Educating the Next Wave of Entrepreneurs

Unlocking entrepreneurial capabilities to meet the global challenges of the 21st Century

A Report of the Global Education Initiative

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Foreword

The world is experiencing one of the most extraordinary periods in history. The power equation continues shifting across countries and regions, while rapid changes unfold in the marketplace reshaping both the political landscape and the interactions between governments and businesses. The financial crisis, combined with rising inflation and the consequent slowdown in global demand, has engendered significant insecurity about the outlook of the world economy, and increased anxiety about its potential implications on the accomplishment of the Millenium Development Goals by 2015. However, it is in difficult times when the power of collaboration bears fruit, helping us better understand the challenges we face and encouraging us to unleash our imagination and capitalize on the opportunities ahead.

Entrepreneurship and education are two such extraordinary opportunities that need to be leveraged and interconnected if we are to develop the human capital required for building the societies of the future. Entrepreneurship is the engine fuelling innovation, employment generation and economic growth. Only by creating an environment where entrepreneurship can prosper and where entrepreneurs can try new ideas and empower others can we ensure that many of the world's issues will not go unaddressed. As highlighted in the inaugural 2008 Summit on the Global Agenda in Dubai, entrepreneurship is also one of the core principles of the World Economic Forum. The motto of our organization is "entrepreneurship in the global public interest", calling for entrepreneurs to put their ideas to the service of the global community.

Equally important is the power that education has in developing the skills that generate an entrepreneurial mindset and in preparing future leaders for solving more complex, interlinked and fast-changing problems. Education needs to come back to the top of the priorities of governments and the private sector and be seen as the fundamental mechanism for attaining sustainable economic development and societal progress. More than ever, the world needs effective global leaders and stronger educational systems that prepare the current and future generations of entrepreneurs, workers, teachers, managers and individuals with the skills needed to succeed and help others.

Recognizing these opportunities, the Global Education Initiative (GEI) of the World Economic Forum in the context of its mission to help create sustainable, scalable and relevant education systems through multistakeholder partnerships, has embarked on a process to advance Entrepreneurship Education as one of the key drivers of sustained social development and economic recovery. The full report consolidates existing knowledge and good practices in entrepreneurship education around three focus areas that cover the lifelong learning process of an individual: youth, higher education and social inclusion. It also outlines specific approaches that are needed for each one of these areas, as well as opportunities, challenges and practical recommendations for key stakeholders.

We thank all contributors of this report for their thought leadership and for helping us serve once again as a platform for dialogue and reflection among governments, businesses and civil society. We specifically thank the GEI Steering Board members AMD, Cisco, Goldman Sachs, Intel and Microsoft for their leadership and stewardship of this report, and all of the GEI Steering Board members for their many years of unconditional support of the Initiative and the mission of the World Economic Forum.

Klaus Schwab
Founder and Executive Chairman
World Economic Forum

Preface

As members of the Steering Board of the Global Education Initiative (GEI), our mission is to support the efforts of the World Economic Forum to advance education globally. We strongly believe education is the engine that fuels personal development, and societal and economic progress. As such, it is a topic that demands action, not only from academia and governments, but also from the private sector, the donor community, and civil society.

Through the GEI model of multistakeholder partnerships, the Forum and its partners have mobilized more than US$ 100 million in resource support and made an impact with more than 1.8 million teachers and students in Jordan, Egypt, Palestine, Rwanda and the State of Rajasthan in India. This approach has proven successful, and has demonstrated that it is through collaboration that we can achieve and scale the development and delivery of effective education programmes.

We also believe that entrepreneurship results in increased innovation and sustained economic growth. We see enormous potential in investing in entrepreneurship education in order to nurture talent and develop the next wave of leaders and innovators who will not only create jobs and value for society, but also empower others to create a better future.

In 2008, our organizations funded a workstream within the GEI dedicated to the advancement of entrepreneurship education. Our main objectives within this workstream are to bring together different stakeholders from the public and private sectors, as well as practitioners, experts and members of academia and civil society, to share existing knowledge and good practices, raise awareness and work together to design innovative new approaches for entrepreneurship education.

We believe entrepreneurial skills, attitudes and behaviours can be learned, and that exposure to entrepreneurship education throughout an individual's lifelong learning path, starting from youth and continuing through adulthood into higher education – as well as reaching out to those economically or socially excluded – is imperative. This report addresses entrepreneurship education from this broader perspective, likely the first time it has been viewed in such a comprehensive manner.
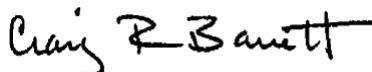
We are pleased to present this report as a first step in gathering current evidence on entrepreneurship education. We hope it serves as a foundation for further discussion, action, and localization of recommendations in countries and regions around the world.

Lloyd C. Blankfein
Chairman and Chief Executive Officer
The Goldman Sachs Group Inc.

Dirk Meyer
President and Chief Executive Officer
AMD

Craig R. Barrett
Chairman of the Board
Intel Corporation

John T. Chambers
Chairman and Chief Executive Officer
Cisco

Craig Mundie
Chief Research and Strategy Officer
Microsoft Corporation

Introduction

KAREN E. WILSON, GV Partners
ANA SEPULVEDA, World Economic Forum

The World Economic Forum, as an independent, international organization committed to improving the state of the world, engages leaders in partnerships to shape global, regional and industry agendas. Incorporated as a Swiss not-for-profit foundation, the World Economic Forum has achieved a record of accomplishments in advancing progress on key issues of global concern. Under the motto "entrepreneurship in the global public interest", the Forum aims to align economic progress and social development when addressing the complex challenges of our time.

The vision for the World Economic Forum is threefold. It aims to be the foremost organization building and energizing leading global communities; the creative force shaping global, regional and industry agendas; and the catalyst of choice for its communities when undertaking global initiatives to improve the state the world. To carry out its mission, the World Economic Forum engages world leaders from the business, public, academic and NGO communities, in strategic initiatives to address key challenges on the global agenda.

In 2003, at the Forum's Annual Meeting in Davos, the Global Education Initiative (GEI) was launched. During its six years of existence, the GEI has made significant progress in its overall objective of raising awareness and supporting the implementation of relevant, sustainable and scalable national education sector plans on a global level through catalyzing Multistakeholder Partnerships for Education (MSPE). The Jordan, Rajasthan, Palestine and Egypt Education Initiatives are examples of how the World Economic Forum and its constituents have built multistakeholder partnerships to develop effective and scalable models that introduce innovative approaches to education, particularly through the use of technology.

In 2007, the GEI made two key accomplishments by shifting from a country level focus to a global approach. Building on the success of the country initiatives mentioned above, the GEI launched two new major

workstreams with global and far-reaching scalable implications: a global partnership with UNESCO, and the Global Education Alliance. The first workstream aims at codifying, socializing and catalysing the use of MSPE for all education stakeholders. The second workstream aims at implementing MSPE models to support the Education For All Fast Track Initiative (a US$ 1.2 billion global coalition of education bilateral country donors), whose objective is to implement the United Nations Education for All Goals (EFA) and the Millennium Development Goals (MDGs).

With 2007 marking the midway point of a 15-year global effort to achieve EFA and the MDGs for education, it was clear that significant challenges remained in the areas of education inclusion, quality, literacy, capacity, skills development and financing. The need to develop new and innovative models to address these challenges is urgent, and while education is one of the most important foundations for economic development, entrepreneurship is a major driver of innovation and economic growth. Entrepreneurship education plays an essential role in shaping attitudes, skills and culture – from the primary level up. It can be the catalyst needed to help develop the new, innovative models necessary to achieve EFA and the MDGs for education.

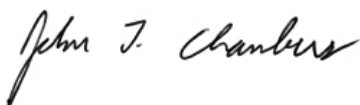With this reflection, in 2007, during its meeting in Seattle, the Steering Board of the Global Education Initiative highlighted entrepreneurship education as one of the issues requiring greater global awareness and action. While entrepreneurship education is rapidly growing and drawing the attention of policy-makers, universities and companies alike, there is still very little research and documentation about models that are working and how they can be scaled. The Steering Board agreed that there was tremendous potential for the Forum to act as a catalyst in this field given its expertise in convening world leaders to discuss global issues, and its proven record of success in establishing and developing partnerships as demonstrated through the Global Education Initiative. At the same time, national governments, international organizations such as UNESCO, OECD, UNDP, the

European Commission, civil society groups and others were increasingly advocating for the importance of entrepreneurship and the role that education plays in igniting it.

In parallel, the World Economic Forum was also forming a network of the most innovative leaders in specific topic areas to discuss existing knowledge on key issues and integrate it into a global collaboration and decision-making process. The Global Agenda Councils (GAC), represent transformational innovation in global governance, and mark a major milestone in the Forum's evolution towards becoming the "integrator, manager and disseminator of the best knowledge available in the world." One of the 68 Councils that were created was on Entrepreneurship, as it represents the key driving force for innovation, creating jobs and reactivating the global economy. The Global Agenda Council on Entrepreneurship, chaired by Angel Cabrera, President, Thunderbird School of Global Management, identified entrepreneurship education as one of the seven key dimensions[1] that needs to be analysed for advancing entrepreneurship globally.

With all these developments in entrepreneurship education, the timing was clearly right for initiating a global effort in this area. That is why the Steering Board of the Global Education Initiative decided to launch a global workstream focused on entrepreneurship education that would build the evidence base, raise awareness and bring together stakeholders from the public and private sectors to design innovative approaches for the development and delivery of effective education programmes and activities for entrepreneurship. This report is the first step in pulling together the current evidence base and providing a foundation for further discussion and action.

Objectives

Entrepreneurship education is critical for developing entrepreneurial skills, attitudes and behaviours that are the basis for economic growth. Access and exposure to entrepreneurship within educational systems at all levels are important as they are the outreach to target audiences outside of traditional educational systems. In both

respects, the role that technology can play in delivering entrepreneurship education is essential. With this new workstream, the Global Education Initiative aims to:

1) Highlight and raise awareness of the importance of entrepreneurship education in spurring economic growth and achieving the Millennium Development Goals
2) Consolidate existing knowledge and good practices in entrepreneurship education around the world to enable the development of innovative new tools, approaches and delivery methods
3) Provide recommendations to governments, academia, the private sector and other actors on the development and delivery of effective education programmes for entrepreneurship
4) Launch a process in which the recommendations can be discussed on the global, regional, national and local levels and implemented with the involvement of key stakeholders

Structure and Scope of Report

Given the various forms of entrepreneurship both across and within regions and countries around the world, this report looks at three specific types of entrepreneurship: youth (with a focus on disadvantaged youth), higher education (with a focus on growth/opportunity entrepreneurship) and social inclusion, outlining the differing types of education approaches needed for each. In each of these areas, the report identifies opportunities and challenges, highlights existing entrepreneurship education tools and good practices and develops recommendations for multistakeholder support of the development and delivery of effective educational programmes for entrepreneurship.

While the first two forms of entrepreneurship education are self-explanatory, the third is more complex. Entrepreneurship for social inclusion seeks growth by allowing more people – especially marginalized ones such as the very poor, women in many contexts, minorities, disabled and disadvantaged – to engage actively in productive economic activities.

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1   Other dimensions studied at the GAC on Entrepreneurship are: entrepreneurial culture, regulatory framework and the economics of entrepreneurship, venture capital, sustaining innovation in mature organizations, entrepreneurship of women, and family entrepreneurship.

