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Sustainability: A Paradigmatic Shift in Entrepreneurship Education

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T*his article proposes that sustainability represents a paradigmatic shift from traditional perspectives in entrepreneurship education. This “call to action” argues that it is imperative for entrepreneurship scholars and practitioners to add sustainability to academic curricula and consulting support activities. The evolutionary development of entrepreneurship from the traditional profit-oriented perspective to sustainable entrepreneurship is described. A case study of an academic institution, which has successfully incorporated sustainability principles into its curriculum, is provided. This article is among the first that details the importance of a paradigmatic shift because “business as usual” is no longer effective in the twenty-first century.*

Keywords: sustainability; sustainable entrepreneurship; paradigm shifts; entrepreneurship education

Businesses are experiencing a global sustainability revolution, especially as concerns about natural environment degradation, shrinking biodiversity, and resource insufficiency keep increasing. These resources cannot sustain current economic development. As suggested originally in *Limits to Growth* (Meadows, Meadows, Randers, and Behrens, 1972), “business as usual” ultimately will lead to the collapse of most living systems and thus economic ruin. Companies are moving away from a traditional profit and shareholder wealth maximization model to one in which environmental management and social costs are equally important (Edwards, 2005; Savitz, 2006). Whether referred to as the “Sustainability Revolution” (Edwards, 2005) or the “Necessary Revolution” (Senge, Smith, Kruschwitz, Laur, and Schley, 2008), this movement signifies a dramatic paradigmatic shift, not unlike the revolutionary changes brought on by quantum physics or relativity, the Industrial Revolution, and the introduction of the World Wide Web.

This perception of the need for change is not limited to commercial enterprises. For example, applicants to universities and colleges and existing students demonstrate increasing levels of sensitivity to social and environmental issues. The current generation of students appears to be the most environmentally aware cohort ever, and they consider jobs that just pay well less attractive than jobs that they find inter-

esting. They also believe that in order for human civilization to survive the next century, lifestyles must change radically (Pew Research Center, 2010; Mueller and Neck, 2010). Accordingly, “prospective students are more likely to be attracted to universities or colleges that can help them cultivate their interests” (Forum for the Future, 2008).

Amid all of this change, the field of entrepreneurship has been slow to adapt. This may be partly because most literature assumes economic motives as the sole purpose of new start-ups (Kirzner, 1973). However, some evidence suggests that economic gain may not be the only motive for all entrepreneurs. Newbert (2003) found that economic motives, such as wealth creation, were generally not the prominent motive of entrepreneurs, who appear to have both economic and ethical motivations for their actions. Moreover, Wiklund, Davidsson, and Delmar (2003) suggest that “non-economic” concerns may be more important than anticipated financial gains to small business managers when they consider expanding their firms.

There is a small, but increasing, number of entrepreneurs who are not limiting their ventures to reach just an economic or social or environmental goal but deliberately strike to have a balance among the three forms of capital: human, environmental, and economic. They are called sustainable entrepreneurs. This concept, sustainable entrepreneurship, is relatively new. Despite the emergence of social entrepreneurship (Short, Moss, and Lumpkin, 2009; Austin, Stevensen, and Weiskillern, 2006), sustainable entrepreneurship is more encompassing in addressing economic and ecologic issues (Tilley and Young, 2009). Increased interest is evidenced by the recent special issue on sustainable entrepreneurship in one of the top entrepreneurship academic journals, *Journal of Business Venturing*. But, in practice, few entrepreneurship textbooks and entrepreneurial support organizations include sustainability as a priority in the start-up or growth stages. In fact, sustainable entrepreneurship seldom appears in the conference programs of the most prestigious organizations focused on entrepreneurship education.

In this article we describe the evolutionary development of sustainable entrepreneurship from its roots in economic theory to contemporary perspectives. We explain why sustainable entrepreneurship is different from eco-preneurship

and social entrepreneurship, and we portend that we are in the midst of a paradigmatic shift in the way we view entrepreneurial thinking. We present a case study of an academic institution that has incorporated sustainability principles into its curriculum, and we express a “call to action” for entrepreneurship educators and practitioners to abandon traditional practices and accept a new paradigm for practicing entrepreneurship.

