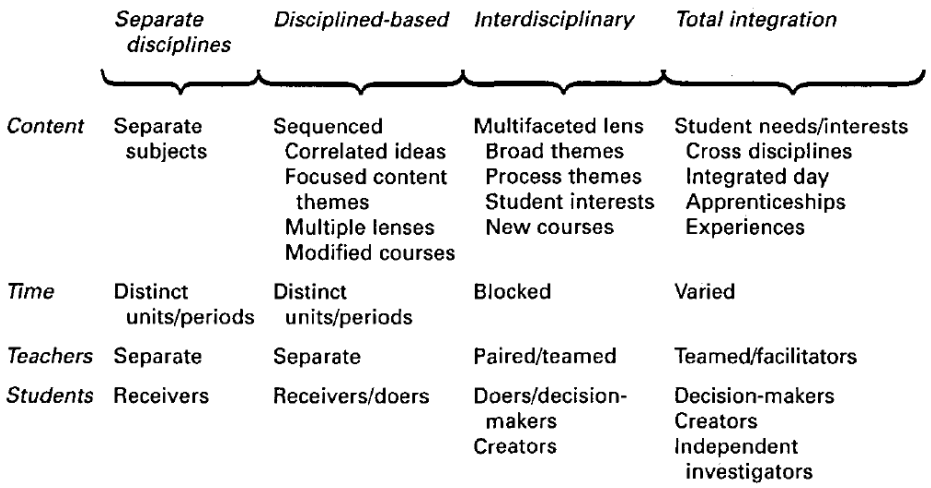

Fig.3. Integrated curriculum continuum (Kysilka, 1998, p. 204).

Interdisciplinarity is built on disciplinarity (Foster, 1998), as an individual must know at least one discipline for exploring new ways of thinking beyond its limits. For Dale and Newman (2005), sustainable development literacy "derives from a progression of disciplinary thought from both the natural and social sciences" (p. 356).

Burgess and Slonaker (1978, p. 2) highlight the dynamics and openness of interdisciplinarity:

> *[Interdisciplinarity promotes] ways and means for blending wisdom and science, for balancing free association and intellectual discipline, for expanding and refining information, and for building a problem-solving culture that mixes 'permanent' with 'transient' membership, thereby remaining open to new membership and fresh ideas while retaining a capacity for cumulative learning that refines, clarifies, and simplifies.*

The openness mentioned above seems particularly aligned to the 16th SDG, aimed at promoting peaceful and inclusive societies.

The need for implementing interdisciplinarity is mainly based on the argument that it would be improbable to obtain the expected learning outcomes thorough the disciplined-based model, as stated by Mansilla (2005, p. 16) when defining interdisciplinarity understanding: "the capacity to integrate knowledge and modes of thinking drawn from two or more disciplines to produce a cognitive advancement – for example, explaining a phenomenon, solving a problem, creating a product, or raising a new question – in ways that would have been unlikely through single disciplinary means".

3.1 Implementing interdisciplinary education

> *Individual teachers are very limited in what they can accomplish. They can help students to see relationships, they can find ways to apply information to real world activities, but the overall impact they may have on helping students see the connections between what they learn in school and what they need to survive in society is slight* (Kysilka, 1998, p. 207).

Increasing demand for problem solving has fostered interest in collaboration between educators. According to Klein (2006), proactive interdisciplinary initiatives started at the beginning of the twentieth century and in 1970s, the first international conference on interdisciplinary teaching and research in universities took place, co-sponsored by the Organisation for Economic Cooperation and Development (OECD). Amongst the progresses

in this area, interdisciplinary activities have been prioritised by federal funding agencies in the USA, including large-scale research programmes, innovative graduate curricula and undergraduate training courses (Holley, 2009).