Educational Lifespan

Formal Education:

| Youth Primary/Secondary Education | Higher Education | Further/ Continuing Education |

Informal Education:

Social Inclusion

Life long learning

There are commonalities about entrepreneurship education across all three of the focus areas. However, there are also distinct differences that merit this particular segmentation. It is important to look at all of these key communities to develop a comprehensive view of the landscape and recommendations for next steps. Each of the three types of entrepreneurship exist in most countries across the world, although some are more dominant in certain regions than others. Addressing entrepreneurship education requires working with existing education systems to incorporate the necessary changes as well as launching new initiatives outside of current structures.

The purpose of the report is not to identify and highlight all practices, but to provide some examples. Because the field is moving and growing extremely rapidly, it is difficult to create a "catalogue" of all practice. Nor is the report a data-driven research piece. Rather, it collects the views and examples to date on these topics to be used as a platform for further discussion.

Can entrepreneurship be taught or, more importantly, learned? This is an age-old debate. It is clear that education plays an essential role in shaping attitudes, skills and culture – from the primary level up. Entrepreneurship education provides a mix of experiential learning, skill building and, most importantly, mindset shift. Certainly, the earlier and more widespread the exposure to entrepreneurship and innovation, the more likely students will become entrepreneurial, in one form or another, at some stage in their lives.

" Most of what you hear about entrepreneurship is all wrong. It's not magic; it's not mysterious; and it has nothing to do with genes. It's a discipline and, like any discipline, it can be learned."

Peter F. Drucker

The three core chapters of the report focus on different segments of the educational lifespan or system from youth to higher education to those socially excluded. Each chapter highlights opportunities, challenges and current practices. However, there are many common approaches and key success factors across the chapters. Outlined below are some of the key areas in terms of **what**, **how**, **where** and **who** to teach entrepreneurship, to maximize the learning of the participants.

What

- Enhancing entrepreneurial behaviours and mindsets
- Building self confidence, self efficacy and leadership
- Creativity, innovation and ability to think "out of the box" to solve problems
- Managing complexity and unpredictability
- Basic business and financial skills: "business literacy"
- Opportunity identification
- How to build, finance and grow ventures
- Developing negotiation skills
- Building relationships, networks, social capital

How

- Interactive, learning centred pedagogies
- Multi-disciplinary programs and projects Case studies, games, simulations, business plan competitions, etc.
- Extensive use of visuals, digital tools and multimedia
- Learning by doing/hands-on
- Experiential learning/labs (trial & error)
- Projects, internships with start-ups
- Mentoring and coaching
- Interactions with entrepreneurs

STUDENTS & ENTREPRENEURS

Who

- Students
- Teachers and school administrators
- Professors, trainers
- Business People and leaders in other sectors
- Entrepreneurs
- Mentors, coaches, advisors

Where

- Formal school systems (primary, secondary, tertiary):
    - At all levels
    - Across all disciplines
    - Compulsory and elective courses

- Informal systems (after school and other)
    - Local schools, training institutions
    - Community centers, NGOs, government agencies, banks, etc.
    - Workplace-based training programs
    - Life long learning

Executive Summary

KAREN E. WILSON, GV Partners

Entrepreneurship has never been more important than it is today in this time of financial crisis. At the same time, society faces massive global challenges that extend well beyond the economy. Innovation and entrepreneurship provide a way forward for solving the global challenges of the 21st century, building sustainable development, creating jobs, generating renewed economic growth and advancing human welfare.

When we speak about entrepreneurship, we are defining it in the broadest terms and in all forms – entrepreneurial people in large companies, in the public sector, in academia and, of course, those who launch and grow new companies. Now more than ever, we need innovation, new solutions, creative approaches and new ways of operating. We are in uncharted territory and need people in all sectors and at all ages who can "think out of the box" to identify and pursue opportunities in new and paradigm-changing ways.

" My greatest challenge has been to change the mindset of people. We see things the way our minds have instructed our eyes to see."

Muhammad Yunus, Managing Director, Grameen Bank

Entrepreneurship education can be a societal change agent, a great enabler in all sectors. Not everyone needs to become an entrepreneur to benefit from entrepreneurship education, but all members of society need to be more entrepreneurial. The public sector, private sector, academia and non-profit sectors all have roles to play in facilitating the development of effective ecosystems that encourage and support the creation of innovative new ventures. We need to create the types of environments that are conducive to encouraging entrepreneurial ways of thinking and behaving.

Much has been written about the impact of entrepreneurship on economic growth. If we are to attain the Millennium Development Goals of reducing poverty, we must develop human capital in all countries and societies, in remote regions as well as major cites, and in all sectors, to address both the opportunities and major challenges we face in the world. While the contexts around the world vary dramatically, entrepreneurship education, in its various forms, can equip people to proactively pursue those opportunities available to them based on their local environments and cultures. We have seen a number of "waves" in entrepreneurship education, starting a century ago, developing in phases and now expanding exponentially. By making entrepreneurship education available to young people and adults alike, we are preparing the next wave of entrepreneurs to enable them to lead and shape our institutions, businesses and local communities.

" What we need is an entrepreneurial society in which innovation and entrepreneurship are normal, steady and continual."

Peter F. Drucker

The time to act is now. There is tremendous movement on the entrepreneurship front in countries around the world. As evidenced by the numerous recent reports and initiatives focused on entrepreneurship education, there is also sufficient buy-in for action. While many of the reports point in common directions, most initiatives have been at the local, regional or national level. With the current momentum, now is the time to take these efforts to the next level – to move from words to action as well as to address entrepreneurship education in a comprehensive manner at the global level. The World Economic Forum's effort in this area can be the catalyst to bring together actors who have been involved in numerous initiatives around the world, encourage a bias for action and build concrete next steps for implementation.

Purpose of the Report

This report consolidates existing knowledge and practices in entrepreneurship education around the world to facilitate sharing and scaling as well as to enable the development of innovative new tools, approaches and delivery methods. It provides a landscape of entrepreneurship education practices across youth, higher education and social inclusion, providing not only examples but also recommendations across these segments for various stakeholders.

The report has been developed by a core working group of authors and through consultation with the World Economic Forum's Entrepreneurship Education Technical Advisory Group (TAG) and other experts. The Steering Board of the World Economic Forum's Global Education Initiative (GEI) has played a critical role in launching, supporting and providing guidance on the project as it has evolved during the course of 2008. In addition, several of the Global Agenda Councils (GAC) of the World Economic Forum (specifically those on Technology and Education and Entrepreneurship) have highlighted the importance of entrepreneurship education.

" Only by letting thousands and millions of entrepreneurs try new ideas, to innovate, to create businesses that put those ideas to work in a competitive and open way, only by doing those things are we going to be able to tackle some of the world's big problems."

Angel Cabrera, President,
Thunderbird School of Global Management,
Chair Global Agenda Council on Entrepreneurship

Why this report? Why now? More importantly, why should you read it?

Our goals are to raise awareness about the importance of entrepreneurship education for developing the skills to solve global challenges, increase understanding about current approaches, build acceptance of entrepreneurship's rightful role in education and provide a platform for action to take the necessary next steps for mainstreaming entrepreneurship in education.

The report is geared towards high-level policy-makers and leaders from the private and academic sectors. By working together, they can develop high-impact solutions through multistakeholder partnerships for embedding entrepreneurship education within their countries and regions.

Entrepreneurship is a global phenomenon. The future, to an even greater degree than the past, will be driven by innovation and entrepreneurship. It is time to more adequately develop entrepreneurial skills, attitudes and behaviours in our school systems as well as outside formal school systems, to reach across all ages as part of a lifelong learning process. As we have seen through initiatives such as Global Entrepreneurship Week[2], which took place for the first time in November 2008 and will continue on an annual basis, activities and initiatives around the world are growing rapidly.

If there have been so many recent reports, how does this one differ?

First, in this report we use a broad definition of entrepreneurship to include the pursuit of opportunities, whether they involve start-ups, spin-outs, entrepreneurial activities in larger organizations (private or public), or social ventures.

Second, this is the first time entrepreneurship education has been considered in such a systematic manner throughout the lifelong learning process of an individual – starting from youth, continuing into higher education and including informal education systems that reach out to those socially excluded. Entrepreneurship has taken many different forms in communities across the world. There have been many successful initiatives focused on

enhancing entrepreneurial skills and training in developing and developed countries, as well as programmes targeted towards youth. However, as yet, there has been little attempt to draw on these findings in a systematic way to move beyond classic stereotypes and develop a wider understanding of the key issues involved in implementing entrepreneurship education in different countries and communities.

Third, we have attempted to address this topic on a global basis. The report is not a catalogue of initiatives around the world; rather, it seeks to give a flavour of the types of activities that exist and to serve as a basis for further discussion and research. The report is intended to provide the foundation and starting point for a series of further discussions and the development of locally relevant action plans in regions across the world.

Definitions and Views of Entrepreneurship

A key theme surfacing throughout the development of the report is the varying views and definitions of entrepreneurship around the world.

In a number of countries around the world, the role of entrepreneurs is unclear and can even be viewed negatively. In some countries, entrepreneurship is not often rewarded but rather penalized. The multidimensional benefits entrepreneurship provides to society need to be illuminated.

In addition, there is a need for clarity on the definitions of entrepreneurship. There are many working definitions, but for the purposes of the report, entrepreneurship is defined as:

"The pursuit of opportunity beyond the resources you currently control."
(Stevenson, 1983, 1985; Stevenson and Jarillo, 1991).

Entrepreneurship is a process that results in creativity, innovation and growth. Innovative entrepreneurs come in all shapes and forms; the benefits are not limited to start-ups, innovative ventures or new jobs. Entrepreneurship

refers to an individual's ability to turn ideas into action and is therefore a key competence for all, helping young people to be more creative and self-confident in whatever they undertake (EC, 2008).

As H.M. Queen Rania Al Abdullah of the Hashemite Kingdom of Jordan stated at the Global Education Initiative private meeting in Davos 2007, society needs to encourage people to "practice at believing the unbelievable, using imagination, courage and tapping into the inner entrepreneur."

There are many other words often used as substitutes for entrepreneurship including enterprise, innovation, small business, growth companies, and so on. To fully capture and understand the entrepreneurship phenomenon, we need to take a broad and inclusive view; otherwise we will miss important components and trends in this rapidly growing movement.

In addition, there are many forms and meanings of the word entrepreneurship:

Entrepreneur	Individual
Entrepreneurship	Process
Entrepreneurial	Attitudes, skills and behaviours
Entrepreneurial Ecosystem	Role of society

Overview of Recommendations

The recommendations in the report are divided into two categories. First, there is the "Call for Action" for policy-makers, with the goal of raising awareness about the importance of entrepreneurship education and the need to address it through multistakeholder partnerships. Second, there is a menu of more specific action items in the recommendations sections for all key stakeholders, including those from the public, private, academic and non-profit sectors.

While the report lays out a variety of steps that can be taken to develop and embed entrepreneurship education in formal and informal education systems, the authors and members of the World Economic Forum's Technical Advisory Group (TAG) for Entrepreneurship Education encourage public and private sector leaders to take a revolutionary, not an evolutionary, approach. Entrepreneurship education is needed to build entrepreneurial human capital for the society of the future. We need to encourage a more entrepreneurial culture and develop the necessary skills, attitudes and behaviours to prepare young people and others to pursue entrepreneurial opportunities. We also need more entrepreneurial institutions and societies.