Paradigm Shifts

In the late 1960s, Switzerland had dominated the world watch market for 60 years, with more than 65 percent of unit sales and 80 percent of profits. Yet by 1980, its market share had shrunk to 10 percent, and profits dropped to less than 20 percent. What happened? A profound paradigm shift confronted Switzerland, changing the fundamental rules of watchmaking, because the electronic quartz watch came to dominate mechanical mechanism. The Swiss had created both mechanisms, but because electronic quartz was a new idea, Swiss manufacturers rejected its production in 1967 (Barker, 1993). The Swiss watch industry is not the only example of such a mistake. Nations have done it; various corporations and organizations have done it; and even more individuals have failed to recognize the changing rules in the face of a paradigm shift. Furthermore, such shifts constantly arise, as the current change in relation to environmental systems exemplifies.

The complex social, environmental, and economic problems that mark modern society have existed for a long time but are getting worse. Poverty, environmental degradation, economic instability, unemployment, and the like persist, despite significant efforts to eradicate them (Deming, 1994; Pizarro, 2011). Richmond (2005) argues that the gap exists because people retain outdated ways of thinking, communicating, and learning. In particular, systems are central to the way people live and work, as well as to the economy, education, government, and environment. Yet despite the existence of such a nonlinear world, responses to problems tend to be linear. In contrast, businesses should perceive the world and their surroundings in new, more sophisticated ways—a recommendation that management scholars have been making for at least forty years. Management must change to be effective in an environment in which businesses are embedded in complex sociocultural, economic, and political systems (Ackoff, 1994; Deming, 1994; Senge, 1990; Senge, et al., 2008; Meadows, 2008).

Theoretical Background

Paradigms are systems of thought. These shared sets of assumptions determine how people perceive the world because they allow for the development of expectations about what is likely to occur. However, when information

falls outside an existing paradigm, people find it hard to accept. The inability or refusal to see beyond current modes of thinking may be the greatest barrier to paradigm shifts (Harrison, 1994; Kuhn, 1962, 1970, 1996; Smith, 1975). That is, people tend to personalize and invest in a prevailing community belief-perception model (paradigm), or “mental model” (Senge, 1990), then feel threatened by anything or anyone that tries to change or dislodge it (Kuhn, 1970; Barker, 1993).

In *The Structure of Scientific Revolution*, Kuhn proposes a model to illustrate how science evolves through three stages to produce a new paradigm. Scientists begin by working in specific problems associated with an existing paradigm, which Kuhn calls “puzzles.” This puzzle-solving state is normal in science, but not all problems can be solved by an existing paradigm, and new problems continually arise that the paradigm is unable to resolve. These problems trigger discomfort in the field and signal the shift to a crisis state by the scientific community. Scientists realize that they cannot solve the new problems using their existing paradigm, so they begin to propose innovative solutions that, if successful, eventually replace the existing paradigm (Kuhn, 1962, 1970, 1996).

Kuhn’s work is very important and provides a foundation for extending understanding of the concept of paradigms, as presented by Joel Barker in *Paradigms: The Business of Discovering the Future*. By building on Kuhn’s model, Barker’s model facilitates strategic efforts to anticipate and shape the future of any field endeavor (Meridith, 1993). We apply Barker’s paradigm concepts to illustrate the arrival of a new paradigm in the entrepreneurship field, namely, sustainable entrepreneurship.

Barker’s Explanation of Paradigm Shifts

Barker (1993, p. 32) defines a paradigm as “a set of rules and regulations (written or unwritten) that does two things: (1) it establishes or defines boundaries; and (2) it tells you how to behave inside the boundaries in order to be successful,” with success defined as the “ability to solve problems, problems from trivial to profound.” The question that remains is to determine when new paradigms arise.

