SWOMM (sustainable ways of making money) approach: Entrepreneurship education for sustainable development

Sustainable Enterprise and Entrepreneurship

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Abstract

This paper explores the integration of the discipline of 'entrepreneurship education' and 'education for sustainable development' and offers a new perspective to practice sustainable development in the arena of business and entrepreneurship (called the 'SWOMM' approach – sustainable ways of making money). As a way to explore such integration, three sets of literature review were conducted and explored: the areas of UN and UK governmental strategies for sustainable development, education for sustainable development and entrepreneurship education. This subsequently discovered that research which promotes sustainable development in entrepreneurship is lacking, particularly with respect to educational provision. This paper therefore offers a process model for educationalists to facilitate their venture of integrating 'entrepreneurship education' with 'education for sustainable development' and argues for its importance.

Keywords: entrepreneurship education; education for sustainable development; social business; green business; sustainability; sustainable development; entrepreneurship

Biography

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Liz Walley joined MMUBS thirteen years ago as Senior Lecturer and is part of the Strategy and Entrepreneurship subject group. Her teaching and research subject area is sustainable development/ environmental management. Prior to MMU, her 15 years' work experience was in consultancy, banking and industry. Liz has published in the areas of environmental management and transition in Eastern Europe. Her current research focus is organizational greening and specifically the role of environmental champions and green entrepreneurs (e-mail: l.walley@mmu.ac.uk).

Introduction

This paper provides an alternative explanation for the concept of sustainable development in the business and industrial sector. The authors conceptualised a metaphor of a 'river channel' (Lourenço 2005) to illustrate such concept and subsequently guides the argument for the practice of sustainable development through entrepreneurial focus, particularly in educational provision. Three sets of literature investigation were conducted to explore such argument further within the areas of UN and UK governmental strategies for sustainable development, education for sustainable development and entrepreneurship education. These subsequently reinforced such argument and led to the development of learning elements for a new educational discipline called 'entrepreneurship education for sustainable development'. And finally, this paper offers a process model for educationalist to facilitate their venture of integrating 'entrepreneurship education' with 'education for sustainable development' and argues for its importance.

Sustainable development

Sustainable development (SD) is a model in which economic, social and environmental aspects are, arguably, given equal importance. This model for development entered the mainstream with the publication of 'Our common Future' by the World Commission on Environment and Development (WCED 1987). Sustainable development is now an emerging concept facing industry, practitioners, academics, politicians and society. This concept is about change, development, improvement and evolution in our way of running the economy and/or industry. This subsequently encourages innovation among existing and new businesses to take part. Hence 'change' and 'demand for innovation' generate opportunities for new business venture and entrepreneurial activity (Anderson 1998; Issak 1998; Walley & Taylor 2002).

To clarify the concept of SD in the business and industrial sectors, the metaphor of a 'river channel' had been developed (Lourenço 2005) (Figure 1). Imagine an economy where 'water' represents the generation of wealth, the flow of products and services, and the creation of jobs. Although this flow of 'water' provides lots of 'goods', it has by-products which harm the society and the environment (e.g. pollution, climate change, etc). However, if we want to change, we cannot block this 'river channel' directly [e.g. anti-capitalist (Klein 2001)], because stopping the 'water' flow would create 'flooding' (i.e. economic and social chaos) rather than providing solutions. Therefore, if we want to change we have to create a 'new channel' where the 'water' can flow and at the same time this 'new channel' avoids harming the society and/or the environment. In short, it is to move from 'Point A' to 'Point B' (Figure 1) without blocking the flow of 'water' (i.e. economy). Hence, economic, social and environmental aspects become mutually interconnected (symbiosis).

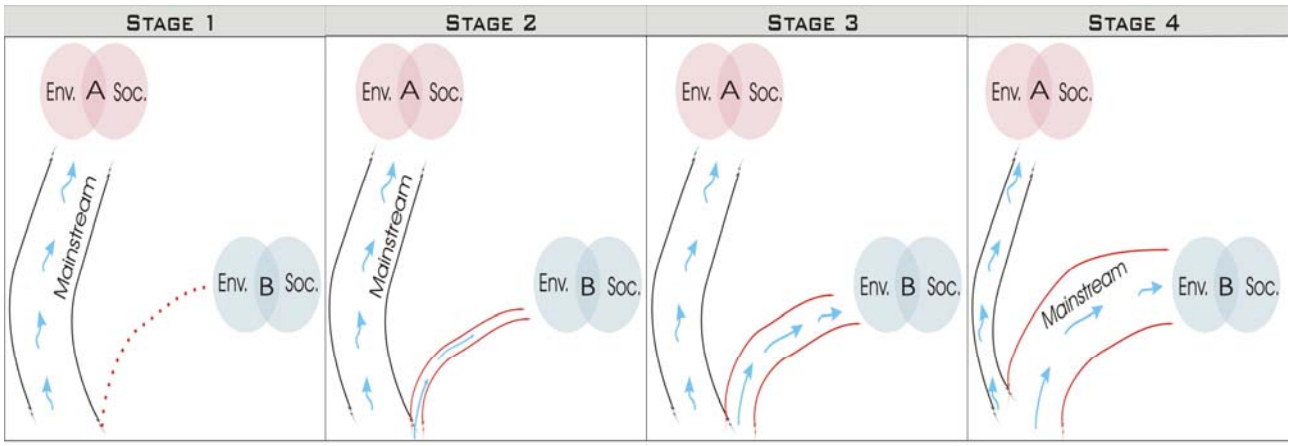

FIGURE 1 – THE 'RIVER CHANNEL' METAPHOR FOR SD (LOURENÇO 2005)