The danger of not doing so is that we maintain the status quo, which in this time of economic crisis, we simply cannot afford. It is time for rethinking systems and taking bold and decisive actions that will benefit society today and in the longer term. We need to leverage the power of innovation and creativity to guide our way to a healthy and prosperous future. Entrepreneurship empowers people, in all societies and at all levels, to take their own destinies into their hands. It creates opportunities that contribute to economic growth, and personal and professional development.

Call to Action

Entrepreneurship education is essential for developing the human capital necessary for the society of the future. It is not enough to add entrepreneurship on the perimeter – it needs to be central to the way education operates. Educational institutions, at all levels (primary, secondary and higher education) need to adopt 21st century methods and tools to develop the appropriate learning environment for encouraging creativity, innovation and the ability to "think out of the box" to solve problems. This requires a fundamental rethinking of educational systems, both formal and informal. Also in need of rethinking are the way teachers or educators are trained, how examination systems function and the way rewards, recognition and incentives are given.

Academia needs to work with ministries, the private sector and other stakeholders to rethink the educational systems in their countries to develop entrepreneurial societies. Embedding entrepreneurship and innovation, cross-disciplinary approaches and interactive teaching methods all require new models, frameworks and paradigms. It is time to rethink the old systems and have a fundamental "rebooting" of the educational process. Incremental change in education is not adequate in today's rapidly changing society. We need schools, colleges and universities that are entrepreneurial in their approach to preparing individuals for the future.

Build the Entrepreneurial Ecosystem

Entrepreneurship thrives in ecosystems in which multiple stakeholders play key roles (see Figure below). Academic institutions are central in shaping young people's attitudes, skills and behaviours. However, actors outside of the education systems play an increasingly critical role in working with formal and informal educational programmes as well as reaching out to underserved and socially excluded targets groups. This requires collaboration and multistakeholder partnerships.

First and foremost, entrepreneurship education requires close cooperation between academia and business. Past barriers to academic collaboration with business need to be broken down and outreach both encouraged and supported. As demonstrated later in the report through the case studies, companies and entrepreneurs play instrumental roles in promoting entrepreneurial education by providing knowledge, expertise, mentoring, social capital and financial support. In addition, businesses with an entrepreneurial culture contribute directly to the entrepreneurial education process by providing employees with the opportunity to cultivate entrepreneurial skills and aptitudes at work.

Policy-makers at the international, national, regional and local levels all have important roles to play in setting the appropriate legal and fiscal frameworks to encourage entrepreneurship and in filling market gaps as necessary. Higher education institutions have a critical role as

intellectual hubs in entrepreneurial ecosystems by serving as incubators for innovation and research, and focal points for collaboration among researchers, students, professors, companies and entrepreneurs. Foundations, NGOs and other organizations can play important facilitation or intermediary roles, often helping to link various stakeholders. Most important are the champions (often serial entrepreneurs but also educators, staff or students) who leverage their social capital and serve as catalysts for building the entrepreneurial ecosystem.

As illustrated by the World Economic Forum's Global Education Initiative, the need for multistakeholder partnerships is critical for education and even more so for entrepreneurship education. There is a need for capacity and capability building within the entrepreneurial ecosystem. This is best done through partnerships and a "portfolio" approach, rather than through one-off initiatives.

Entrepreneurial Ecosystem
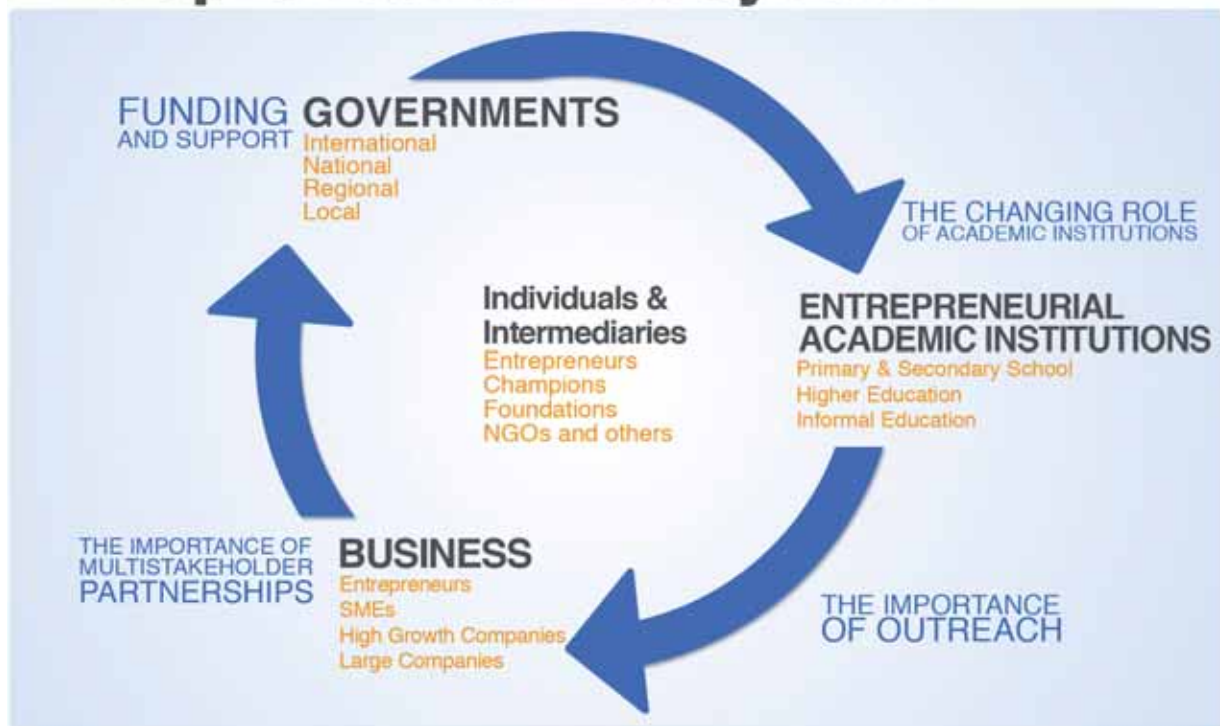
Strive for Effective Outcomes and Impact

The purpose and goals of entrepreneurship education need greater clarity. They should be based on a broadly defined set of outcomes, not only on narrow measures such as the number of start-ups created. Entrepreneurship education is about developing attitudes, behaviours and capacities at the individual level. Inherently, it is about leadership. It is also about skills and attitudes that can take many forms during an individual's career, creating a range of long-term benefits to society and the economy.

Developing a broader framework for assessing entrepreneurship education is necessary to capture a richer and more nuanced set of outcomes. Measuring intangible outcomes is difficult. However, applying only simple measures of the potentially wrong things can result in falling far short of the intended outcomes and impact. Even worse, anecdotal stories of "best" practices could lead to the replication of programmes that actually are not working, resulting in wasted time and money for little to no impact.

To measure effectively, better data is needed. While there have been many studies and research projects on entrepreneurship, to date, there has not been enough empirical research on entrepreneurship education itself and its impact. Longitudinal studies are not easy to design and implement, but they could provide better evidence of the impact of entrepreneurship education. Internationally comparable statistics and data collection are imperative as well.

Leverage Technology as an Enabler

Throughout the report, the role of technology in delivering entrepreneurship education is evident, particularly in creating greater access and scalability. While the development community has struggled with the challenges of social inclusion, poverty alleviation and interventions to overcome barriers to progress, the IT and telecommunications industries have entered the fray and created dramatic changes in the landscape of opportunity and social inclusion. The growth of the Internet and use of computers and mobile phones have also made a huge impact, particularly with small businesses and education.

The role of the media is also important for raising awareness and creating role models. Radio and television have grown across the world, especially after satellite television. This parallel development of ICT and media has created new infrastructure and opportunities, and changed the landscape. The ICT industry has been proactive in working with users, content developers, educational institutions, policy-makers and others to frame opportunities that can be disseminated to those who would benefit most from them. Those in the entrepreneurship education field tend to be early adopters of the latest technology. The full range of implications for enterprise and entrepreneurship education needs to be further developed, particularly in developing economies where scaling is critical.

" Education is the clearest path to individual opportunity and societal growth, and entrepreneurship education is especially vital to fuelling a more robust global economy. Entrepreneurs bring new ideas to life through innovation, creativity and the desire to build something of lasting value. Therefore, we must continually foster educational cultures within our companies, governments and communities to keep the entrepreneurship pipeline filled for generations to come."

Dirk Meyer, President and CEO, AMD

Driving Forces of Entrepreneurship Education

SHAILENDRA VYAKARNAM,
Centre for Entrepreneurial Learning University of Cambridge

The convergence of globalization, technological innovations, knowledge-based economies and demographic trends has led to an increased focus on the effects and importance of entrepreneurship. In this context, entrepreneurship is a driving force of economic development, structural change and job creation. It is also a way to address the challenge of poverty reduction.

In the United States, entrepreneurship has historically been a key driver of economic growth. In the past several decades, entrepreneurial dynamism has been evident both in the number of new enterprises created each year and in the fact that, of the leading 100 US firms, the majority did not exist 20-30 years ago. The process of renewal, in which old companies evolve or go out of business and are replaced by more dynamic firms, is important for the vitality of economies (Birch, 2002).

All countries need a greater focus on entrepreneurship and innovation to help spur competitiveness, growth and job creation. Underlying issues and challenges include the mindset and skills of young people (European Commission, 2002). The low exposure to entrepreneurship, combined with the lack of role models and the repercussions for failure, makes the barriers to entry in many countries significantly higher than in North America.

How can countries reinvigorate dynamism through entrepreneurship? Entrepreneurship education can help promote an entrepreneurial and innovative culture by changing mindsets and providing the necessary skills. Schools systems have traditionally focused on providing basic skills and ensuring students can secure future jobs – not on teaching students to become entrepreneurs. Meanwhile globalization, the rapid development of technology and the lower cost of travel have changed the nature of work. It is no longer enough to train students for a career. Schools and universities must prepare students to work in a dynamic, rapidly changing entrepreneurial and global environment. Entrepreneurship is critical for understanding and operating in the current and future global economy.

For entrepreneurship to thrive, it must operate in a well-functioning business and regulatory environment. Without the proper framework conditions, even potential entrepreneurs wanting to start companies will not do so. In the United States, business innovation is fuelled by highly competitive markets, advanced financial and university infrastructure, property rights, labour flexibility, and government support of R&D, directly and through procurement (Dennis, 2006). Carl Schramm, President and CEO, Kauffman Foundation, has written extensively about the unique multifaceted system for nurturing high-impact entrepreneurship in the United States and provides many valuable insights for other countries (Schramm, 2004).

Entrepreneurship is viewed as a major driver of innovation, competitiveness and growth. National governments and international organizations such as UNESCO, OECD, the European Commission and others have increased their focus on entrepreneurship education. These initiatives bode well for ensuring sustained momentum to encourage schools and universities to make commitments in this area and for policy-makers to help facilitate the process. Now that so many studies have pointed in the same direction, it is time to take action through multistakeholder partnerships.

" Entrepreneurship refers to an individual's ability to turn ideas into action. It includes creativity, innovation and taking calculated risk, as well as the ability to plan and manage projects in order to achieve objectives. This supports everyone in day-to-day life at home and in society; makes employees more aware of the context of their work and better able to seize opportunities, and provides a foundation for entrepreneurs establishing a social or commercial activity."