Although interdisciplinarity benefits are generally acknowledged, some contexts may delay its implementation. Kysilka (1998) mentions three barriers for increasing integration between disciplines: the education assessment model, insufficient time and limited knowledge base. In some regions, the assessment model may discourage teachers to try new ideas, as they are held accountable if students fail to achieve a minimum grade in standardised tests. Time is also a constraint in some situations, as teachers need time for developing an integrated curriculum and for working collaboratively, and most administrators will not provide this time unless the whole school is committed to change the curriculum. For Kysilka (1998, p. 208), "the entire teacher education process needs to be restructured if we are to have teachers who can operate within a different model of the school curriculum" as it is necessary to train teachers deeply and broadly, demonstrating the interconnectedness between disciplines. Restructuring teachers' training would also address the "tendency for practitioners to retreat back to a single discipline" (Dale and Newman, 2005, p. 358) without capturing the holistic nature of sustainability issues.

Holley (2009) mentioned two other challenges to implement interdisciplinarity. Firstly, developing an interdisciplinary language to achieving mutual understanding, as language may carry specific meanings in distinct disciplines. Secondly, as the allocation of resources is usually based on the division of departments, interdisciplinary projects may require specific governance. However, analysing research universities in the USA, Holley (2009) identified that institutions are indeed engaged in interdisciplinary initiatives on multiple organisational levels, implementing change strategies related to senior administrative support, collaborative leadership, flexible vision, faculty/staff development and visible action. Several examples were provided to illustrate these change strategies, such as interdisciplinary initiatives included in strategic plans, faculty collaboration, funding for interdisciplinary research and teaching, and construction of interdisciplinary buildings on campus.

4. Interdisciplinarity in education for sustainable development

Sustainable development touches several disciplines, such as environment, biology, medicine, nutrition, agronomics, geography, engineering, architecture, citizenship, sociology, psychology, political science, history, law, economics and business. Given the breadth and the interconnectedness of the sustainable development agenda, the SDGs cannot be pursued in isolated disciplines, as stated by DeFries *et al.* (2012, p. 603):

> *Scientists from many arenas — including physical, biological, and social scientists — and engineers working from local to global scales need to bring together the scientific knowledge, tools, and approaches to assist society in developing solutions for pressing sustainability challenges while helping societies to advance.*

The need for adopting an interdisciplinary approach for sustainable development education has been raised by several authors (Dale and Newman, 2005; Eagan, Cook and Joeres, 2002; Luppi, 2011; Summers, Childs and Corney, 2005) and by Unesco. Reorienting the existing education programmes to include more aspects related to sustainability and its three pillars (society, environment and economy) should be achieved in a holistic and interdisciplinary context, with teachers weaving sustainability issues into the curriculum (Unesco, 2005). "No one discipline can claim education for sustainable development for its own, but all disciplines can contribute" (Unesco, 2005, p. 31).

Only by following an interdisciplinary approach, sustainable development education will be able to confront "problems that cross traditional disciplines, involve multiple stakeholders, and occur on multiple scales" (Dale and Newman, 2005, p. 353), such as climate change, poverty and inequalities, acknowledging the interdependence between society and ecosystems.

Aside from learners acquiring skills and knowledge to comprehend sustainability issues, other social outcomes are also expected from education for sustainable development: it must prepare students and

professionals not just to reflect about the current challenges, considering social, economic and environmental perspectives, but to make appropriate decisions and take action to address them, achieving "its purpose by transforming the society" (Unesco, 2014, p. 10). Sustainable development literacy is the ability not only to understand global macro-problems but also to act on them at a local level in a changing context (Dale and Newman, 2005). For Luppi (2011), this perspective has increasingly been the focus of environmental education, promoting knowledge and "the behaviours, the strategies and the actions that can really reconvert our development models and our lifestyles" (p. 3244).

4.1 Practice of education for sustainable development

As a wide, complex and dynamic concept, sustainability provides several possibilities in terms of educational interventions, which must accommodate the evolving nature of its concept (Unesco, 2005). The principle of developing methods to enable effective learning experiences for responsible leadership has been collectively pursued by more than 650 higher education institutions signatories of PRME worldwide (PRME, 2015).