Agenda 21

In 1992, a programme known as 'Agenda 21' was created and adopted by over 170 states at the United Nation summit in Rio de Janeiro (UNESCO 2004b)). This programme forms a strategic document consisting '40 chapters' that looks into critical issues such as poverty, over-consumption, gender inequality, health, conflict and human rights. Each nation has to develop their own plans and strategies to achieve the vision set by the Agenda 21 according to each of its chapters (all types of stakeholders has their own role to play e.g. governments, nationals, organisations, non-organisations, society, individuals, employers and employees, professionals and practitioners). And in 2002, The World Summit on Sustainable Development at Johannesburg, progress had been reviewed, actions and strategies were developed further where the concern expanded into issues such as the access to water, sanitation, clean energy and the decline of ecosystems (e.g. UNESCO (2004b)).

'Chapter 30' within Agenda 21 focuses on business and industrial sectors with the objective of increasing the efficiency of resource consumption, reuse, recycling, waste reduction, cleaner production and technologies, and more effective environmental management. 'Chapter 30' also articulated objectives to promote the practice of SD among entrepreneurs and increase the number of owner-managers adopting SD in established firms (UNESA-DSD 2004).

UK Governmental strategies and entrepreneurship

The UK Governmental strategies for implementing the vision set in Agenda 21 emphasise promotion, awareness building, setting limits and incentives to implement the vision set by the Agenda 21 (HM Government 2005). Government strategies for the business and industrial sector aim to provide training and programmes for "eco-design, resource efficiency, innovation, supply-chain management, benchmarking, reporting and indicators, identify opportunities for better regulation, sector specific fiscal instruments, voluntary agreements or trading schemes, procurement policies, and product standards and/or labelling schemes" (p. 58). These approaches tend to facilitate organisational change, learning and continuous improvement (Senge *et al.* 1999; Molnar & Mulvihill 2003) i.e. 'Point A to Point B' approach (see Figure 1). However, there is only a short section articulating commitment to social enterprise and no specific strategy to boost-up the level of new forms of social and/or environmental entrepreneurship (p. 70). Hence, strategies which promote SD in entrepreneurship are lacking (i.e. new forms of businesses from 'Point B' onward - see Figure 1).

Whilst government regulations, initiatives and policies allied to demand for 'greener' products and services from some stakeholders have promoted considerable amount of innovation amongst existing businesses and industry (see Table 1), the literature indicates a lack of entrepreneurial focus, particularly with respect to educational provision (Wheeler *et al.* 1999; Springett & Kearins 2001; Coopey 2003; Cordano *et al.* 2003; DEFRA 2003a) (see below – Literature investigation). Entrepreneurs create or form SMEs (small and medium enterprise), these enterprises especially smaller-enterprises are more flexible and have fast response time to meet the rapidly changing world, and also account for substantial amount of innovation (Baumol 2004). 99.8 % of firms in Europe are SMEs, and account for 66 % of jobs and 64 % of turnover, and 94 % of SMEs are micro-business (i.e. firms with less then 10 employees) (Bridge *et al.* 2003). Thus, if SD is promoted within this arena through entrepreneurship education then it could act as a catalyst for the creation of new forms of for-profit businesses, i.e. in our metaphor starting from 'Point B' onward (or SWOMM approach) as depicted in Figure 1. For this reason, the following sections will describe the investigation around the combination of the discipline of 'entrepreneurship education' and 'education for sustainable development'.

Examples of innovations	Examples of resources
Analysis tools (e.g. Environmental Management Systems, Life-Cycle Analysis, auditing, etc)	(Hawken 1993; Fussler 1996; Weizäcker *et al.* 1998; Elkington 1999; Hawken *et al.* 1999)
Organisation learning for SD	(Azzone & Noci 1998; Senge *et al.* 1999; Laszlo & Laszlo 2002; Molnar & Mulvihill 2003)
Green technologies	(Fussler 1996; Weizäcker *et al.* 1998; Hawken *et al.* 1999)
Sustainable business models to achieve eco-efficiency and effectiveness (e.g. Natural Capitalism, Triple-Bottom-Line auditing, The Natural Step, etc)	(Hawken 1993; Weizäcker *et al.* 1998; Bradbury & Clair 1999; Elkington 1999; Hawken *et al.* 1999; Nattrass & Altomare 1999)
Green-entrepreneurship	(Anderson 1998; Issak 1998; Walley & Taylor 2002)

TABLE 1 – EXAMPLES OF INNOVATIONS IN BUSINESS

Literature investigation

This section describes three sets of literature review regarding to: 1) Government and UN strategies on sustainable development (SD) and education for sustainable development (ESD), 2) education for sustainable development (ESD) and 3) entrepreneurship education.

Government/UN strategies on Sustainable Development

Government and UN's literature focusing on SD and ESD - In total 42 literatures had been reviewed, including 8 UK governmental paper e.g. DEFRA (2003b), FCO (2005) and HM Government (2005); 33 United Nation's report, articles and web-text e.g. UNESCO (2004a); and 1 annual report from the World Business Council for Sustainable Development (WBCSD 2005).

Out of the 42 literatures reviewed only one (WBCSD 2005) articulated programmes and activities relating to 'entrepreneurship and sustainable development'. WBCSD perceive UN's aim of reducing world poverty by 50% before 2015 as providing opportunities for entrepreneurs to both create new business and meet societal goals. For example, WBCSD initiated 'Sustainable livelihoods' programme to develop dialogue among stakeholders as a means to develop guides to 'what works and what does not in poor communities' (WBCSD 2005, p. 11) and promote doing business for the poor (p. 15). WBCSD also initiated programmes to improve environmental management and social performance in SMEs (p. 28).