European Commission, 2008

The Evolution of Entrepreneurship Education

Entrepreneurship education started over a century ago, with organizations such as Junior Achievement as pioneers. However, entrepreneurship has only been part of the curriculum in higher education institutions for 50 years. The first graduate course in entrepreneurship was offered at Harvard University in 1947 (Katz, 2003) by Professor Miles Mace. Today, entrepreneurship courses are offered at most universities across the United States and increasingly at universities all over the world. The demand has been driven by the students themselves, who are eager to take courses ranging from business planning and start-up, to entrepreneurial finance and technology management. This section briefly traces the origins of three sources of entrepreneurship education.

These approaches have influenced the pedagogical developments in entrepreneurship education and development:

- The role of management and business education in creating content for managers and leaders.
- Training for self-employment and new ventures in order to cope with large-scale unemployment and underemployment in many countries.
- Personal development for creating a more democratic society through leadership development, practical skills and community building.

Each of these three sources (see figure below) of entrepreneurship education, as we understand it today, has led to the creation and development of teaching materials, methods and frameworks for the future.
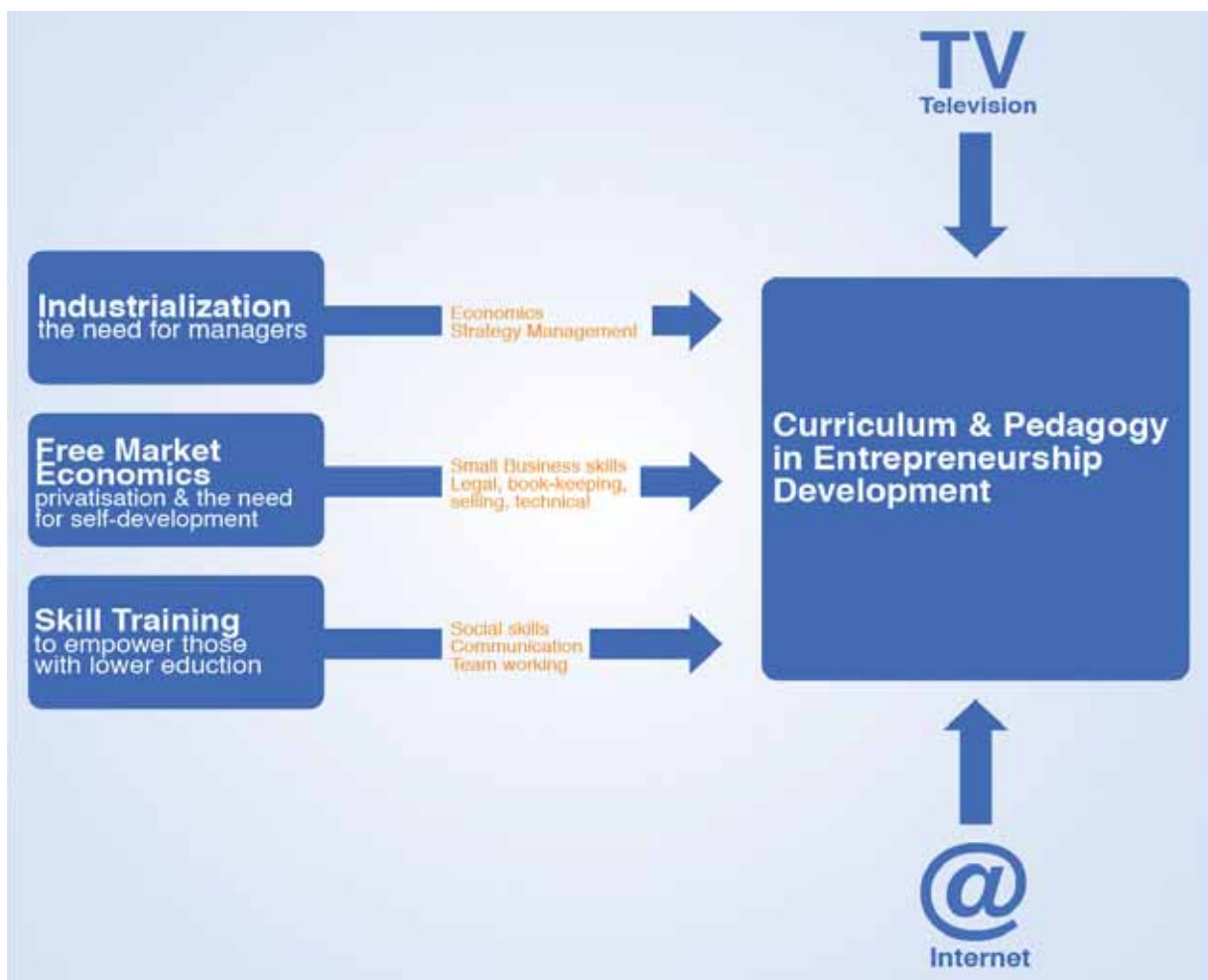
We develop a brief overview of these three sources of entrepreneurship education, taking a largely historical perspective, only to lay down the foundations for what we believe is the present state of the art. In the figure above we add what we believe is a "left-field" new entrant to the whole spectre of entrepreneurship education – television and the Internet.

Efficiency and Effectiveness

The early years of management education and development focused on more effective and efficient managers – as loyal workers for large corporations. Many business schools and management departments were established alongside well-respected universities, including Wharton, Harvard and Sloan, to name a few. The view held at the start of the 20th century was that large corporations created efficiencies of scale and that they were required to solve the big problems of the time – unemployment and the need for infrastructure.

There were other drivers for such thinking – not least, Henry Ford's vision of producing cars on well-honed production lines. Industrialization, starting a century earlier, broke up tasks into smaller units so that each member of the workforce could focus on a component part and become efficient.

Business schools were therefore influenced by the prevalent economic thinking and responded to the needs of management. They sought to understand motivation (Maslow's hierarchy of needs); how and why workers respond to stimuli (Hawthorne studies); how to reward them (McClelland's need for achievement motivation); and how to manage them (McGregor's Theory X and Theory Y). In addition to learning how to manage people, students were taught economics, strategy, marketing, finance, organization theory and more recently, technology (especially IT).

Given the origins of management education – to find more efficient means of production and to gain competitive advantage in a free (global) market – the questions asked in the first half of the 20th century were not focused on

entrepreneurship or innovation. Even the great works of people like Schumpeter did not influence management education curriculum at that time.

Instead the thinkers in that period, including John K. Galbraith, believed that the day of the small entrepreneur was over and that the future of free markets lay in the hands of large organizations. By implication, they felt that we needed to learn more about how to lead and manage such organizations and how these institutions were going to serve the needs of society.

We should not be too critical of this line of thinking in hindsight. The world was emerging from food shortages, two world wars, huge reparation costs in Europe and debt burdens. A cold war of ideologies and an arms race were developing, and a growing number of countries were gaining their independence from imperialism. Many countries were also starting to experience democratic systems while adopting planned supply side economics to overcome shortages and poor infrastructure.

The prevalent thinking took a fundamentally institutional view of the world. People were seen as a resource to lead, manage and to be led and managed for the greater good of the corporation. In a famous speech in 1953 when Charles Wilson moved from being President of General Motors to becoming Secretary of Defence, he responded to a question about conflicts of interest by saying: "What's good for General Motors is good for America."

The view of management education as a means to produce efficient and effective managers persisted for a long time. Even today, it influences curriculum, methods of teaching and the nature of research and publications.

Small Is Beautiful

A different and more atomized view emerged in the mid-1970s from two unlikely sources. The first came in Schumacher's seminal work, "Small is Beautiful." Schumacher, recognizing the very high levels of unemployment and poverty across the world, argued that the focus on large-scale projects and organizations

created a huge divide between the haves and the have-nots. According to Schumaher, individuals matter. With training, education and support, individuals can regain their dignity, work towards self-employment and become active members of the national economy.

> In 1955 Schumacher travelled to Burma as an economic consultant. While there, he developed the principles of what he called "Buddhist economics", based on the belief that good work was essential for proper human development and that "production from local resources for local needs is the most rational way of economic life."[3]

These views were more in line with earlier philosophers like John Ruskin and Mahatma Gandhi than with Schumacher's early mentor, John Maynard Keynes. By the time of his death in 1977, Schumacher's ideas started to take off, resulting in huge growth in programmes to train people for self-employment.

The other unexpected source was Margaret Thatcher, who became Prime Minister of the United Kingdom in 1979. Early in her reign, it became clear that she preferred private enterprise and celebrated individual responsibility. Her values took root alongside what became known as Reaganomics. Then-US President Ronald Reagan and Thatcher together promoted privatization and free market economics. Their cause was aided by the fuel and resultant economic crises of the time, which caused the IMF and the World Bank to lose appetite for continued funding of large, state-owned, loss-making businesses.

Thus, from the late-1970s and early-1980s, around the world we witnessed a surge of interest in privatization and the impact of self-employment programmes.

Table 1	Selection of Self-Employment Programmes
COUNTRY	**NATURE OF PROGRAMMES**
UK	Overseas Development Administration, now the Department for International Development. Many programmes around the world on starting small companies, incubator infrastructure, training of trainers, creation and development of teaching materials, conference sponsorships.
US	USAID programmes, similar to UK.
Germany	GTZ programmes promoting intermediate technology, development of technical training and transfer of technology.
Netherlands	Micro-credit, village-level and rural enterprise.
Sweden	Funding programmes, academics supporting projects.
Canada	Funding programmes, academics supporting projects.
United Nations	Several institutions, including ILO, FAO, UNDP and UNIDO, involved in programmes on gender equality, credit provision, infrastructure, etc.
World Bank	Through the IFC and with the IMF, major institutions continued to be funded and lines of credit provided for "SME development" through national banks.
Commonwealth Institute and related organizations	Exchanges between countries – South-South, training, market access, export encouragement, import substitution, technology transfer, etc.

The Role of Technology

While the development community has struggled with the challenges of social inclusion, poverty alleviation, and barriers to progress, the IT and telecommunications industries have created dramatic changes in the landscape of opportunity and social inclusion.

Affordable technologies, particularly mobile telephones, have made significant impacts on the lives of poor people. In addition to providing social connections, mobile telephony has created significant economic possibilities. For example, mobile phones now permit the "un-banked" to transfer money and execute other transactions at very affordable rates. [4]

The growth of the Internet and use of computers have made a huge impact, particularly on small businesses and education. Mass media in the form of radio and television has grown across the world, especially after the introduction of satellite television. However, these are not interactive and thus each region is dependent on programme development to provide useful content in terms of creating greater levels of social inclusion. Mass media can play an important role – for example in reaching out to communities with valuable information and education[5].

Table 2	Impact of ICT in Scaling Entrepreneurial Activity
Mobile Phones	Market information, customer contact, operational effectiveness, and supplier connections. Use of SMS for quick transactions and communication.
Mobile Phone Banking	Microtransactions become affordable and immediate.
Personal Computers	Entertainment, education, connections via the Internet, correspondence, documents, etc.
Voice Activated Systems	Growth in capacity to provide information, correct routing of inquiries.
Electronic Banking	Faster and cheaper transfers of money, inquiries on accounts and management of payroll for very large organizations.
ATMs	Safe access to cash via personal accounts. Increases use of banking services, local payments, etc.
Radio	Transmission of information and education. One long running example is The Archers in the UK, providing education for farmers.
Television	Increasing numbers of talent and other competitive shows, business programmes, information and education.
Internet	Use of the Web, e-mails, searching etc., accelerating democratization of knowledge and opportunity. Remote health care.
ICT Infrastructure	If these technologies are to make a difference to an increasing number of people there needs to be a parallel growth in affordable infrastructure. Mainly an interface at present between researchers and companies[6].