Barker explains new paradigms in line with Kuhn’s theory: “Every paradigm will, in the process of finding new problems, uncover problems it cannot solve. And those unsolvable problems provide the catalyst for triggering the paradigm shift” (Barker, 1993, p. 52). Each paradigm thus identifies a signal for the next paradigm. However, proponents of an existing paradigm continue to believe that they eventually will find a solution to all problems because the paradigm has been successful in the past. All they need is more time or resources. For example, one might postulate such reasoning underlies the national country government decisions to allocate economic stimulus packages for recovery, even though

the modern economic system appears to be functioning under an inadequate, out-of-date paradigm.

A paradigm shift encourages innovation and new rules of the game for an institution, group of institutions, or field. By making these changes, the entities can solve crucial problems, because they have changed the central paradigms. Barker (1993) also distinguishes two groups who set the course for a paradigm shift: (1) outsiders who are new to a field and are more likely to question rules and change an existing paradigm, and (2) insiders who have paradigm-shifting capabilities or potential, such as mavericks, tinkers, or other types of creative participants in the field.

Outsiders do not understand the prevailing paradigm and its subtleties fully. For example, in entrepreneurship, outsiders might change the rules by focusing on goals other than profit. One popular and early example involves Anita Roddick, who founded The Body Shop in 1976 to support herself and her two daughters; she regarded entrepreneurship as a means of survival. The Body Shop opened offering organic and sustainably produced beauty products just as Europe was starting to go “green.” Roddick believed that businesses have the power to do good, so the initial mission statement of the company established its overriding commitment, “To dedicate our business to the pursuit of social and environmental change.” The store and its products help communicate human rights and environmental issues. The Body Shop has grown into a massive international entity with more than 2,200 stores in fifty-five different countries (The Body Shop International PLC, 2011). Companies that similarly challenged the prevailing paradigm from outside include, but are not limited to, Patagonia, REI, Tesla Motors, Kiva, and Qurrent.

Another group of outsiders consists of future leaders—who currently are well represented among university students. The Forum for the Future surveyed 54,240 young respondents (21 years and younger) in 2008, who were living in the United Kingdom and applying to universities or colleges in 2007–2008. These respondents were asked about how they saw themselves compared with their parents’ generation, what they thought would make them happy, and what they expected from the future. Most of them (85%) expressed their belief that it was likely or very likely that human civilization would survive into the next century—but 76 percent warned that to ensure this survival, lifestyles would need to change radically. Furthermore, 88 percent of these young respondents thought the government had the most responsibility for creating necessary changes, followed by individual citizens and then businesses, media, and the education system. Yet 91 percent believed that these organizations were doing very little to help. This evidence implies that students already have begun to adopt a new paradigm. They are aware of the problem and understand that it

requires behavioral changes in the form of a paradigm shift.

Practitioners of a prevailing paradigm, or insiders, also can recognize problems, understand that the present paradigm cannot solve them, and thus lead the charge to change the paradigms (Barker, 1993). In 1994, Ray Anderson, founder and chairman of Interface, challenged his then 21-year-old company to adopt a bold vision, one that required new thinking and a new business model. The resulting commitment to sustainability has generated significant results for Interface, across three key areas: carbon footprint reduction, product innovation, and culture change. For example, innovation has helped ensure Interface’s sustainable success, and its commitment to its Mission Zero program has fostered an entrepreneurial spirit among innovative thinkers, who are encouraged to imagine unique solutions. Its innovations range from an inventive modular carpet to sustainable, low-impact products.

Such changes to the rules of the game are not foreshadowed by trends. Instead, rule changes create new trends or alter existing ones (Barker, 1993). Consider B Corporations, American businesses that rely on a new sustainable business model. By shifting the emphasis of business from shareholder value to stakeholder value, these companies commit to ensuring that employees, consumers, and communities, including the environment, all benefit from their economic activity. As of September 2011, 449 B Corporations earning \$2.18 billion in revenues existed in 27 states and 54 industries. The rules clearly have changed. As entrepreneurship educators, our imperative is to acknowledge sustainable entrepreneurship as an emerging field that it is here to stay. In the next section, we describe several evolutionary developments in the field of entrepreneurship from the economic motive to social entrepreneurship to sustainable entrepreneurship.