The Six Principles of PRME (Purpose, Values, Method, Research, Partnerships and Dialogue, detailed on Appendix 1) provide a framework for education institutions to embed sustainable development and ethics into the curriculum, within and across disciplines. Several reports have been presented on how higher education initiatives are advancing PRME objectives (PRME, 2017). Based on the existing literature, practices of education for sustainable development are reviewed in the next paragraphs, outlining their alignment to specific PRME Principles, additionally to PRME Principle 2, Values, present in all of them.

Eagan, Cook and Joeres (2002) examined an experimental interdisciplinary graduate-level seminar entitled 'Sustainability, culture and industrial ecology', delivered online at the University of Wisconsin-Madison and the University of Minnesota, both in the USA. The seminar was presented by instructors from engineering, business and public health schools, and guest lecturers, with weekly lectures on sustainability topics, followed by discussions. Lecturers represented perspectives from the USA, Germany, The Netherlands and Japan on the environment, highlighting the influence of culture at national, local and industry level, and also sharing strategies to help companies to become more environmentally responsible. Reading, writing and peer reviewing research papers were part of the seminar activities, encouraging teamwork and the development of a critical and tolerant view, aligned to PRME Principle 3, Method. The partnership between the two universities, as well as professors and professionals from different backgrounds presenting the lectures, illustrate PRME Principles 5 and 6, Partnerships and Dialogue. PRME Principle 1, Purpose, is also present by sharing practices to enhance corporate environmental responsibility.

Dale and Newman (2005) presented how sustainable development principles were incorporated into undergraduate and graduate level courses at the Royal Roads University, in Canada. The content of the courses embraced "the hands-on problem-based learning required of sustainable development education, as well as the transdisciplinary approach needed to familiarise students with the complexities of sustainable development" (Dale and Newman, 2005, p. 358). For the Masters degree in Environmental Management, that is offered as a MA and an MSc, students from natural and social sciences are mixed in three-week residencies, encouraging interdisciplinarity and transdisciplinarity, followed by online courses. These courses exemplify the application of PRME Principles 3, 4 and 6: Method, Research and Dialogue.

Luppi (2011) presented a constructivist e-learning project to train teachers and decision-makers in education for sustainable development, piloted at Bologna and Rimini campuses, in Italy. To deal with the complexity of sustainable development, teaching modules were organised into learning objectives – such as 'the history of sustainable development' and 'ecological, economic and social implications of sustainability'. Each learning objective contained knowledge from different disciplines and was built in three categories of objectives: theoretical, ethical and operational, the latter concerning sustainable choices in everyday life and the design of teaching interventions, followed by operational exercises. Organising the learning objectives into modular contents allowed learners to customise their educational path, being the student "the active subject in

the construction of his/her own knowledge" (Luppi, 2011, p. 3247). Although this project was not focused on higher education students, it is aligned to PRME Principles 1, 3 and 6: Purpose, Method and Dialogue.

Jain *et al.* (2013) examined how the concept of sustainable development was built through a postgraduate programme in Environmental Studies and Resource Management at The Energy and Resources Institute (TERI) University, in India, for students from diverse academic and professional backgrounds. The programme used "face-to-face interactions, live case studies, field visits, conferences, seminars and active use of information and communication technology" (Jain *et al.*, 2013, p. 20), combining theory and practical components with an interdisciplinary approach. Examples of sustainability issues addressed by TERI Institute were converted into case studies at TERI University, to promote students' understanding from how these issues affect people's lives to solution implementation. Students could choose the elective disciplines, defining within which streams they would like to acquire deeper knowledge. The final project was carried out in partnership with an industrial, research, government or non-government organisation. TERI University is PRME signatory and this experience suggests alignment to its Six Principles.