Four out of 42 literatures referred to strategies for entrepreneurship (and/or SMEs) on SD. UNESC-CSD (1998b) relates to 'green technology transfer' and noted that "SMEs need information on opportunities and requirements for technology transfer to developing countries and encourage contacts with potential partners through missions and other networking activities" (p. 5). UNESC-CSD (1998a) pointed out that SMEs should have "access to research and consultants who can assist in applying eco-efficiency in business strategies, planning and operations" (p. 11). UNESA-DSD (2004) describes the strategies and objectives set for Business and industrial sector (chapter 30, Agenda 21). It also articulated objectives to promote the practice of SD among entrepreneurs and also to increase the number of owner-managers adopting SD in established firms. And UNESCO (2004a) briefly referred to entrepreneurial initiatives and training as one of the ESD strategies for the private sector (p. 27)

Education for Sustainable Development (ESD)

In a systematic review, two databases (ABI/Inform and Web of Science) were used to search for relevant articles and used a number of 'string-words' within the search tool to scope and filter out irrelevant articles. The scope of this review was 'entrepreneurship and small-firms' and the root was 'education, tools and methods' and 'sustainable development'. 'Title analysis' and 'abstract analysis' had been conducted, a total of 63 articles were selected and reviewed.

In addition, this review also searched journals around the scope of education for sustainable development and business and entrepreneurship education within the journals of 'Business Strategy and the Environment' (selected 6), 'Environment, development and sustainability' (selected 1), 'European Environment' (selected 0), 'Sustainable Development' (3) selected and 'International Journal of Sustainability in Higher Education' (selected 6). In total, 16 articles were selected (two duplicates when combine with the above systematic search).

Thirty five out 77 (63+14) articles linked ESD with business and management education. The teaching approach found among these articles can be summarised in Table 2.

Pedagogy	Resources
Multiple pedagogy such as the use of lecture, game, discussion, speaker, video, presentation, inquiry and problem-based activity, case study, group projects and application of SD framework on case studies (e.g. 'ecological footprint', 'the natural step' analysis, 'triple-bottom-line audit' and 'the natural capitalism') with the emphasis on interdisciplinary, holistic, systemic thinking and action learning approach.	(deWit & van der Werf 1997; Bradbury 2003; Desjardins & Diedrich 2003; Pesonen 2003; Welsh & Murray 2003; Rohweder 2004; Roome 2005; Wheeler *et al.* 2005)
Critical thinking as a pedagogical approach to challenge values and norms of students in a systemic and holistic manner as a way to develop alternative visions for the practice of business and SD.	(Wheeler *et al.* 1999; Springett & Kearins 2001; Kearins & Springett 2003; Stablein 2003; Springett 2005; Springett & Kearins 2005; Wheeler *et al.* 2005)
Outdoor activities to understand the ecosystem	(Beard 1996)
Simulation games to tackle social and environmental issues, conduct life-cycle analysis, stakeholders and strategic thinking.	(Beard 1996; Galea 2001; Ramus 2003)
Exposure to different concepts of sustainable development through text.	(Cordano *et al.* 2003)
Scenario activities	(Martin 1982; Strong & Hoffman 1990; Burton *et al.* 1991; Nelson 1992b)
Multiple analytic tools e.g. stakeholders analysis, cross-culture awareness analysis, social and environmental audit, life-cycle analysis.	(Hailey 1998; Walck 2003; Marshall & Harry 2005)

TABLE 2 – SUMMARY OF ESD PEDAGOGY FOUND IN LITERATURE

In short, the described approaches towards ESD are based on the 'Point A to Point B' approach (see Figure 1). It is about understanding problems and/or issues and subsequently move the existing practice from 'Point A to Point B'. There are only eight empirical papers out of these 35 articles: descriptive data analysis (Holt 2003; Wheeler *et al.* 2005), content and database analysis (Coopey 2003), experimental research design (Martin 1982; Burton *et al.* 1991; Cordano *et al.* 2003) and case studies (Bradbury & Clair 1999; Rohweder 2004).

Within this review, only two out of 77 articles pointed out the need and idea to promote SD in entrepreneurship education (Adeoti 2000; Koch 2005). Adeoti (2000) promoted the integration of ESD and entrepreneurship education for the creation of green businesses in developing countries and Koch (2005) promoted a distance learning training for MBA students aiming to produce people who would act as 'ecopreneurs' and/or champions who break the barriers of sustainable innovation within a company or by starting their own business (it used online multimedia tools such as chat rooms, animation, video conference, reading material, interdisciplinary project).

And finally, the importance of environmental education and education for sustainable development were emphasised by a number of authors (Hayashi 1991; McLeish 1993; Beard 1996; Adeoti 2000; Springett & Kearins 2001; Cordano *et al.* 2003; Pesonen 2003; Rohweder 2004) however there are authors who point out the lack and the need for ESD in business and management school (Wheeler *et al.* 1999; Springett & Kearins 2001; Coopey 2003; Cordano *et al.* 2003; Rohweder 2004) and especially in Asian countries (except Japan) (Thomas 2005). Though, the growth of interest and integration of sustainable development into business and management curriculum and text books were noted in the recent paper (Marshall & Harry 2005; Roome 2005; Thomas 2005).

Entrepreneurship education

This review also employed a systematic approach but only used ABI/Inform as a search engine. The scope was 'entrepreneurship and small-firms' and the root was 'education, tools and methods'. A total of 69 articles were selected and reviewed.