The Evolution of the Sustainable Entrepreneurship Concept

The relative newness of the idea of sustainable entrepreneurship makes its research agenda difficult to define. The topic has been influenced strongly by environmental business management, another relatively new phenomenon (Schaper, 2005). Both topics remain less well known, less researched, and less understood than entrepreneurship, in general. Most writing pertaining to greener management focuses mainly on greening existing business organizations (Schaper, 2005). In particular, this section focuses on the evolution of the term “entrepreneurship” and its different forms, which eventually led to the formation of the subconcept “sustainable entrepreneurship.”

Entrepreneurship’s Economic Link

Entrepreneurial behavior and its meaning have been greatly shaped by the institutions and environment within which

entrepreneurs operate. In its earliest incarnation, the term “entrepreneurship” was influenced strongly by economists (e.g., the writings of Richard Chantillon, J. B. Say, Adam Smith, David Ricardo, John Stuart Mill, and Joseph A. Schumpeter). Due to this early economic dominant influence, entrepreneurship has come to occupy a primary role in the theory of economic development (Herbert & Link, 1989). Accordingly, it also assumes that entrepreneurship is focused only on economic returns.

Signals Beyond Profit. Various organizations are recognizing that the three systems—social, economic, and environmental—inevitably converge, such that they are transitioning gradually toward achieving sustainability. This recognition reflects not only pressure from government agencies (e.g., regulations) and societal stakeholders (e.g., customers, employees, investors, activists), who are increasingly asking questions and calling for action on a spectrum of issues, but also the realization that it simply is good economics. For example, “Hewlett-Packard (HP) says that in 2007, over \$12 billion of new business depended in part on HP’s answers to questions about the company’s environmental and social performance” (Esty & Winston, 2009, p.9). Furthermore, Walmart will “ask” suppliers to create more environmental friendly products (Esty & Winston, 2009, p.7). However, some authors still argue companies engage in social responsibility solely to earn profits (Reich, 2008). For example, Dow Chemical reduces carbon emissions to lower its energy costs, and Walmart adopts “green” packaging for its fruits and vegetables because the transparent plastics made from corn sugars are cheaper than petroleum-based packaging.

In other publications, the discussion of corporate social responsibility centers on whether it is just a fad. The key challenge may be encouraging a critical mass of smaller companies to adopt corporate social responsibility (Luetkenhorst, 2004), though some researchers argue that it already has been incorporated into mainstream business practices (Godfrey and Hatch, 2007; Porter and Kramer, 2006). In practice, the implementation of sustainable business measures into existing organizational cultures tends to be an arduous and lengthy process (Freimann et al., 2005), such that many environmental conservation measures never move beyond daily operating procedures (Freimann and Schwedes, 2000; Freimann and Walther, 2002).

Promoting sustainability among start-up businesses might be promising, particularly because new businesses have yet to develop their organizational culture (Freimann et al., 2005). However, research on sustainability in the start-up process is limited, despite the introduction of some half a million new businesses each month in the United States (Leebaert, 2006). Freimann et al. (2005) propose the start-up stage as the most sensible starting point for environmental

management.

In addition, the most prevalent focus in entrepreneurship research continues to be the pursuit of financial performance, and yet a typology of entrepreneurship-dependent variables supports a broader scope that includes economic, environmental, and social values (Cohen, Smith, & Mitchell, 2006). Regardless of its scope, the field remains difficult to study and analyze critically (Schaper, 2005).

Social Entrepreneurship

Social entrepreneurship originates from the nonprofit sector (Dees, 1998; Mort, Weerawardena, and Carnegie, 2003) as a response to diminishing government involvement in the economy and society (Den Hond & De Bakker, 2007). Accordingly, Dorado (2006) suggests there is no way to achieve consensus about what constitutes a social entrepreneur. However, most social entrepreneurship literature focuses on two themes: analysis and the locus of activity (i.e., individual, organizational or interorganizational). At the individual level, definitions of entrepreneurship tend to focus on the founder (Mair & Marti, 2006), who often appears as a “change maker” (Van Slyke & Newman, 2006). At the interorganizational level, definitions deal with the processes of value creation, including opportunity recognition, adopting a mission to create social value, and engaging in continuous innovation, adaptation, and learning (Anderson & Dees, 2006; Dees, 1998; Roberts & Woods, 2005). Other attempts at providing the multiple definitions of social entrepreneurship are evident in Cukier, Trenholm, Carl, and Gekas (2011) and Welsh and Krueger (2009).