In the practices listed above, Dale and Newman (2005) and Jain *et al.* (2013) demonstrated how sustainable development principles were included in pre-existing courses, whilst Eagan, Cook and Joeres (2002), and Luppi (2011) presented frameworks developed specifically for teaching sustainable development. Context, course level, purpose, time length, audience and content were significantly different in these experiences, but techniques to foster interdisciplinarity were employed in all of them, such as teamwork activities, real-life examples and opportunities for students to make choices about the content. All such education for sustainable development practices contain some level of alignment with the Six Principles of PRME and integration between disciplines, but not all of them would be described as adopting Kysilka (1998) interdisciplinary curriculum approach. Even when education for sustainable development is provided through a combination of subjects, it can only be considered interdisciplinary when there is coordination and coherence across subjects (Summers, Childs and Corney, 2005).

4.2 Barriers to implementing interdisciplinary education for sustainable development

For Summers, Childs and Corney (2005, p. 627), "interdisciplinary initiatives do not have a good record of success" and for this reason, integration should commence with two or three disciplines to build the basis for enhancing integration in the future, being geography and science the strongest candidates to form a platform to teach sustainability. For Eagan, Cook and Joeres (2002), teaching interdisciplinary communication skills, tolerance for other perspectives, peer review evaluation skills and teamwork helps students to overcome some of the barriers that hinder interdisciplinary research and collaboration.

The case study in the next section demonstrates another way to apply interdisciplinarity to education for sustainable development.

5. Case study: Teaching sustainability to postgraduate MBA students in the context of diversity

5.1 The need for integrating sustainability principles into management education

Sustainability requires leadership of the private sector, alongside with government and civil society, as the private sector holds much of the advanced technologies and management systems that will be essential for the success of the SDGs (Sachs, 2012). According to the Global Compact (2016), businesses should first act responsibly and then pursue opportunities to address sustainable development issues, with innovation and collaboration. A number of concrete initiatives have been developed to promote sustainability within the private sector, including ethical sourcing, social standards, audits and socially responsible investing rankings, such as Dow Jones Sustainability Indices and FTSE4Good. Companies' contribution to a more sustainable world has been fostered by communication technologies, such as the internet and social media, as it may impact on their reputation. Although companies have established public-private partnerships, participated in policy development

and sponsored development actions, there is potential for leveraging the role of the private sector in human development (World Bank, 2009).

For the private sector to enhance its participation in the achievement of the SDGs, all parts of the business must be engaged. For operating responsibly and taking the opportunities associated with the SDGs, companies have to allocate resources in distinct departments, such as supply chain, human resources, research and development, finance, strategy, governance, government relations, community engagement, health, safety environment and security, while "understanding that good practices or innovation in one area cannot make up for doing harm in another" (Global Compact, 2016, p. 12). This relationship clearly demonstrates the need for interdisciplinarity and the ability to work with multiple stakeholders, internally and externally.

Professionals from different departments must comprehend short-term and long-term consequences of their decisions to all stakeholders, properly managing the risks involved and also seizing opportunities to promote development. Understanding the concept of sustainable development and its social, environmental and economic aspects, including issues such as decent work conditions and climate change, is crucial for business leaders to drive their institutions to operate in a responsible and sustainable way. It is important to adopt approaches which highlight the relevance of sustainable development to leaders from different disciplines and perspectives, and postgraduate MBA courses offer a huge potential to support this. MBA students include administrators, accountants, lawyers, engineers, entrepreneurs and other professionals from a variety of sectors, such as finance, manufacturing, energy, resources extraction, health care, construction and public services, including senior managers who work for companies with international aspirations. For Weybrecht (2010), every class that graduates without the knowledge and tools to make their companies more sustainable is a missed opportunity.

5.2 Integrating sustainability and the PRME Principles into a MBA course

The MBA course selected for this study is delivered in London and in Moscow and approximately 200 students enrol every year (80 students attending classes in the UK and 120 in Russia). The MBA is offered in three formats: as a full-time and part-time programme in London and as a part-time programme in Moscow, being the highest ranked MBA course in Russia. The course comprises a set of ten core modules and four electives, in addition to the delivery of a management research project (list of modules appears on Appendix 2). UK students have opportunity to attend some of the elective modules in Russia, with the MBA students enrolled in Moscow, which has proved to be a culturally rich experience for both cohorts.