Since the 1970s, entrepreneurship education became a critical intervention used by government as a way to enhance enterprise culture, entrepreneurship, to increase the number of business start-up and minimise failure rate (Bridge et al. (2003)). Regardless of substantial development and funding, this approach has attracted substantial criticism. For example, criticisms on its overemphasis on providing SMEs managerial and new business start-up skills, and lacks of learning elements to develop enterprising behaviour, skills and attributes (e.g. creativity, self-confidence, motivation). Criticisms of the adoption of traditional business and management pedagogy, and the tendency to over emphasise theory and conceptual thinking, teacher-centred teaching style and treat functional knowledge as an 'end' rather than a 'means' (e.g. Gibb (1993) and Hytti & O'Gorman (2004)). Other problems such as the lack of resource, overloaded collegial system, political infighting, lack of sufficient competence (both theoretical and practical) and heavy bureaucracy in departmental structures are also highlighted (e.g. McMullan & Long (1987) and Gibb (1993)).

The picture is also complicated by debates with regard to 'whether entrepreneurs are born or made' and 'whether entrepreneurs could really be taught in classroom' (e.g. David Birch (Aronsson 2004)). However, Gendron (2004) argues that debate or issue is no longer "whether entrepreneurship can or should be taught, but rather how to continuously improve its content and delivery to meet the needs of our current students" (p.302). This feeds into debates about the pattern of teaching approach for entrepreneurship education and these are summarised in Table 3.

Pedagogy	Resources
Holistic approach with the pedagogical style such as - learn by doing, learn from mistakes, learn from stakeholders' feedback and interaction, learn to deal with pressure, ambiguity and complexity, learn to find problems as well as design solutions, learn from discovery, learn from formal and informal	(Hills 1988; Gibb 1993; Hynes 1996; Henderson & Robertson 1999; Ibrahaim & Soufani 2002; Ladzani & Vuuren 2002)

environment and learn from multi-disciplinary perspective.	
Problem-base learning to deal with complexity, ambiguity and multi-functional roles.	(Sexton & Bowman 1984; McMullan & Long 1987; Ulrich & Cole 1987; Sexton & Bowman-Upton 1988; Plaschka & Welsch 1990)
Learn through apprenticeship	(Aronsson 2004; Gendron 2004)
Learn by doing, action learning, experiential learning, role-play and simulation.	(Ulrich & Cole 1987; Haines Jr. 1988; Nelson 1992a; Low *et al.* 1994; Porter 1994; Feldman 1995; Leitch & Harrison 1999; Hindle 2002; Gendron 2004; Taylor *et al.* 2004; Ulijn *et al.* 2004)
Competition	(Li *et al.* 2003)
Role-play, scenario, simulation and games.	(Haines Jr. 1988; Clouse 1990; Stumpf *et al.* 1991; Low *et al.* 1994; Mitchell & Chesteen 1995; Winch & McDonald 1999; Fiet 2001b; Fiet 2001a; Hindle 2002; Schwartz & Teach 2002; Theroux & Kilbane 2004; Ulijn *et al.* 2004)
Visioning, creativity and opportunity identification activities.	(Harris *et al.* 2000; Rae & Carswell 2000; Rae 2003; Detienne & Chandler 2004; Gendron 2004)
Learn from reflection or critical incidents	(Cope & Watts 2000; Rae & Carswell 2000; Cope 2003)
Multi-media case studies	(Robertson & Collins 2003; Theroux & Kilbane 2004)
Problem-base and/or goal orientated activities and, activity that leads to reflection, presentation and discussion.	(Sexton & Bowman-Upton 1988; Garavan & O'Cinneide 1994; Cope & Watts 2000; Lawless *et al.* 2000; Cope 2003; Rae 2003; Robertson & Collins 2003; Gendron 2004)

TABLE 3 - SUMMARY OF THE TEACHING APPROACH FOR ENTREPRENEURSHIP EDUCATION

Summary of literature investigation

Findings after reviewing 188 articles, reports and/or web-text:

- There is a lack of 'education for sustainable development' (ESD) in business and management schools (Wheeler *et al.* 1999; Springett & Kearins 2001; Rohweder 2004; Thomas 2005) (Coopey 2003; Cordano *et al.* 2003; DEFRA 2003a) especially in Asian countries (except Japan) (Thomas 2005)
- There is the lack of empirical research on ESD in 'Business and Management education' and 'entrepreneurship education'
- The majority of teaching approaches and content follow the 'Point A to Point B' approach and thus it lacks 'Point B' onward approach in ESD
- Only three out of 188 literatures articulated ideas to promote SD in entrepreneurship education and/or training programmes combining entrepreneurship education and education for sustainable development (Adeoti 2000; Koch 2005; WBCSD 2005)
- Entrepreneurship education may need to avoid traditional methods of teaching in order to enhance its effectiveness due to the criticism emphasised by practitioners and academics

Entrepreneurship education for sustainable development

Subsequent to the above review, a clear research gap was discovered in the academic arena and in the UN/UK governmental strategies with regard to the integration of 'entrepreneurship education' and 'education for sustainable development'. We argue, the benefit of such integration is therefore the promotion of the creation of new forms of for-profit businesses supporting the move to stage 4 in the model depicted in Figure 1. This integration means forming education and/or training where students or trainees will learn the know-how to set-up and start-up a business, know-how to run and manage such business and in addition, the know-how to identify and exploit business opportunities for profit by solving social and/or environmental issues (i.e. 'Point B' onward or 'SWOMM' approach).