Another question involves where social entrepreneurship occurs. For example, Mair and Marti (2006) assert that it encompasses efforts to tackle social problems and catalyze social transformation, regardless of whether the actor is a for-profit or nonprofit organization. Austin, Stevenson, and Weiskillern (2006) apply the PCDO (people, context, deal, opportunity) framework developed in Sahlman (1996) to social entrepreneurship to evaluate the similarities and differences with the commercial entrepreneurship framework. Short, Moss and Lumpkin (2009) provide a comprehensive analysis of extant scholarship in this field and suggest opportunities for potential avenues for future research.

Eco-preneurship

The combination of two words, ecological (eco) and entrepreneurship, produces the term “eco-preneurship,” which implies the initiation of a very innovative company that supplies environmentally friendly products and services (Schaltegger, 2005). Most related research has worked on improving understanding of how and why existing firms might become more eco-preneurial. Little research has considered the start-up process or eco-preneurship as a source

of business opportunities—even though it was cited as a potential profit source in a 1971 *Harvard Business Review* article (Quinn, 1971). This early article claimed that ecology could provide profitable new markets for business expansion, rather than simply being a drain on economic activity. Elkington and Burke (1987) also have argued that innovative business ideas designed to improve the environment could offer a basis for new business prospects, overlooked by mainstream firms. By the mid-1990s, researchers began introducing terms such as “environmental entrepreneur,” “green entrepreneur,” “eco-entrepreneur,” and “ecopreneur” (Bennett, 1991; Berle, 1991; Blue, 1990). More recent authors have provided more detailed analyses (e.g., Isaak, 2005; Kyro, 2001; Larson, 2000), focusing on environmentally friendly innovations in processes, products, and services and stressing the potentially for-profit nature of environmental entrepreneurship (Schaltegger & Wagner, 2008).

An ideal form of eco-entrepreneurship implies a (usually) deliberate strategy to transform the sector into one that operates with sustainability as its primary goal. However, a merely “greenwashing” business seems to have had only a marginal effect on moving society toward sustainability (Fisher & Schot, 1993). Only 20 percent of North American and European companies can be described as proactive in their commitment to improve environmental performance in alignment with sustainable development objectives (World Resources Institute, 2002).

Schaper (2005) argues that making society sustainable requires jump-starting the process of spreading truly green businesses by offering incentives to make all new businesses environmentally friendly from their initial start-up phases. This important recommendation seems viable, yet it lacks any recognition of social elements. For example, an organic, environmentally friendly farm still might pay its workers sweatshop salaries. Thus arise several important questions: Is there a universal set of sustainable principles that define the start-up process? Are sustainable principles applicable to all industries? Does a structure exist to support the start-up process for sustainable businesses?

Sustainable Entrepreneurship

Less-than-radical approaches cannot deal with all three dimensions of sustainability, namely, social, environment, and economic, simultaneously. The concept of sustainable entrepreneurship offers an alternative perspective that represents an emerging field of research in its own right. However, existing research is fragmented and lacks a coherent theoretical framework. Shepherd and Patzelt (2011) define sustainable entrepreneurship as “focused on the preservation of nature, life support, and community in the pursuit of perceived opportunities to bring into existence future products, processes, and services for gain, where gain is broadly con-

strued to include economic and non-economic gains to individuals, the economy, and society.” They surmise that the lack of convergence on a definition to include multiple theoretical perspectives is beneficial as the field emerges. Cohen and Winn (2007, p. 35; also see Venkataraman, 1997, p. 125) define it as the process to evaluating “how opportunities to bring into existence ‘future’ goods and services are discovered, created and exploited, by whom and with what economic psychological, social and environmental consequences.” Shane and Venkataraman (2000, p. 218) define sustainability entrepreneurship as “the process of discovering, evaluating, and exploiting economic opportunities that are present in market failures, which detract from sustainability, including those that are environmentally relevant.” Regardless of its definition, sustainable entrepreneurship must include three forms of capital: *social capital* supports the achievement of social change, with appropriate rewards; *economic capital* enhances the quality of life by increasing the productive capacity of organizations and individuals in society (Holliday, Schmidheiny and Watts, 2002); and *environmental capital* provides opportunities for economic development, creativity, and innovation.