4 http://www.molotech.org.za/blog/2007/06/27/intel%c2%ae-learn-program-demonstrates-success-in-teaching-21st-century-skills/
   http://www.shareideas.org/index.php/Main_Page
   http://www.shareideas.org/index.php/Category:Education
   http://www.shareideas.org/index.php/Lifelines_India:_Supporting_Rural_Teachers
   http://psdblog.worldbank.org/psdblog/2006/06/mobile_banking_.html
5 http://marketplace.publicradio.org/shows/2006/06/16/PM200606168.html
6 http://www.tenet.res.in/Partners/index.php

The development of ICT has created new infrastructure and opportunities for enhanced social inclusion. The ICT industry must work with users, policy-makers and others to frame a set of opportunities that can be disseminated to those who would benefit most from it. The full range of implications for enterprise and entrepreneurship education needs to be considered.

" Every citizen, no matter where they live or what their circumstances, has an equal right to a quality education. Based on more than a decade of working with education leaders, governments, businesses and development organizations, Microsoft firmly believes that information technology can help transform both teaching and learning, enabling higher quality education experiences for everyone."

Craig Mundie,
Chief Research and Strategy Officer,
Microsoft Corporation

Television

Recently, we have seen a surge of public events driven not by policy or educational institutions, but by the media. These are the growing number of television programmes presenting competitions among ordinary people. They promote a high level of aspiration and tap into people's willingness to try new endeavours. Their impact should not be underestimated. Despite numerous critics, these programmes present significant lessons for personal development and education.

Truly fascinating about the surge in this format of programming is how large the viewing audiences are and how these programmes tap into a pent up demand that has not been satisfied through formal education. We do not yet know whether this form of "edutainment" will become more prevalent because of its ability to entertain and engage with viewers. However, we do know that many of these programmes raise important questions and lessons on personal motivation, skills, and application of expertise and knowledge.

The same is true with online games. Educators now must compete for the hearts and minds of their students against professional presenters, celebrities and highly professional productions. Will the formal education sector not have to respond to this left-field entrant?

Entrepreneurship Education for Youth

Courtesy of NFTE

STEVE MARIOTTI AND DANIEL RABUZZI,
The National Foundation for Teaching Entrepreneurship

Why Entrepreneurship Education for Youth is important

Young people become entrepreneurs for the same reasons that adults do, sometimes out of necessity and sometimes to capitalize on an opportunity. Examples of youth entrepreneurship range from the mundane (cutting lawns or babysitting) to groundbreaking (developing a new Web technology or service). The advent of the digital age has helped reduce barriers to entry for younger people both because each successive generation grows up more digitally savvy than its predecessors, and because geographic barriers to business have been essentially eliminated. As global popular culture continues to be centred on youth, young people have been able to exploit their "native fluency" to score entrepreneurial success in music, video games, apparel and other industries.

> " *We are facing a transition, and we must take this opportunity to provide today's students and entrepreneurs with the tools and the thinking that is required for the future. Collaborative technologies can fundamentally transform both how we teach and learn. We need to harness the power of the Internet and these new technologies for creating and sharing knowledge that will prepare students with the skills to compete in the 21st century."*
>
> John T. Chambers, Chairman and CEO, Cisco

"Necessity" entrepreneurship may take the form of selling used clothing in flea markets or the like. Increased focus is needed on these activities, so that they can become viable long-term businesses or provide the youthful entrepreneur with seed capital for more complex and more rewarding endeavours. All human beings are inherently entrepreneurial, that is, entrepreneurial potential is in all of us, in the same sense that all humans are innately musical, linguistic and morally reflective. Risk-taking, opportunity recognition, competitive collaboration, and innovation define the species, and are a crucial aspect of self-expression. Surveys in many cultures indicate that youth specifically harbour strong if latent entrepreneurial tendencies.

Unfortunately, the structures and delivery of mass education in most countries often thwart or throttle the natural entrepreneurial impulse in youth. For the past two decades countries all over the world have begun to recognize the failure of their systems to educate young people to create, and not simply respond to, economic opportunities. There is a hunger to identify, analyse and implement practices that enable education to foster entrepreneurship at the early stages of an individual's education.

In the US and Europe, recent studies have also revealed a disastrously high number of students who drop out of school, with all the consequent social and economic problems that entails. By unleashing the innate spirit, using interactive, experiential forms of teaching and learning, and connecting the classroom with the workplace, entrepreneurship education may be a factor in helping to keep students in school.

According to the UN's World Youth Report 2005, about 209 million young people live on less than US$ 1 a day and around 515 million live on less than US$ 2 a day. People between the ages of 15-24 make up a quarter of the world's working population, but they represent half of its unemployed. The Millennium Development Goals will not be met unless the specific needs of young people are addressed because 51 % of the combined population of developing and least-developed countries are below the age of 25, and 20 % are 15-24 years of age. Moreover, the decimation of adult populations in many developing countries by HIV/AIDS is forcing economic responsibility on the younger generations.

National and supranational policy-makers have focused in the past decade on youth entrepreneurship as an important tool to combat persistent youth unemployment, criminality, and so on. In addition, evidence is mounting that girls and young women may benefit disproportionately from entrepreneurship education, in part because they are often denied full access to, or advancement within, existing (male-dominated) organizations and hence seek tools to create their own businesses. For all of these reasons, youth entrepreneurship education is a theme that needed to be addressed separately in this report.

1.1 Characteristics of Entrepreneurial Activity

1.1.1 Definition of Youth Entrepreneurship

Youth entrepreneurship is not essentially different from entrepreneurship among adults. It involves engaging in socially useful wealth creation through application of innovative thinking and execution to meet consumer needs, using one's own labour, time, and ideas. The only difference is in the age of the entrepreneur. What differs between youth and adult entrepreneurship – given the inherently different levels of intellectual and behavioural maturity – is how entrepreneurship is taught and how it is learned.

1.1.2 Target Group

The target group of this report is youth aged 6-22; that is, individuals who are of age for formal schooling, including the first years of postsecondary education. Some may express surprise at starting so young, but several entrepreneurship education programmes are doing so with seeming success. For instance, Junior Achievement works across the world at all levels of primary and secondary school and Netherlands-based Aflatoun focuses on primary school students. In Uganda, Kenya, and India, Aflatoun is linking entrepreneurship education with broader values of education and UNICEF's Child Friendly Schools initiative.

One crucial fact about working with youth is that they are considered minors by law in most or all countries (with the threshold age varying). Thus, they typically cannot establish a corporate entity, make contracts or borrow in their own names. There is also an extra level of prudence and care required in terms of interaction with adults. Many countries now require criminal background checks for adults who interact with youths: teachers, social workers, business plan coaches, and the like. Establishing viable youth entrepreneurship education programmes means recognizing all legal liability and requirements for working with minors and training all teachers and other youth workers about their added risks and responsibilities.

1.1.3 Driving Forces

Empirical evidence is fairly strong that economic growth over time is necessary for poverty reduction; it strongly suggests that entrepreneurship boosts economic growth and also (albeit more weakly) that educational attainment increases the rate of economic growth. We have not found studies that specifically link entrepreneurship education for youth to increased growth, but the three relationships above are suggestive.

More specific to youth is the global increase in the numbers of young people, both absolutely and as a percentage of total population, which is evident in most countries outside Europe. In the US, the so-called millennial cohort – those born between 1980 and 1990 – is the largest generation in history and has already begun to alter society in social, economic, and political terms. Similar trends are visible in China, India, Latin America and across the Arab world.

Two features of the millennial cohort stand out: their independence of mind and their desire for innovation, both fostered by the digital revolution that coincides with their generation. Digital technologies, especially those that are Web-based, change at remarkable speed, flatten hierarchies, erode or erase distance, and enable individuals to do what in the past only organizations could do. "Millennials" – from Kuala Lumpur to Los Angeles, from Cairo to Johannesburg – assume they can act on their own. Such millennials often get frustrated with the received wisdom and commands from their elders – the perfect recipe for entrepreneurship.

Cultural attitudes vary, of course, and we must not over generalize. Having said that, we see entrepreneurial behaviour currently most praised and supported in the US, the United Kingdom, Norway, Poland and the Baltic republics (and other former Eastern block countries) China, South Korea, Nigeria, Ghana and other parts of West Africa – to name some leading examples (though not uniformly even in these countries). However, in many parts of the world older generations still view entrepreneurship more sceptically and sometimes with hostility (Theil, 2008). Young people want to overturn these old ways of thinking, driving the demand for entrepreneurship education.

Demand is especially high among youths from marginalized populations, and not least from females – in part because traditional organizations have excluded or frustrated them. They, and again young women especially, have seized the opportunity for education in general and for entrepreneurship education in particular in many localities over the past few decades. Networks such as Aflatoun, Ashoka, ACCION, Making Cents International, Shell Live Wire, Grameen, Echoing Green, Students for Advancement of Global Entrepreneurship (SAGE), Junior Achievement, Students in Free Enterprise (SIFE), the Consortium of Women Entrepreneurs of India, and many others have sprung up to meet the demand and to grow the field further.

Major corporations are also leading the way in meeting the demand for entrepreneurship education, among them Goldman Sachs (with its *10,000 Women* initiative, for example), Nike (with its focus on the enabling power of sport for women), Microsoft (which sponsors a wide variety of IT-related programmes worldwide), Cisco (with its lead support for the Silatech Youth Employment Initiative), Intel (the Intel International Science & Engineering Fair is, among other things, a showplace for youth entrepreneurship), Nokia (Innovation Camps), Best Buy (with its emphasis on social entrepreneurship), HSBC (with its More than Money Initiative), and HP (with its GET-IT programme for students and graduates, which is part of the Micro-entrepreneurship Accelerator Project).

Support for youth entrepreneurship is most powerfully demonstrated by the growing number of financial sources for this previously un- or under-funded sector. Spurred by the success of Grameen, ACCION and, most recently Kiva, microcredit has become a significant sub-sector of global finance. Examples of microfinance aimed at youth entrepreneurs include the Commonwealth Secretariat's Youth Credit Initiative; the Youth Development Bond, piloted by the Diageo Foundation with Youth Business International and the Bharatiya Yuva Shakti Trust, in India; the PATHWAYS project in Guinea, run by the American Refugee Committee; and Making Cents International, as well as various programmes run by the Fundación

Paraguaya. Seeking to raise a large pool of capital to invest in young entrepreneurs is The YES Fund – A Global Fund for Youth Entrepreneurship, supported by (among others) Microsoft's Unlimited Potential programme. In addition, many development agencies such as the United States Agency for International Development (USAID), the Norwegian Agency for Development Cooperation (NORAD) and the Swedish International Development Cooperation Agency (SIDA) have made youth and entrepreneurship important priorities for funding.

1.2 Opportunities and Challenges

"Andrea Smith" was raised in a drug-infested West Baltimore housing project, and was homeless by the age of eight. Taken in by her stepmother, Andrea, now 20, has her own apartment and is attending a local community college. While in high school, she operated a handcrafted jewellery business after classes, netting about US$ 200 a month – which she used for necessities for herself and her sister. She had taken a school-based entrepreneurship course from the National Foundation for Teaching Entrepreneurship, which also gave Andrea seed funding for her venture. She considers that this business training was critically important to her, both financially and as a life-changing experience.