Opportunity identification is about identifying opportunities from the existing social reality. This is about 'seeing' and 'thinking' laterally (creatively) to identify opportunities and subsequently 'thinking' logically to refine, exploit and develop opportunities into business venture. Detienne & Chandler (2004) point out that identifying opportunities for new businesses is one of the most important skills of successful entrepreneurs. Entrepreneurs are the individuals who have the necessary skills to exploit a market opportunity by bringing together the physical, human and intangible resources required to establish a new venture (Jones & Tilley 2003). For this reason, as a way to enhance practitioners or entrepreneurs ability to identify opportunities within the arena of sustainable development, the practice or knowledge of 'opportunity identification' could therefore be a key learning element to form the concept of 'Entrepreneurship education for Sustainable development' following the ideology of 'SWOMM' (or 'Point B' onward approach).

In addition, thinking styles is divided into vertical (logical) and lateral (creative) thinking (De Bono 1970; De Bono 1994; De Bono 1995; De Bono 1999; De Bono 2000). Majaro (1988) pointed out that out left brain deals with logic, reasoning, language, numeracy, analysis, linearity, digital and abstract. Right brain deals with rhythm, music, imagination, images, colour, shape recognition, daydreaming and general creativity (p. 61). De Bono (1970) and (1999) argued that these two types of thinking are complementary to each other. Smith *et al.* (1989) argued that just having the ability to generate ideas alone will not be the only skills towards the generation of innovation because ideas needs to be exploited and developed into actual innovation. And thus, we argue that lateral thinking performs the function of generating ideas and logical thinking for developing and transforming an idea into innovation (into reality). For this reason, the ability to use lateral and logical thinking has links with the practice of opportunity identification [i.e. identifying, developing and refining ideas (logical and lateral thinking)].

Hence, if 'entrepreneurship education for sustainable development' provides the training and learning of 'how' to be creative to identify opportunities within the arena of sustainable development and 'use' logical thinking to develop and exploit these opportunities, then the ideology of combining economic, social and environmental aspects (SD) within entrepreneurial activity will be introduced to entrepreneurs. For this reason, the authors propose that 'entrepreneurship education for sustainable development' will consist of learning elements of 'opportunity identification', 'thinking styles' (i.e. using logical and lateral thinking) and new business venture development within the arena of sustainable development (SDNBVD). These proposed elements follow the 'SWOMM' or 'Point B' onward approach described in the earlier sections. This will contribute to the creation of training programmes that will serve as a catalyst for the generation of for-profit green and/or social businesses that treat economic, social and environmental aspect as paramount in all our economic activity.

In the subsequent sections, a process model for educationists to develop or refocus, refine and integrate elements of sustainable development into an existing entrepreneurship education will be

described. This will use an example of a concept for training where the elements described above will be integrated into entrepreneurship.

The process

Entrepreneurship education is basically a 'macro-programme' that is constructed by a range of modules, sessions, activity and exercises (i.e. is constructed by a range of micro-units). Each 'micro-unit' is constructed by key learning elements (e.g. business start-up or management skills) and a set of teaching styles (e.g. lectures or role-play activities). Each key learning element and teaching style (i.e. the selected ingredients) has its own function, purposes and a set of assumptions because such selection of ingredients within an entrepreneurship programme reflects the programme designers'/leader's ideas, vision, purposes, goals and aims (i.e. their formula or recipe). If so, then every macro-programme represents a diverse set of assumptions, visions, purposes, goals and aims specifically related to their creator(s). For this reason, at the initial stage of a development or if we wish to regain focus or refine an existing programme, the identification of a shared vision, purposes, goals and aims within the team is required (Figure 2).

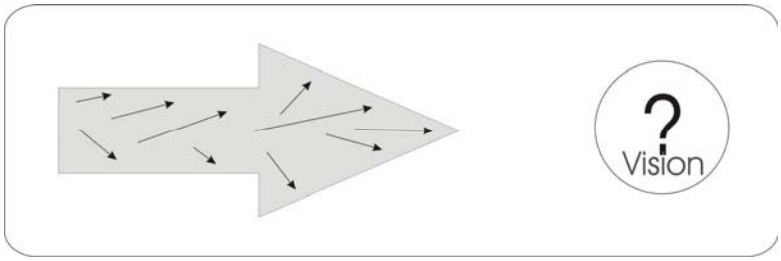

FIGURE 2 – IDENTIFY A SHARED VISION (ADAPTED FROM SENGE (1990, P. 252))

For the above reason, the development team should run a series of workshop to identify their visions, purposes, goals and aims e.g. ask ourselves: what are we doing? Who are we serving? What are we trying to do? What are the goals, aims, purposes? And if our goal is to develop entrepreneurs or train people to become one, then we should ask ourselves, 'if our entrepreneurship programme is a factory and our students/participants are the 'products' we produce, then:

- How do we want this 'product' to be?
- What attributes do we want this 'product' to have?
- What do we want this 'product' do?
- What image do we want this 'product' to reflect to society, government and the business community?
- Ask why to discover the reason (e.g. ask ourselves why with regard to our answer and follow this process five times).