Eco-entrepreneurship is linked most strongly to the pursuit of profitable entrepreneurial opportunities, whereas social entrepreneurship orients more toward nonprofit activities and welfare purposes. Although their historic trajectories differ, the underlying motivations for both activities are very similar, such that they are likely to be united in the future (Schaltegger and Wagner, 2008). For example, activists are putting pressure on farms that grow organic but are not paying living wages to employees. Cohen and Winn (2007) and Dean and McMullen (2002) thus argue that specific market failures provide the underlying root cause for entrepreneurial activities aimed at both social objectives and environmental improvements.

Sustainable entrepreneurship represents a complex issue to understand and manage and remains difficult to measure and research (Schaper, 2005). Despite these challenges, it constitutes an important and growing business area that demands further research attention. Figure 1 highlights the evolution of sustainable entrepreneurship. The first graphic indicates traditional entrepreneurship, which was profit oriented. Social and environmental practices existed but they were not part of the company strategy and were completely voluntary, in the form of philanthropy. In addition, under this model, if an organization pays its taxes, it meets its societal commitment. The next graphic illustrates societal and environmental practices. It started as a profit-oriented activity, particularly with the environmental dimension. Only few organizations actually have incorporated the practices as part of their strategy. It was more of a sideline activity. Most sustainable organizations are in this stage. Some of the reasons

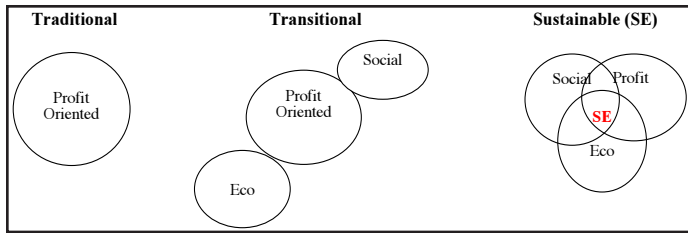


Figure 1: The Evolution of Entrepreneurship

why they do not fully incorporate sustainable practices include a lack of understanding of the benefits, not knowing how to do it, costs, and the voluntary nature of the activity. Therefore, it is not implemented universally and businesses operate more cheaply in countries with few environmental and social regulations. The last graphic illustrates the ultimate state of an organization when the three dimensions of sustainability are incorporated into its strategy and day-to-day operations. At present, most organizations fall into the traditional entrepreneurship model.

Hall, Daneke, and Lenox (2010) recognize the growing awareness of the need for transformation and discuss concerns about the Panacea Hypothesis—that entrepreneurship is the magic bullet to becoming a more sustainable system. Claiming that “sustainability has become the mainstay of corporate strategy,” the authors note the paucity of entrepreneurship research, although the number of journal publications over time is increasing. They also differentiate research in social entrepreneurship as being “complementary” but not identical.

The need for more research in the start-up process is evident by the number of new firms that emerge and close every year. Many scholars have recognized that risk is embedded in the start-up process. For example, the process of starting a new business is loaded with difficulty and failure (Reynolds and Miller, 1992; Van de Ven, 1992; Venkataraman et al., 1990). It appears to consist of problems and difficulties that are unforeseen at the outset and are often uncontrollable once these activities are undertaken. It is complicated, chaotic, and prone to failure (Bygrave, 1989; Cooper and Gascon, 1992; Longworth, 1991). On the other hand, there is evidence that sustainable practices can do the following: (1) help show the way to increase productivity while reducing resources use; (2) make it easier to “fix” environmental components and processes from the outset (Isaak, 2005); (3) broaden the range of opportunities for entrepreneurs; (4) provide numerous niches that enterprising individuals and firms can successfully identify and service; (5) develop new products and services; and (6) reconfigure existing business models, and practices (Schaper, 2005).