"Jens Rasmussen" grew up in an economically secure neighbourhood with well-resourced schools. His mother is an executive at a large corporation and his father the managing partner at a national law firm. However, Jens was bored at school, had great trouble following instruction and saw little relevance in what he was taught. A guidance counsellor placed him in an entrepreneurship class and his world changed: he realized that he could control his own learning and could potentially structure his own workplace.

There are millions of young people around the world, disengaged from formal schooling, and in many cases dropping out altogether, with terrible economic, social and ethical consequences. We stress that this is a global issue – examples come from all corners of the world. For example, in the US, around 7,000 students drop out of school every

day; only about half of all students in the nation's 50 largest cities graduate from high school each year; and dropouts from the class of 2007 alone will cost the nation nearly US$ 329 billion in lost wages, taxes, and productivity over their respective lifetimes (Davis, 2008).

The dropout issue cuts across national, religious, and ethnic boundaries, is common to both males and females from all income levels, and is especially stark within marginalized and excluded groups. The challenge to increase graduation rates is a pressing concern, as success in the global economy increasingly depends on ownership and control of abstract knowledge (Stewart, 2001). Individuals and communities will fail if they cannot attain ever-higher baseline education and then continually learn novel and more complex forms of economic and social interaction.

The questions, then, are:
- Why do so many young people from all socioeconomic backgrounds turn away from existing forms of public education? And why do these systems fail so many of those they are designed to serve?
- What can be done to re-engage our youth and help them learn in ways that will optimize both their individual lives and increase the general welfare?

Many young people disengage because:
- They see no connection between the required academic curriculum and what they observe or wish to discover about the workplace. Many students want to learn about earning a living, making money and creating wealth. What is typically not taught is the concept of ownership – specifically the individual's right to own his or her future, to own his or her time, to own property – which means independence.
- One size does not fit all when it comes to learning. Many educators recognize the importance of student-centred, experiential education. Robert Sternberg, Howard Gardner and others have stressed the importance of multiple learning styles. Recent advances in the neurosciences suggest that human learning is far more complex than previously understood, and that mass educational systems may even work against

certain innate learning impulses. William Damon and Richard Lerner have recently highlighted the importance of understanding "the psychological ingredients of successful entrepreneurship", emphasizing ongoing research into decoding "entrepreneurial cognition" (Damon, 2008).

The Response

To address both the problem of school disengagement and the need for individuals to learn to take responsibility for their futures, we propose that every school system offer entrepreneurship education. We aim our proposals – our call to action – at senior policy-makers, because the change must occur primarily in the public systems of education and youth development. Senior policy-makers must foster the growth of an entrepreneurship ecosystem that is itself entrepreneurial and that liberates the innate creative abilities of youth.

Such an ecosystem is the best basis for sustained and equitable economic growth. Bringing entrepreneurship education to all is integral to the aims of the Forum's Global Education Initiative, as well as to those of the UN's Education for All and the Millennium Development Goals.

Young people around the world have a right to entrepreneurship education. Every individual has the right to be exposed to ownership concepts, to the possibility of ownership, and to the habits of thought that lead to wealth creation. These rights are grounded in the individual's entitlement to the ownership of one's person, labour, time, and ideas (Mariotti, 2005). At the core of our argument is the concept of self-realization within the context of, and as it contributes to, the common good. Entrepreneurship is a means for young people to build value for others, to help create and engage in communities, and to enhance social well-being.

The main lesson of entrepreneurship education is that new value created will be owned by the creator, not appropriated by someone else. The resistance to teaching "ownership" was hammered home for one of us in a conversation with a venture capitalist, who expressed dismayed surprise at

our emphasis: "But, if you teach the principles of ownership, who will do the work?" Entrepreneurship explodes older definitions of work: we will all do the work, but the nature of work itself will change, and most importantly we will all control how the work gets done. Perhaps each of us should always be in business for ourselves.

In this respect, entrepreneurship is not only about skills or mindsets but also a means for an individual to become "ownership literate." Former National Basketball Association star Allan Houston put it succinctly when asked why he launched an entrepreneurship education programme for inner-city youth: "My parents owned a grocery store and a restaurant, so growing up I saw ownership as something that was always a reality. And we weren't making a lot of money, but just the ability to say you own something was powerful to me back then, and it's what I can appreciate even more now that I'm older."

Entrepreneurship education focuses not on the direct labour of the individual worker – as laudable as that is – but on the net profit that accrues to the individual who owns.

Most economic development policies emphasize the increase in an individual's wage or salary (again, a commendable thing), but ultimately that emphasis reinforces the existing structure of ownership. The key shift in teaching and in policy is to move the conversation from the "direct labour" line on the income statement (see illustration below) to the "net profit" line. As a corollary, entrepreneurship education teaches the most fundamental lesson of financial literacy: how to live within one's means. Failure to live within one's means results in a failure to achieve a net profit, which ultimately means going out of business.

Helping young people liberate their innate entrepreneurial skills and learn about entrepreneurship calls for educational practices that differ in key ways from those used in workplaces, in universities, and in other adult learning environments. Doing so also means potentially radical changes to mass industrial-age primary and secondary education as it has developed in almost every country – entrepreneurship education must itself be entrepreneurial, the entrepreneurship ecosystem must bloom.

Before the entrepreneurial ecosystem can bloom, systems of education must embrace the idea that entrepreneurship is a "good thing." As noted above, to a greater or lesser degree in just about every culture there are sceptical or even hostile attitudinal barriers to entrepreneurship. Intuitively, people seem to understand the "creative destruction" that accompanies entrepreneurial business enterprise, hence the fear and suspicion it can confront. And hence the need for entrepreneurship education aimed specifically at young people, who are typically more open to self-exploration and usually more willing to challenge received wisdom and societal prejudice than are most adults.

Making the change to universal availability of youth entrepreneurship education is, of course, a monumental task. Changing existing school systems will take time, especially because teachers will need to be retrained for the experiential, hands-on approach entrepreneurship education requires. A major key to success will be putting experiential techniques and entrepreneurship content into the basic training aspiring teachers receive at schools of education and teachers' colleges.

1.3 Existing Practices
1.3.1 What to Teach

Celebrate the Entire Range of a Learner's Talent
Entrepreneurship education celebrates each child's entire range of talents and aspirations, and does not rely primarily on simplistic undifferentiated measures of human performance, such as grade-point averages, test scores or intelligence quotients. Entrepreneurship education rewards the diversity of approaches that emerge from individuals working to meet the needs of others.

As the European Commission framed matters in a 2 February 2006 Communication to the European Council: "Nurturing qualities such as creativity and a spirit of initiative helps develop entrepreneurial attitudes … done through active learning based on children's natural curiosity." "Celebrate", "reward", "curiosity" and "creativity" are operative words: recent neurological research suggests that fostering and strengthening a positive outlook may lead to increased performance and a virtuous feedback loop.

Focus on Fundamentals
Entrepreneurship education, especially for youth, must focus on a handful of key fundamentals – students must learn these. Among them:
- Joy of business, serving others, wealth creation and ownership.
- Market opportunity recognition and research.
- Empathy ("walk in your customer's shoes").
- Comparative advantage.
- Laws of supply and demand.
- Marginal utility ("economics of one unit").
- Return on investment and break-even calculation.
- Compound interest ("Rule of 72").

The National Foundation for Teaching Entrepreneurship has codified what it views as the essential lessons in "Twelve Concepts Every Young Person Should Learn About Business Before Graduating High School" (see figure below). Most youth entrepreneurship educators have similar lists. Aflatoun, for instance, speaks of its five core elements: personal understanding and exploration, rights and responsibilities, saving and spending, planning and budgeting, and social and financial enterprise.

NFTE - Twelve Concepts Every Young Person Should Learn About Business Before Graduating High School

The Importance of Mental and Physical Health

This means eating right; getting enough sleep and exercise; and building strong ties with friends, family and community. You are part of a larger world and your network is crucial to your personal and professional success. The most important relationship you will ever have with anyone for the rest of your life is yourself - so treat yourself well; do the right things.

The Joy of Business and Opportunity Recognition

Where others see obstacles, train your mind to see opportunities. You cannot teach drive and hunger in business school, but I have met thousands of young people who have the drive and the hunger to make their families proud, build good communities, go to college and exit poverty via entrepreneurship.

The Economics of One Unit

This is the cornerstone of the business plan. Many young people think of how they will make millions. I want them to think how of how they will sell one product or one hour of service and make a profit.

The Laws of Supply and Demand

The laws of supply and demand are the most important economic concepts that and entrepreneur needs to know! The forces of supply and demand interact in a free market economy to determine prices.

Don't compete, CREATE a Comparative Advantage

How will you beat your competition? What's your edge in business? How can you CREATE a winning business model with an advantage?

Wealth Creation

Most wealth is created through the creation of a business opportunity combined with ownership. In an entrepreneurial endeavor wealth is created by building a business that has a profit and can be sold for a multiple of earnings. Both mental and monetary wealth are the end result of a successful entrepreneurial career.

Marketing: putting yourself in the customer's shoes

If you listen to your customer and ask good questions, they will tell you their needs and what causes them stress. People are fascinating and you can learn so much about their needs if you put yourself into their shoes by asking good questions and really LISTENING.

Leadership and giving back

Every great leader in business is aware of the community around them and looks to satisfy a community need. Philanthropy is good business, and if you are known as someone who cares about your community, more people will want to do business with you.

Financial Statements (ROI and Breakeven)

It's important to understand that giving time, energy and money to your business is an investment. You do this because you believe that someday your business will earn more than the time energy and money you put into it. And breakeven is important because it tells you whether or not you can afford your marketing plan.

The Basic Sales Call

I always encourage students to view selling as teaching. By identifying the consumer needs, a young person can educate the customer on the benefits of the product or service.

How to Write a Business Plan

There is an adage that goes, "Failing to plan is planning to fail." A lot of young people have visions and dreams. But by putting them in writing, I am convinced their chances of success will improve.

The Rule of 72

If you take the percentage of interest you receive on an investment and divide that number by 72, you will know how many years it will take to double your investment. This concept is key to wealth creation and is a valuable way to teach a young person to start investing early.

1.3.2 Where to Teach

Integrate Entrepreneurship Education into Mainstream Curricula
Among the groups advocating for inclusion of youth entrepreneurship within national and local curricula are Youth Business International, Junior Achievement, the National Foundation for Teaching Entrepreneurship, the Consortium for Entrepreneurship Education (USA), the Youth Entrepreneurship Strategy Group (hosted by The Aspen Institute), the Know About Business programme of the International Labour Office, ImagineNations, and The YES Fund.

Wholesale integration at national levels requires a careful allocation of class and teacher time and entrepreneurship education curricula that is well-mapped to the existing syllabus. Providers such as Junior Achievement achieve scale by working hand-in-hand with ministries of education in each country, training teachers and recruiting volunteers from the business community. A key area of engagement is also vocational schools.

In addition to wholesale integration at national levels, specific tactics for connecting entrepreneurship education to the core curriculum include creating entrepreneurship-themed schools and linking secondary school programmes with college and university programmes. Examples of themed schools include the KaosPilot International School of New Business Design & Social Innovation (Aarhus, Denmark), the Ivy Academia charter school in Los Angeles, the Bright China academies in many major cities in the PRC, the Urban Assembly School of Business for Young Women (New York), the Ariel Community Academy (Chicago), and the Entrepreneurship Preparatory School, run by E City in Cleveland, Ohio.