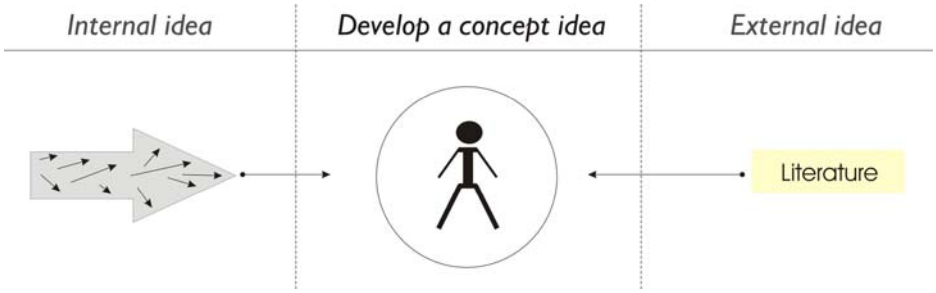

FIGURE 3 – DEVELOPING CONCEPT IDEA (I.E. A CONCEPT ENTREPRENEUR)

Throughout this workshop, the team would be encouraged to share their ideas, perceptions and assumptions and also to learn and/or exploit ideas within the existing literature (Figure 3). In short, this workshop begins by concentrating on ideas, imagination and exploration (i.e. lateral thinking – divergent process) and subsequently is followed by a workshop to identify all the key learning elements, attributes, mindset, behaviour and skills we want our concept entrepreneur (or product) to have (i.e. logical thinking – convergent process). This process is for example: (1) if I want this concept entrepreneur to have the ability to negotiate, then (2) our concept requires negotiation skills and therefore, (3) negotiation skill is a key learning element. Or (1) if I want this concept entrepreneur to have the ability to exploit opportunities within the arena of sustainable development, then (2) our concept requires opportunity identification skills and therefore, (3) opportunity identification skills is a key learning element (Figure 4).

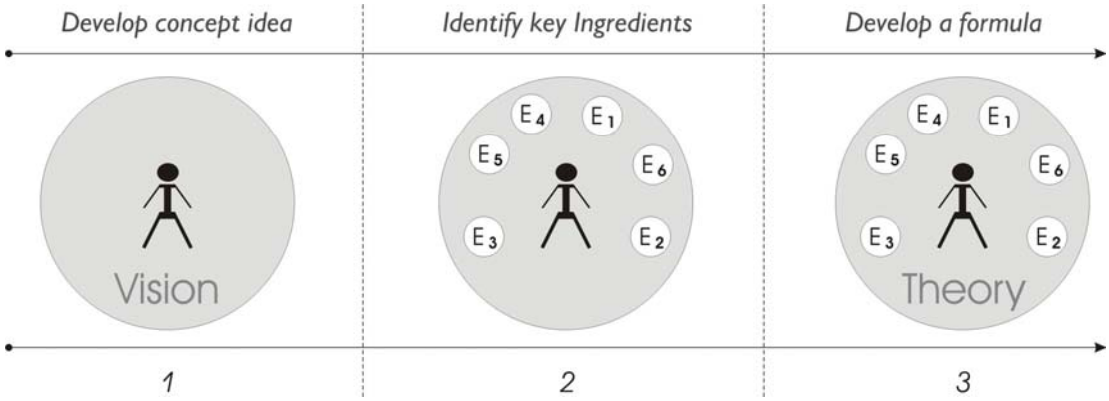

FIGURE 4 – IDENTIFY THE KEY LEARNING ELEMENTS BY REFLECTING ON THE SHARED VISION TO DEVELOP A FORMULA FOR THE PRODUCT (I.E. CONCEPT ENTREPRENEUR)

Subsequent to the identification of key learning elements, the team should reflect on their existing programme (i.e. their existing formula) and identify the elements that are overlapped (i.e. already exist), missing (i.e. new elements) and/or not relevant with regard to their new formula (Figure 5). After the previously described tasks, the team should own a shared vision and acknowledge a range of key learning elements they ought to have within their new or refined entrepreneurship programme (i.e. macro-programme) to facilitate the development of their concept entrepreneur (i.e. students/participants). Subsequent to the above tasks, the team could begin the refinement and development of their existing macro-programme (four further tasks).

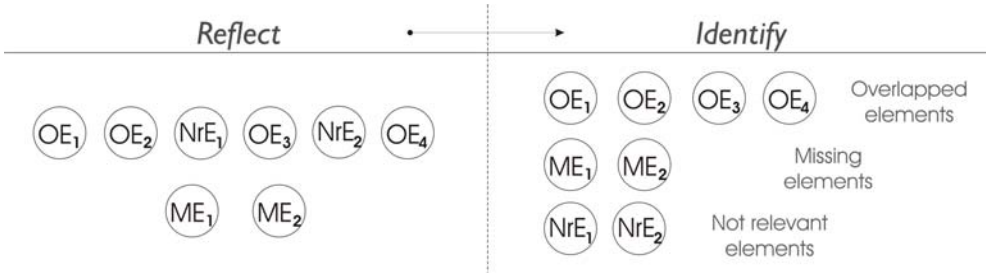

FIGURE 5 – REFLECT ON THE EXISTING PROGRAMME AND IDENTIFY THE ELEMENTS THAT ARE OVERLAPPED (OE), MISSING (ME) AND/OR NOT RELEVANT (NRE)

Task 1 – In order to continuously evaluate, develop and improve a programme, a feedback system is required. For short-term analysis and evaluation, tools such as questionnaire (for students to evaluate their experience, learning and training) and students' reflection report (with regard to their learning) can be adopted. And for long term evaluation, the team could setup a website specifically

designed for their graduates where it offers them a space to network, advertise and share best-practice (i.e. network). However, those who wish to exploit such website will be expected to offer feedback to the team with regard to their development and reflection on their learning as a way to monitor long term changes and effectiveness of the training programme.