Although few focus on the start-up or nascent entrepreneur, there are several notable exceptions. Hockerts and Wustenhagen (2010) propose a model of how start-ups and

existing firms engage in sustainable entrepreneurship. In their popular textbook about new venture creations, Timmons and Spinelli (2009) identify sustainability, defined as concerns for environment, community and society, as the foundation of the model of the entrepreneurial process. Likewise, they raise sustainability issues in several sections of the business plan outline, although there is no detailed guidance about how to develop a sustainability plan. Still, the inclusion of a separate chapter on sustainability is more than most other entrepreneurship textbooks, which typically include a chapter on social entrepreneurship at the end of the book. Hitchcock and Williard (2008) provide a very useful practice guide for developing a sustainability plan regardless of whether it is a start-up or incumbent.

An interesting empirical study of start-up entrepreneurs and start-up business advisors in Germany identifies several challenges start-ups encounter in adopting environmental management practices (Schick, Marxen, and Freiman, 2002). Inhibitors are information and workload that prevent the entrepreneur from addressing strategic over operational issues. Also, easy access to information about sustainability business practices is nonexistent. Moreover, most business advisers are ill equipped to provide sustainability business counseling. They associate sustainability with increased costs rather than cost savings and view it as involving products not processes. Lastly, advisers were not prepared to make environmental issues part of their start-up consulting services.

The previous summary of research and practitioner-oriented materials on sustainable entrepreneurship shows a paucity of knowledge on a subject that represents a revolutionary shift in paradigms regarding the way firms do business. In the following section, we provide a case study of an academic institution that has incorporated sustainability principles into its curriculum.

Case Study: College of the Atlantic

With its ever-evolving standards and the multiple stakeholder perspectives, sustainability has become an engine for innovation and entrepreneurship. Quite simply, if you look at a problem using one perspective, you are going to only see one solution. If you look at it from multiple perspectives, you are going to see opportunities you never expected. You will redefine the value equation.

What would this look like in an entrepreneurship-focused academic setting? College of the Atlantic (COA), in Bar Harbor, Maine, gives us some insight into this new approach. The college is itself a roughly forty-year-old entrepreneurship experiment. COA was created by a group of academic rebels who sought to remake higher education. Among other innovations, they banished departments and created a transdisciplinary curriculum focused on highlighting the connections between traditionally siloed academic disciplines to spark

innovation and to solve problems from multiple perspectives. In addition, the students were focused on learning these skills in an environment that encouraged engagement with the world beyond the campus boundaries to help them to become change agents after graduation. In this context, the school became one of six undergraduate institutions with a Sustainable Business Program in 2008. The size of the school, approximately 350 students, has allowed the program to redefine the boundaries of entrepreneurship education quickly by preparing students to succeed financially and to pursue their dreams of creating social and environmental change effectively.

COA's Sustainable Business Program both tears down traditional walls and expands the entrepreneurship discipline. It is guided by the following core principles:

- Leveraging sustainable business practices as a means of building financial, environmental and social capital.
- Using of sustainability as a new driver of value creation and innovation.
- Combining the study of both for-profit (traditional entrepreneurship) and nonprofit (social entrepreneurship) business models and practices to promote cross-pollination of ideas, operations, and best practices.
- Including experiential elements, such as student projects, consulting for collaborating companies, internships, and venture creation.
- Drawing on knowledge from the multiple intellectual disciplines represented by COA faculty.

The culmination of the program is COA's sustainable enterprise incubator, called the "Hatchery." In the Hatchery students from across the campus apply entrepreneurial principles to start sustainable ventures in diverse areas such as community planning, food systems, anthropology, urban agriculture, international development, bio-fuels and the arts. A quick case study on the bio-fuel company, Gourmet Butanol, shows how academic interests from across the campus came together to spark sustainable innovation.