The joint MBA programmes have common learning outcomes focused on general management theme, with a strong emphasis on strategy and in particular its execution and implementation. The need for preparing future leaders to deal with sustainable development issues resulted in embedding sustainability, business ethics and CSR into all MBA modules. In addition, a specific subject was developed, named Responsible Management, to provide a critical understanding of CSR and sustainability along with an appreciation of their development and growing importance. Business school academics have worked with colleagues from other departments, such as law schools, to develop and embed sustainable development issues across the curriculum. In postgraduate MBAs, sustainable development is often disconnected to the mainstream curriculum, but for being relevant to all students, the information has to be embedded in all disciplines and stand alongside the content already taught (Weybrecht, 2013).

Motivated by business needs and accreditation bodies, the UK business school – who is responsible for the design and delivery of the MBA course in both countries – has worked for more than a decade towards the Ten Principles of the UN Global Compact (Global Compact, 2014) and efforts were intensified as a result of the 2008 global financial crisis. The previous alignment with the Principles of Global Compact streamlined the implementation of the Principles of PRME, formally started in 2015. The Six Principles of PRME are integrated into the MBA course and both the UK and the Russian business schools are PRME signatories. PRME Principles 1 and 2, Purpose and Values, are embedded in the vision and strategy of the UK university, with specific objectives related to respect for individuals, communities and the environment, supporting realisation of

practical outcomes to benefit people and communities, and ultimately improving the world. Integration of PRME Principle 3, Method, can be demonstrated by innovation, creativity, enterprise and diversity being included in the UK university's values and practices, as illustrated by the role play technique mentioned in the next section, besides the university hosting a sustainability hub to support real-world learning opportunities to equip graduates with the knowledge, skills and behaviours for thriving and leading change. In alignment with PRME Principle 4, Research, connecting real examples with a contextual framework setting, while demonstrating that innovation and sustainability can enhance investment return, has contributed to increase the number of MBA research projects focused on topics aligned to sustainability. Examples include research in agriculture (an entrepreneurial project exploring the potential of organic buckwheat production in Russia), mining (development of an environmental reporting framework for the Russian coal industry) and corporate travel (assessing the impact of responsible travel on companies' value, resulting in a framework for implementing responsible corporate travel management practices). PRME Principles 5 and 6, Partnerships and Dialogue, are illustrated by the partnership between the UK and Russian universities to offer the joint MBA, in addition to partnerships with companies, government and NGOs in research projects and lectures, as well as the participation in other worldwide sustainability initiatives, such as the Academy of Business in Society (ABIS) and Aim2Flourish. The alignment with the Six Principles of PRME strengthened the support provided to students for enhancing their ability to act on sustainable development issues, contributing to generate practical knowledge to further embedding sustainability and ethics in the business world.

5.3 Teaching CSR and sustainability in the context of diversity

Students have different approaches to learning (Fry, Ketteridge and Marshall, 2014). This is especially important to recognise when teaching students or professionals with different needs, cultural backgrounds and experiences, requiring developing distinct teaching strategies for sustainable development. Although the underlying concept is the same, the subject is delivered in different ways to undergraduate and pre-experience postgraduate students, taking into account the different levels of experience, exposure to international business and expectations of the students.

Tailoring teaching to different audiences is one of the areas of importance within the core themes of the learning theory (Bryson and Hand, 2007). Teaching postgraduate MBAs across borders and within different international contexts is particularly challenging. For delivering the joint MBA, contextual differences between the students based in the UK and in Russia required careful planning and reflection as the teaching and learning material, and also the approach to explaining sustainable development concepts, required adaptation. Differences not limited to historical, political and cultural background, but also related to different interpretations of CSR, level of participation in multi-stakeholder dialogue on sustainable development and diversity of the cohort, were taken into account for making the necessary changes to the education approach and supporting materials.