Task 2 – Subsequent to the above task, the refinement on the overlapped elements (OEs) could begin (see Figure 6). At this stage, the team should select a number of ideas reflecting 'enterprising teaching methods/style' (see review on entrepreneurship education) to form the basis of their idea for refinement (OEs) (stages 1-3 in Figure 6). This means, every OEs are designed according to the appropriate mode of teaching entrepreneurs (stage 4 in Figure 6) and therefore quality of teaching and learning enhance. For example (adapted from Ulijn *et al.* (2004))**:**

- Key learning elements (overlapped element) – negotiation and communication skills
- Teaching approach – role-play and simulation
- Design specification – this micro-unit would be designed to teach negotiation and communication skills in the forms of role-play and simulation
- The outcome – an activity where two groups will be created within the class; whereby the first group represents a new-firm in need of investment; and the second group represents the venture capitalist; each group receives information with regard to their role, aim and situation; then each group would work in separate areas to design their negotiation strategies; subsequent to such work, each group would select their own negotiator (2-3) to negotiate the case within the classroom (i.e. 30 minutes time limit); the negotiator would be ask to reflect on their experience and will then follow by group discussion to conclude this session
- The learning outcome – negotiation skills, communication skills and team working skills

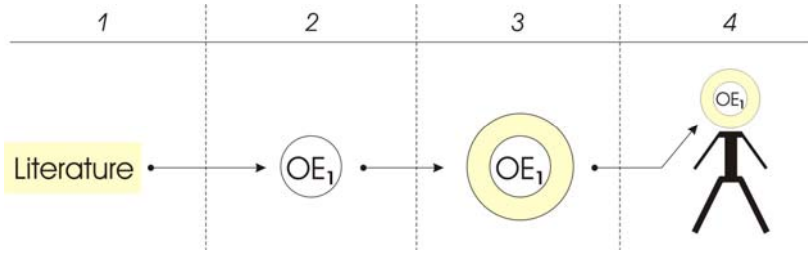

FIGURE 6 – REFINING OVERLAPPED ELEMENTS (OES)

Run this process to refine all the other overlapped elements (OEs) and pilot-test them in classrooms (Figure 6).

Task 3 – Here the team begin their development on the missing elements (MEs). The team should select a number of ideas reflecting 'enterprising teaching methods/style' (see review on entrepreneurship education) to form the basis of their idea for such development (stages 1-3 in Figure 7). This means, all MEs are designed according to the appropriate mode of teaching entrepreneurs (stage 4 in Figure 7) and therefore quality of teaching and learning enhance. For example:

- Key learning element (new element or missing element) – opportunity identification in the arena of sustainable development
- Teaching approach – role-play, scenario and presentation
- Design specification – this micro-unit would be designed to teach opportunity identification in the arena of sustainable development in the forms of role-play, scenario and presentation
- The outcome – an activity where students would play the role of being a member within Richard Branson's (Virgin) team; this member (i.e. their role) has reputation for being

creative, unconventional and unpredictable; students (or this member) would be told that their 'boss' (Richard Branson) wants to expand his business portfolio into a range of unconventional sector particularly to develop for-profit business concept by solving social and/or environmental issues; students are then presented with a range of social and environmental issues and are also asked to brainstorm their own perception of social and environmental issues; then each students are expected to identify a range opportunities, generate business concepts for their boss and present such to the board (i.e. the class); students would be given credit for being unconventional and creative towards their ideas and presentation

- The learning outcome – opportunity identification skills, exploitation of opportunities in the arena of sustainable development, business concept development, for-profit social and/or green business concept development, lateral thinking (brainstorming, identifying opportunities and develop business concept), logical thinking (selecting and refining business concept) and presentation skills.

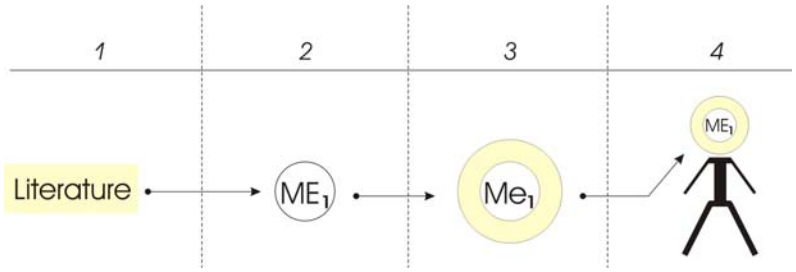

FIGURE 7 – REFINING MISSING ELEMENTS (MES)

Run this process to refine all the missing elements (MEs) and pilot-test them in classrooms (Figure 7).

Task 4 – Once all the 'micro-units' are refined and/or developed, the design team should begin to refine and transform their existing programme into a new 'macro-programme'. This is achieved by integrating the missing elements (or the new elements) into the programme and eliminating elements that are not relevant (Figure 8). In addition, within this process of evolution, the team should continuously try out different structures, ideas and designs to monitor changes in effectiveness using the data generated by the feedback systems (e.g. questionnaire, students' reflection report and the website). In short, their task is to transform an un-integrated 'macro-programme' into a fully integrated, interdisciplinary and coherent programme of 'entrepreneurship education for sustainable development' (Figure 9).