Gainesville, Florida's Buchholz High School Academy of Entrepreneurship[7] is particularly noteworthy. The academy has operated for 14 years, providing a four-year course of study to more than 200 students. Students manage their own entrepreneurial ventures, and also help operate the Spirit Spot, a school-based store that sells snacks, supplies, and school souvenirs. The school is tightly linked into the surrounding business community, participates in both Junior Achievement and DECA, and works with the local community college and the University of Florida.

Forging closer links with colleges and universities will provide a seamless transition for entrepreneurship students – a trajectory of articulated courses. Pioneers in this regard are Miami Dade College and Florida International University, working with the South Florida office of the National Foundation for Teaching Entrepreneurship. Babson College is a long-time leader in outreach to secondary schools and young entrepreneurs.

Other efforts to more closely align youth entrepreneurship education with post-secondary education are Goldman Sachs Foundation-funded programmes run by Prep for Prep and Sponsors for Educational Opportunity, and the Coleman Foundation's support for a wide variety of programmes, particularly at American community colleges, and for the National Association for Community College Entrepreneurship. The Kauffman Foundation's campus initiatives in the US also touch on these elements.

1.3.3 Who Should Teach

Find, Train, and Support the Right Teachers
Entrepreneurship education, to be successful, demands entrepreneurial teachers. Retooling for successful youth entrepreneurship education means selecting and promoting teachers who are able to engage young learners in the necessary experiential activities. Teachers may need training in either or both the experiential pedagogy and the business content. The training curriculum may be nearly as extensive as the underlying curriculum for students. Among others, the Jacobson Institute for Youth Entrepreneurship at the University of Iowa is a leader in teacher training, as are the National Foundation for Teaching Entrepreneurship and Junior Achievement.

Certification of entrepreneurship teachers is an important step towards ensuring that minimum standards are met. The Know About Business programme of the International Labour Office certifies teachers, as do other programmes such as ImagineNations, Junior Achievement and the National Foundation for Teaching Entrepreneurship. Ultimately, teachers colleges will need to include entrepreneurship in the basic curriculum for aspiring educators, and they will need to partner on this topic with business and law schools.

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7 http://www.spiritspotbhs.com/

" Preparing today's students for success and eventual leadership in the new global marketplace is the most important responsibility in education today... Entrepreneurship education is an important tool to achieving these objectives [and]... should be universally available to provide all students with opportunities to explore and fulfil their potential."

Stephanie Bell-Rose, President,
Goldman Sachs Foundation
and Thomas W. Payzant,
Harvard Graduate School of Education

Work Closely with Entrepreneurs

Courtesy of Microsoft

This may sound straightforward but can be surprisingly difficult, given time and logistical constraints – successful interaction takes significant planning and execution. No entrepreneurship programme can succeed without close interaction with entrepreneurs. As important as developing curricula for the students, and professional development materials for the teachers, is developing materials for the entrepreneurs and other businesspeople (typically volunteers) who will work with the programmes.

Work Closely with Parents, Older Siblings, and Other Caring Adults

Parents, or family more generally, can play a very important role. Unfortunately, many marginalized children have weak family support or entrepreneurial traditions, hence the critical need for introduction to principles of entrepreneurship in school, or other educational settings. Even when family provides models and support for entrepreneurial behaviour, specific skill sets and validation of attitudes need to be learned or refined outside the home. In this regard, entrepreneurship education is no different from any other occupation or profession. The child born into a musical family will certainly benefit from that, but will also need formal training and encouragement outside the family circle to unleash and mould fully his or her musical talents.

Above all, teachers play a crucial role. A weakness in many discussions about youth entrepreneurship education has been lack of focus on recruitment of, and training and support for, the teachers. But there is no magic formula to make this basic truism a reality, no more so in entrepreneurship education than there is in education generally. The current state of research in the field has not yet produced a clear profile of what makes an ideal entrepreneurship education teacher. What appears to work best is a combination of a good classroom instructor (who may or may not have content knowledge about entrepreneurship before training in the subject) and a series of structured interactions with actual entrepreneurs. Very few teachers will have been entrepreneurs, and very few entrepreneurs will be good teachers. The key is blending the two, so that pedagogy and content meld seamlessly – and the student learns.

1.3.4 How to Teach

Mainstream pedagogy will have to change, leading to the hands-on, project-based, multidisciplinary, non-linear approaches that entrepreneurship education requires. We need to move towards these higher-order thinking skills for *all* young people.

"See One, Do One, Teach One"

Entrepreneurship is reflective action; no amount of book-based learning on its own will allow the student to progress in this field. One cannot just study a chart of the steps to learn a new dance! And there is no better way to confirm and demonstrate that mastery exists than to teach a skill – especially a newly won skill.

The curriculum for most successful youth entrepreneurship programmes includes many or all of the activities below, typically with clear learning objectives tied to textbook themes, usually with pre- and post-reflective sessions and evaluations, and frequently taking place outside the classroom:

- Simulations and games
- Interactive teamwork and group activities
- Direct, action-oriented market research (students recognize market opportunities by observing and interviewing potential customers, identifying needs in their own communities)
- Student buying and selling events, using real money (grants or loans from the school or programme)
- Field trips to local businesses, especially entrepreneurial ventures
- Entrepreneurs or venture funders as guest speakers in class
- Business plan and other competitions, with business people as judges
- Student-run businesses, using real money (including in-school stores)

During the buying/selling events and especially during the competitions, students have the chance to teach one another. Some of the most valuable learning may come informally and tacitly, as younger or less experienced students learn by observing and imitating those whose techniques and skills are greater. The use of real money and the involvement of business people drive home the lessons in a way no textbook discussion can[8].

Visualize and Plan for Business

Entrepreneurs need "forward-looking peripheral vision" to succeed. To help develop this skill, students must create and present business plans. Many organizations provide business plan templates geared to different levels of student experience, among them the US Small Business Administration, Junior Achievement, the Shell LiveWire network, the National Federation of Independent Business, and the National Foundation for Teaching Entrepreneurship.

Learn through Visuals/Use Multimedia

Related to the need to visualize is the need to teach and learn using visuals. Not coincidentally, a hugely disproportionate number of successful entrepreneurs are dyslexic or have other cognitive "disorders" (Bowers, 2007). It may be that what has been dismissed or denigrated as a disorder in a hierarchical/linear industrial society with concentrated ownership structures will become a precious asset celebrated in the emerging entrepreneurial society. To accommodate different learning styles, youth entrepreneurship education should expand the pedagogical toolkit to include not only text but a liberal use of visuals as well, and especially text and visuals interlaced. Promising practices include:

- Wall charts
- Posters
- Workbooks
- Drawing exercises
- Charrette-style design workshops

8 For example: Youth About Business (USA); *El Mercado de Cooperativas de Empresa Joven Europea* and *Emprender en mi Escuela*, Seville, Spain; Marketplace for Kids, North Dakota (US; *Programas Jovenes Emprendedores de las Américas* (El Salvador); Making Cents International's MicroEnterprise Fundamentals; The Consortium of Women Entrepreneurs of India's "Young Entrepreneurs Meet," November 2007 in New Delhi; NxLevel's "Enterprising Youth"; Junior Achievement's "It's My Business!"; Students for the Advancement of the Global Economy;, *Mini-Companies in Secondary Education: Best Procedure Report: Final Report of the Expert Group*. Sept. 2005.Brussels; European Commission.

- Games and simulations
- Student clubhouses (the Intel Computer Clubhouse is a good model for the Concept)
- Peer mentoring
- Filming of classes (by students as well as by teachers), with subsequent analysis – leading business schools such as the Acton School of Business, Texas, use film-and-review techniques extensively

Digital tools offer particularly rich learning possibilities. Youth entrepreneurship education must continue to pioneer use of digital learning strategies and techniques. Digital games, simulations, animation, film and digital arts, and immersive environments may be especially well suited to youth entrepreneurship curricula. Early models include the Disney Hot Shot Business Game (sponsored by the Kauffman Foundation); "Going Solo: Creative Tools for Teaching Entrepreneurship", offered by the University of Illinois; Virtual Enterprise, offered through a City University of New York-led consortium; the Corporation for Enterprise Development's eREAL curriculum; the Your Success Network; the M.I.T. "Games-to-Teach" Project, funded by Microsoft, and the simulation programme CESIM.

The National Foundation for Teaching Entrepreneurship's students, at one of their technology-oriented "BizCamps"[9], created 30-second advertisements for their businesses that they could stream over video.

Inspire with Real Examples
Students should read and write about great entrepreneurs of the past and present as part of any entrepreneurship course. The stories of young entrepreneurs and entrepreneurs from poor or marginalized backgrounds may be especially inspirational.

Don't Let Up
Entrepreneurship education cannot be limited to the traditional school day and school year – entrepreneurship is a ceaseless activity. Pioneers in entrepreneurship education in after-school and summertime settings include the Next Generation Venture Fund (supported by the Goldman Sachs Foundation), the University of Connecticut's 4-H Youth Entrepreneur Program, the Entrepreneurial Leadership Academy's six-week summer programme at the Ferguson Senior High School in Miami, and the YMCA of Greater New York's FutureWorks programme.

Mentor, Coach and Incubate
Most successful programmes engage entrepreneurs and other business professionals as volunteer advisors, mentors, and coaches for the students. Leaders in this arena include Youth Entrepreneurs of Kansas, the Bhartiya Yuva Shakti Trust (India), and Cisco's Entrepreneur Institute (aimed at adults but apparently moving into the youth sector with its recent partnership with the Middle East & North Africa's Silatech Youth Employment Initiative). Mentors and coaches play a major role in incubating student businesses.

Young entrepreneurs also need exposure to and support for furthering their education. Programmes such as the Posse Foundation, Management Leaders for Tomorrow, and College Summit in the US are good examples of general guidance for students about post-secondary education, but more such programmes are needed, particularly ones with a focus on young entrepreneurs. Scholarships for students are also essential. One good example of a college scholarship fund targeting young entrepreneurs is the McKelvey Foundation, which offers up to US$ 40,000 over four years for students who own a business.

9 "BizCamp" is a registered trademark of the National Foundation for Teaching Entrepreneurship (NFTE)

Highlight the Achievements of Young Entrepreneurs

Give young entrepreneurs an arena to compete in, where seasoned professionals can evaluate their business plans and provide valuable critique, and where contestants can get a sense of their competition.[10] Business plan and other competitions have become staples in this sector. Typically, a business plan is modelled in the classroom, a template provided, and students coached on how to create a plan for their own business. To test proof of concept, the plans are presented to a panel of business people, using the time-honoured pitch session familiar to business school students the world over and to entrepreneurs seeking to raise funding from investors. The young entrepreneur might have five minutes to present his or her business concept and then five minutes to defend it as the judges ask tough, critical questions.

Crucially, all students – regardless of whether they win or not in the competition –should receive formal feedback from the judges: what worked, what did not, what needs to be improved, etc. It is also best to have students watch each other compete, to learn from one another – marketplaces are social spaces. One of the major benefits of such an exercise is forcing students to move from paper-based analysis to face-to-face persuasion, so they gain an understanding of the indispensable conversation between entrepreneur and funder/customer.

Many of the leading entrepreneurship education programmes use the Web to promote their students' achievements. For instance, YESCarolina (Youth Entrepreneurship South Carolina) makes good use of videos posted to YouTube.