In the UK, for example, social responsibility is predominantly associated to the notions of Carroll (1991, 1999, 2004) constructs and stakeholders, and Elkington (1999) Triple bottom line. But although Carroll's (1991) definition of CSR – comprised by economic, legal, ethical and philanthropic responsibilities – is present in Russia, "CSR influenced by the cultural and economic antecedents of both the Soviet Union and the transition period is also commonplace" (Crotty, 2016, p. 845). To accommodate different interpretations and encourage reflection about the topic, definitions of sustainable development and CSR are part of the initial content of the Responsible Management module of the MBA in both countries, encouraging students to adopt a critical view by discussing the scope and the case for and against CSR, including reflecting about how multinational companies deal with these contextual differences.

What students already know must be strongly considered when preparing and developing learning activities. Teachers should build on the known, emphasising the connection between the new learning and the old learning, starting with familiar examples and building on students' own experience (Biggs and Tang, 2011). For instance, mentioning initiatives led by international NGOs may be useful to explain current sustainable development issues to students based in the UK, as this a recurring topic on the media, exacerbated by

fundraising campaigns. On the other hand, in Russia, sustainable development and its intrinsic "concept of 'needs', in particular the essential needs of the world's poor" (WCED, 1987, p. 43) may be explained through the notion of collectivism from the socialist system. Teaching sustainability and CSR supports different educational approaches and in order to enhance the learning experience, adaptations to student's background is mandatory.

In the classroom, in addition to tutor-led discussions, several role-play scenarios are employed to take the theoretical frameworks off the page and into the workplace. Pavey and Donoghue (2003, p. 7) suggest role-play pedagogy is useful "to get students to apply their knowledge to a given problem, to reflect on issues and the views of others, to illustrate the relevance of theoretical ideas by placing them in a real-world context, and to illustrate the complexity of decision-making". The role-play scenarios included in the Responsible Management module involve students taking one of a number of stakeholder roles (such as factory manager, government official, International Labour Organisation representative, community representative, parent company CEO) who are given a fictional sustainable development issue to address. The roles are allocated to students and each student receives a brief on his or her role. Their negotiations take place in front of other students, who provide feedback and offer supportive critiques of the solution suggested. The scenarios require the students to draw on the other modules of the MBA and follow an interdisciplinary approach to identify the economic, societal and environmental implications of the issues they are given, and of their suggested course of action. This is an example of an educational process to support effective learning experiences for responsible leadership, aligned to PRME Method Principle.

Typically at the start of the course, the sustainability area is perceived by some Russian students as less important and an obstacle to profits, which makes it challenging to accomplish students' engagement with the concepts. However, by the end of the course, students are informed and enthusiastic about sustainability and they realise the importance of embedding sustainable development in the education system. As more multinational companies start operating in Russia, and Russian companies seek to expand abroad, sustainable development becomes more diffused into business decision-making in the country.

This case study illustrates how to promote education for sustainable development activities, aligned to the Six Principles of PRME and focused on students with different perspectives of sustainability. The case also acknowledges the potential of postgraduate MBA courses to promote sustainability within the private sector, especially if sustainable development is embedded across the curriculum. Although the disciplines continue to be integral part of this MBA course, sustainable development concepts are taught in all disciplines, and they are practiced in an integrated manner in the subject of Responsible Management, when students connect skills from all disciplines within the MBA to advance the understanding of the sustainability challenges. In contrast to other education for sustainable development practices mentioned in the literature, this case study illustrates how a specific subject within an MBA course that already has sustainable development concepts embedded in its curriculum can advance interdisciplinary thinking and consolidate the knowledge to act towards sustainable development and the SDGs. Likewise for other sustainable development practices, teamwork activities, real-life examples and students input are strongly encouraged throughout the course.