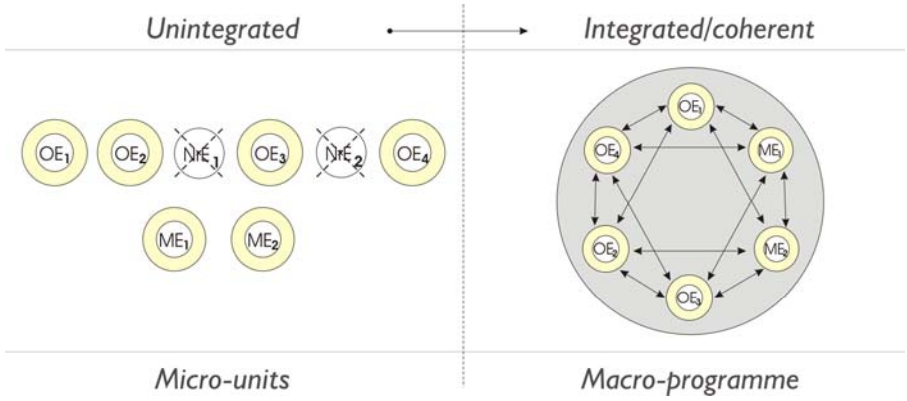

FIGURE 8 – TRANSFORMING THE UN-INTEGRATED MACRO-PROGRAMME INTO AN INTEGRATED MACRO-PROGRAMME

Conclusion

To conclude this paper, a reflection of this process model will be briefly described. The 'macro-programme' designed by the team is constituted with a set of 'micro-units' (Figure 9). Each of these 'micro-units' reflects a set of key learning elements and ideas borrowed from the existing literature as a way to enhance the quality of our teaching approach (Figure 9). And each key learning element represents one of the crucial ingredients which form our overall concept of an 'entrepreneur' we aimed to produce. This concept is a representation of a shared vision owned by the programme designers and the team who runs the 'macro-programme' (Figure 9). And thus, this concept is embedded with assumptions, visions, aims, purposes and goals. In short, this concept guides us, gives us direction and energy to move towards our destiny. This concept will be continuously developed, refined, changed and improved by our internal influences (e.g. Kolb's learning loop: experience, reflection, theorise and take action (Osland *et al.* 2001); values; perceptions; imagination; etc) and external influences (i.e. literature, media, society, networks (Taylor & Pandza 2003), etc) (Figure 9).

The authors propose that 'entrepreneurship education for sustainable development' will consist of the learning elements of 'opportunity identification', 'thinking styles' (i.e. using logical and lateral thinking) and new business venture development within the arena of sustainable development (SDNBVD). These proposed elements follow the 'SWOMM' or 'Point B' onward approach described in the earlier sections. This will contribute to the creation of training programmes that will serve as a catalyst for the generation of for-profit green and/or social businesses that treat economic, social and environmental aspect as paramount in all our economic activities.

This paper provided an example of 'how' these learning elements could be integrated into entrepreneurship education. This example illustrated that learning outcomes from 'education for sustainable development' can and do crossover to the learning elements that are already used in mainstream entrepreneurship education (e.g. creativity skills, opportunity identification skills, business development and presentation skills). In short, this means interdisciplinary and multiple learning opportunities are feasible and achievable for the integration of 'entrepreneurship education' and 'education for sustainable development'. This new integration can be therefore called 'entrepreneurship education for sustainable development'.

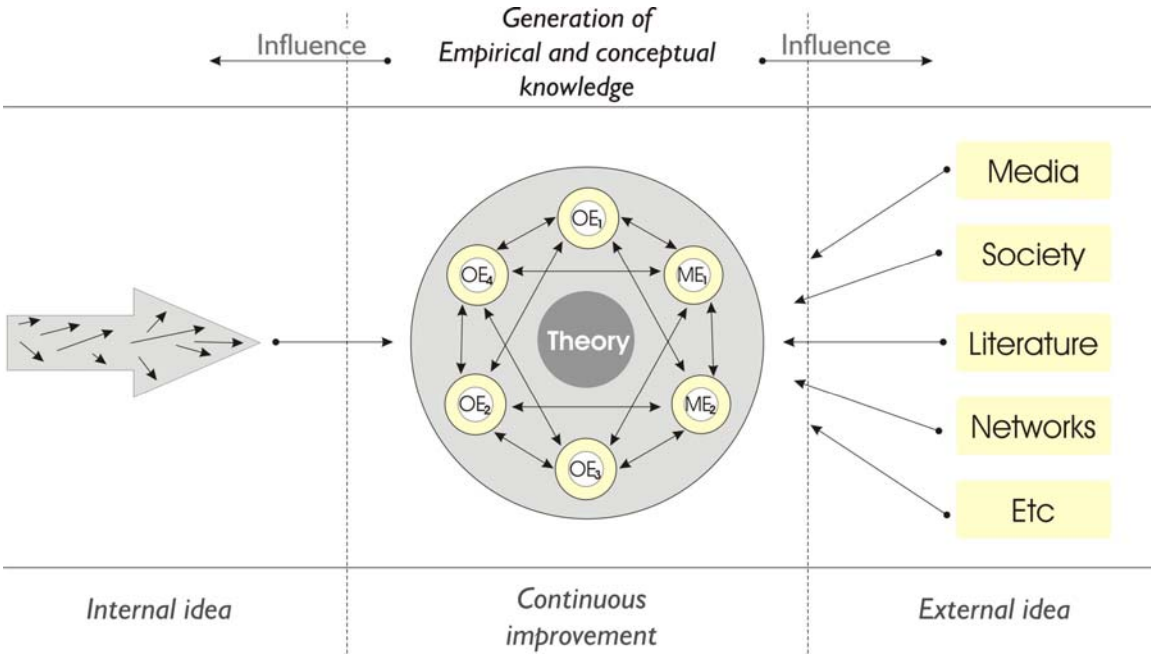

FIGURE 9 – THE OVERALL PROCESS OF THE CONTINUOUS IMPROVEMENT

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