The team of students creating Gourmet Butanol came together in a social entrepreneurship course that was focused on identifying problems and devising entrepreneurial solutions to improve life on Mount Desert Island, where COA is located. Students on the team had radically different interests. One was obsessed by solid waste reduction. Another was interested in community organizing and actively working on a project studying the use of cord wood as an alternative to oil in rural communities. The third was a chemist, specifically interested in fermentation. For a few weeks, the group struggled to find common ground between these seemingly disparate interests. The innovative common ground they found was using food waste to create butanol

through the process of fermentation, which could potentially solve a myriad of problems the community faced. It could reduce solid waste issues by turning food waste into both compost and a valuable fuel that was a direct substitute for gasoline, thereby reducing carbon emissions, closing the nutrient cycle, and creating economic development in this traditionally depressed region. In addition, by using food waste instead of the traditional feedstock of corn or other agricultural crops, their process had the potential to cut the cost of production more than 50 percent. These innovative solutions were a direct result of taking a problem apart with a multitude of perspectives and struggling through reassembly with students speaking fundamentally different academic languages. To assemble this, the students had to not only be open to embracing others' views, they also had to be eager to seek them out, and able to voice their own.

While this idea (fondly referred to by the team members as an "octopus") was born in a social entrepreneurship course, it expanded and reached its tentacles into other courses, academic disciplines, and the administration. The entire team took Gourmet Butanol into a venture planning course, conducted customer research, and wrote a full business plan. One student took an independent study with a chemistry professor to develop the protocol for making the butanol. In fact, in a faculty meeting it was the chemistry professor who announced that the student team was competing in a business plan competition. In addition, they wrote and received a NASA Space Grant and start-up funding from the Sustainable Business Program to purchase equipment. Another student was paid by the administration to explore funding for a test plant to produce butanol to reduce COA's carbon emissions and allow the school to eliminate fossil fuels. In addition, the students reached across campus to engage other members of the student body. To continue advancing the project, Gourmet Butanol has been accepted into the sustainable enterprise incubator, the Hatchery, where they will create a rapid prototype and further refine their business plan.

Engaging these multiple stakeholders and their perspectives continues to shape the students' venture. It has sometimes created frustrating roadblocks and continues to make the enterprise stronger. Without engagement across the curriculum and the merger of social and traditional entrepreneurship, these ideas may never have been more than a highly regarded classroom presentation.

Conclusion

This article conveys the urgency regarding the "sustainability revolution" and the relative complacency exhibited by scholars and practitioners in entrepreneurship education. Gladwin, Kennelly and Krause (1995, p. 874) repeated Gareth Morgan's (1980) warning that "organizational scientists were

“imprisoned” by a constricted range of assumptions about the ontological status of social reality and human nature and needed a more cosmopolitan outlook in theorizing in order to advance the field.” Now, more than ever, entrepreneurship educators need to remove their intellectual straightjackets that allow them to cling comfortably to outdated “mental models” (Senge, 1990) and “industry recipes” (Spender, 1989). Larson (2011) is among the first to publish a text that incorporates elements of sustainability and entrepreneurship. In a newer edition of a popular entrepreneurship textbook, Spinelli and Adams (2012) have added a section on “sustainability and impact” to their business plan framework. However, the field is fertile for opportunities to advance sustainable entrepreneurship as the new “business as usual” (Amatucci and Grimm, 2011).

The start-up phase is the ideal stage for incorporating sustainability capabilities into the business model and organizational culture. Doing so can create a competitive advantage that results in long-term survival and maximizing value. Start-

ups cannot afford not to pay more attention to sustainability practices. Thus, it is important that academics in entrepreneurship education include sustainability in the entrepreneurship curriculum, and that consultants and counselors in entrepreneurial support organizations begin to incorporate sustainability topics in their business advising services. The case study of the College of the Atlantic provides an example of one school’s successful effort.

It is time to accept that a paradigmatic shift is occurring in our discipline and that the need for a new perspective in entrepreneurship education could not be greater. Entrepreneurship educators need to practice what we teach regarding opportunity recognition, and recognize that current curricula, based on the old economic model, are not adequately preparing students for the future. We hope this article will not only raise awareness about the need for change in the field, but also serve as a catalyst for innovations in both curricula and practices that facilitate this change.

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