6. Conclusion

This paper is aimed at demonstrating the importance of adopting an interdisciplinary approach to education for sustainable development, as argued by several authors (Dale and Newman, 2005; Eagan, Cook and Joeres, 2002; Luppi, 2011; Summers, Childs and Corney, 2005), and to illustrate how to advance interdisciplinarity, acknowledging different perspectives of sustainability and CSR in the context of diversity.

The breadth and interconnectedness of the SDGs make it evident that professionals from different disciplines and sectors must work together to deliver the goals. Multifaceted issues – such as climate change, poverty and human rights – require knowledge and skills from distinct disciplines in an integrated manner. Interdisciplinarity promotes the ability to understand complex problems and act on them, aligned to the expected outcomes from education for sustainable development.

According to the literature, interdisciplinarity education has been challenging (Summers, Childs and Corney, 2005; Kysilka, 1998) and there are different ways to adopt interdisciplinarity in education for sustainable development (examples of practices in Dale and Newman, 2005; Eagan, Cook and Joeres, 2002; Jain *et al.*, 2013, Luppi, 2011). But although the benefits of interdisciplinarity are known, in general it depends on the students, sometimes prompted by their teachers, to adopt a perspective that considers social, economic and environmental aspects. Embedding sustainable development only in environmental courses, or creating specific disciplines not connected to the mainstream curriculum will not be sufficient to prepare individuals to make the necessary decisions in their day to day life to address sustainability challenges.

The case study provided herein illustrated how to advance the interdisciplinary approach in education for sustainable development, in alignment with PRME. The case, focused on a postgraduate MBA course where sustainable development is already embedded across disciplines, emphasised the importance of adapting the learning activities to students' previous knowledge and cultural background. It also explained how a sustainability and CSR module encouraged students to combine knowledge from all disciplines to advance their understanding of sustainable development issues.

This paper contributes to enhancing the literature about interdisciplinary practice in sustainable development education, including practices aligned to the Six Principles of PRME. It also intends to contribute to overcome the barriers to enhance interdisciplinarity in educational and professional environments, with the ultimate aim to contribute to increased capacity to deliver the SDGs.

APPENDIX 1

PRME Six Principles for Responsible Management Education (PRME, 2016, p. 40):

- *Purpose: We will develop the capabilities of students to be future generators of sustainable value for business and society at large and to work for an inclusive and sustainable global economy.*
- *Values: We will incorporate into our academic activities and curricula the values of global social responsibility as portrayed in international initiatives such as the United Nations Global Compact.*
- *Method: We will create educational frameworks, materials, processes and environments that enable effective learning experiences for responsible leadership.*
- *Research: We will engage in conceptual and empirical research that advances our understanding about the role, dynamics, and impact of corporations in the creation of sustainable social, environmental and economic value.*
- *Partnership: We will interact with managers of business corporations to extend our knowledge of their challenges in meeting social and environmental responsibilities and to explore jointly effective approaches to meeting these challenges.*
- *Dialogue: We will facilitate and support dialogue and debate among educators, students, business, government, consumers, media, civil society organisations and other interested groups and stakeholders on critical issues related to global social responsibility and sustainability.*

APPENDIX 2

Table 1

Modules that constitute the MBA course selected for the case study.

Core modules	Elective modules
Financial Management	Business Forecasting and Modelling
International Business Environment	Change and Creativity
Leadership and Professional Development	Corporate Finance
Marketing: Practice and Principles	Development and Growth of SMEs
Operations Management	Entrepreneurship and Innovation
Organisations and Management in a Global Context	Global Business
Responsible Management	Global Immersion (including study trip)
Strategic Decision Making	Innovation Finance
Strategic Execution & Implementation	Interactive Marketing
Strategic Information Management	Management Consultancy
	Operations Strategy

Management Research Project	Problem Solving 2.0: Systemic Solution Methods Public Sector Management Strategic Project Management Top Management Team and Corporate Governance Winning and Retaining Customers

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