Courtesy of Microsoft

10 Examples: Black Enterprise Teenpreneur Awards, various By Kids for Kids events, various DECA events, Ernst & Young Entrepreneur of the Year Award, Eureka! Entrepreneurship Competition (India), Goldman Sachs Foundation National Social Venture Competition, Goldman Sachs Youth Entrepreneurship Expo, Initiative for a Competitive Inner City Growing Up CEO Awards, Intel International Science & Engineering Fair (the emphasis may be on science but there is a strong entrepreneurial bent to many of the presentations), Making the Business: Youth I.T. Challenge (a Microsoft-National Urban League programme), National Federation of Independent Business/VISA Inc. Young Entrepreneur of the Year Award, National Foundation for Teaching Entrepreneurship/OppenheimerFunds National Youth Entrepreneurship Challenge, Students for Advancement of Global Entrepreneurship World Cup, Youth Business Development Competition at the Said Business School (Oxford). The Skoll Foundation, the Echoing Green Foundation and the Schwab Foundation promote the successes of social entrepreneurs.

1.4 Key Indicators of Success

The biggest challenge facing the field is a lack of commonly accepted metrics for success and protocols for conducting the necessary evaluations. As Damon and Lerner note, "The crucial study of youth entrepreneurship … is still in its infancy … so few studies have been done that most reviews of the entrepreneurship literature do not even mention youth" (Damon & Lerner). As a result, according to other researchers, "Although there is much anecdotal evidence supporting the positive effects of entrepreneurship education at the secondary school level, there has been limited empirical research …" and "… there are numerous studies that attempt to measure the effectiveness of entrepreneurship education and training. Yet, implementing an effective research design to isolate the effects of different programmes … is a monumental task" (Haftendorn, 2003 and Lee & Wong, 2005).

Stephen Spinelli, President of Philadelphia University and former Vice-Provost of Babson College, frames the issue very clearly: " 'Give a person a fish, teach them how to fish' is an industrial-era mentality and autocratic from a management era. The entrepreneurial era is, 'I want to own the pond,' and is a much more chaotic and difficult paradigm. When it's autocratic, it's pretty measurable. When it's hierarchical, it's really easy to measure. And when it's chaotic, it's nearly impossible. The key is to measure it collaboratively and as a national movement. As we make a decision on the definition of entrepreneurship education, is it about starting a business or is it about opportunity recognition or problem solving?" (Aspen Institute, 2008).

One tack to be tried is augmenting traditional academic research on entrepreneurship and education with assessment by business practitioners. As Michael Hennessey (President & CEO of the Coleman Foundation) says: "We need entrepreneurs to come in and evaluate what we are doing … we want them looking at our [entrepreneurial] educational programmes …" (Aspen Institute, 2008).

Practitioners in the schools, and their funders, have to date used success indicators that fall into four categories:
- Academic knowledge about entrepreneurship
- Academic performance more generally
- Business formation and wealth generation
- Personal values and aspirations

Academic knowledge is most easily evaluated. Many programmes use a pre- and a post-survey to test whether students have improved their knowledge of basic facts and concepts about entrepreneurship. For instance, the very term "entrepreneur" is likely to be unknown or little known for those taking the pre-test, but well known –one hopes – by the time those same students take the post-test. Definitions of basic business concepts (for instance: revenue, profit, return on investment) can be readily measured in this way, as the precursor or prerequisite for more advanced work.

An area of great focus right now is measuring the impact of entrepreneurship education on the traditional subjects such as language arts, science and math. Qualitative evidence suggests that there should be positive impact – but rigorous, randomized control studies need to be done to confirm the hypothesis. Many practitioners believe that entrepreneurship education can be designed to improve student scores on standardized math, science, and language exams – doing so is the next major challenge for the sector.

Intermediate measures of academic success are also used by many in the field, particularly improved attendance, engagement in school generally, and graduation rates.

Programmes also track the number, size, longevity and nature of businesses created by students who take youth entrepreneurship courses. Some funders are seeking longitudinal data on whether personal income increases as a result. One statistic that has not routinely been investigated, but should be, is the number of youth

entrepreneurship students who join start-ups – very few people are entrepreneurs in fact, but every entrepreneur needs to attract his or her first, second, third, fourth employee to what is inherently a high-risk endeavour. It may be that, above all, youth entrepreneurship education will succeed if it encourages the more risk-averse student to take more of a chance than he or she had previously imagined possible. "Natural born" entrepreneurs may leave their home communities if they cannot find the colleagues and workers to help them realize their vision – youth entrepreneurship education may be an important solution to "brain drain."

Many programmes also measure personal values and aspirations, as these may be affected by entrepreneurship education. For instance, before taking an entrepreneurship class, the majority of the students will probably answer "No" to the question, "Do you feel comfortable discussing your ideas to a roomful of strange adults?" One measure of success would be the number who answer "Yes" after taking the class. Another example: "Do you think you will graduate from college?" Entrepreneurship education can be judged by the increase in positive answers to this question, especially as compared to the "control" responses in other classes.

Psychologists call this area of mentality "the locus of self-control" and "self-efficacy." Entrepreneurship education, in ways not yet fully understood, leads to improvement in these areas, helping individuals move from passive beings who are acted upon to agents who act on their own behalf.

1.5 Case Studies

Umsobomvu Youth Fund and the Maths Centre for Professional Teachers, South Africa

The South African government established the Umsobomvu Youth Fund in 2001 to promote entrepreneurship, job creation, and skills development for citizens aged 18-35. The Fund reports to the Minister of Labour. The Fund has also partnered with the South African National Youth Commission, a policy-making body that reports to the Presidency, and with the South African Youth Council, an umbrella group representing some 60 youth groups.

Funded by the government, Umsobomvu had the foresight to include entrepreneurship in the forefront of its many offerings for youth. Umsobomvu finances many programmes, including a youth entrepreneurship initiative implemented by the South African Maths Centre for Professional Teachers, which in turn licenses materials and systems from the National Foundation for Teaching Entrepreneurship. After just a few years, the Maths Centre programme has grown to operations in six provinces, now reaching 17,000 youths annually. Economics and mathematics teachers trained by the Maths Centre instruct the youth entrepreneurship course in the classroom.

While it is too early to report long-term success, the Umsobomvu model and the Maths Centre implementation impress because of rapid growth, particularly the ability to reach young people in rural areas.

Success factors

- An explicit policy mandating and enabling youth entrepreneurship education
- Strong governmental support at the highest levels
- Close partnerships with multiple stakeholders
- A dedicated national funding source
- School teachers as implementers, integrating entrepreneurship into the core subjects of math and economics

The ICTA Project, El Salvador

In 2002, the American-based non-governmental organization TechnoServe partnered with the university sector in El Salvador to bring entrepreneurship education to 18-22 year-olds. TechnoServe's mission is to help "entrepreneurial men and women in poor rural areas of the developing world to build businesses that create income, opportunity and economic growth for their families, their communities and their countries." Working with nine universities, TechnoServe brought the National Foundation for Teaching Entrepreneurship in as a partner.

The vocational-technical college Instituto Tecnológico Centroamericano ITCA-FEPADE was especially responsive, and quickly offered youth entrepreneurship education in five sites across the country. The focus was on rural

growth and on creation of businesses. ICTA documented some 95 businesses started as a result of the programme, emerging from about 3,000 students trained. One of the features of the programme was a nationwide business plan competition.

Unfortunately, TechnoServe has been forced to scale back due to a loss of funding. The original TechnoServe support was backed by a USAID grant that was not renewed.

Success factors

- Strong commitment from the university sector, especially the vocational-technical college
- Strong commitment by administrators and teachers to experiential learning
- Clear focus on business formation
- Nationwide business plan competition as means to unify the programme and to improve student performance

Challenge:

- The lack of sustained funding – the programme has not been embedded in the baseline budget for education

Bright China Foundation, China

The Bright China Foundation was started in 2005, and is funded by Bright China Holdings, one of the largest private real estate concerns in the People's Republic of China. The Foundation focuses on education and economic development, taking a private-sector approach to benefit the public good. The Foundation runs many programmes, including a very prominent youth entrepreneurship education initiative.

The Foundation's youth entrepreneurship education programme has grown rapidly, and is today active in 11 provinces, reaching some 5,000 young people. The Foundation licenses materials from the National Foundation for Teaching Entrepreneurship. The Foundation has a good relationship with the vocational department of the Ministry of Education, but operates its own schools and deploys its own teachers in addition to working with teachers employed by the public school system.

Success factors:

- Strongly dedicated, motivated staff
- Ability to control the classroom setting and pedagogy
- Agile, quick decision-making
- Strong funding base
- Sustained expertise from the business sector

Aflatoun, International

Aflatoun is an organization whose mission is to socially and financially empower children to enable them to break the cycle of poverty. The organization started operations in 2005 targeting rural areas in developing countries; currently, about 14 countries in South America, Africa and Asia, are piloting the Aflatoun Programme Child Social and Financial Education, and about 200,000 children have been exposed to the Aflatoun concept.

In the Ugandan Aflatoun Programme (PEDN), children successfully set up small and profitable ventures. Children in the Aflatoun savings clubs produced recycled-paper bead necklaces and bracelets, wallets, baskets, dolls, cards and even made decorations out of used bottle tops as a waste management project. The products were sold at events like their end-of-year culmination events, Aflatoun Sports Days, or during other special events the children organized under the guidance of their teachers.

One student's comment on his micro-enterprise experience: "We had made our baskets, we went there [to Aflatoun's Culmination Event] … everybody wanted to buy them, they were expensive because we also knew that the baskets were nice looking. We knew everyone will want to buy them, so we put them at an expensive amount, and they bought them and we sold them at 20,000 [Ugandan Schillings] each!" He said this laughing.

At Tanyag Elementary School in the Philippines, children set up a small stationery store where they sold school supplies started with seed money provided by Aflatoun. The school allowed time in the morning before school started, and during breaks, for the children to set up and sell their products. Participating students coordinated the whole process – budgeting, purchasing, stocking and

selling at a profit. This money was divided monthly among the participating students. This small enterprise is a valuable achievement for the children. It is also useful because the school is quite far from the town centre where school supplies are sold.

At Gutad Elementary School in the Philippines, children using Aflatoun seed funding set up a chicken enterprise that turned into a school-feeding programme. In 2006, Aflatoun donated 18 chickens to students in the fifth grade. The children sold the eggs to the community stores and to their neighbours. Their profits were kept in their bamboo banks. By 2007, the chickens were laying enough eggs to be shared with children in younger grade levels and for the school to start its own chicken business for all the students. The profit generated from the enterprise, aided by financial donations and support from the Parent Teacher Council, has funded the cultivation of a rice field. The rice harvest is being used for the school's lunch programme.

In the Aflatoun programme in Argentina (*Ejercicio Ciudadano*), at the General Juan Sanchez #1240 School, seventh graders set up a store to sell school supplies such as pencils, erasers and notebooks. The students not only organized the purchasing and maintenance of the store, but also coordinated a schedule of rotating responsibilities for staffing the store. The students made profit of 472 Argentine pesos. These same children also set up a raffle of an airline ticket donated by a local travel agency. The Aflatoun children coordinated the donations, managed the raffle, and made a profit of 500 pesos. They used the 972 pesos for their class trip.

JA Worldwide (Junior Achievement), International

JA Worldwide (Junior Achievement) is a global organization providing entrepreneurship education programmes for students ages 6-25. In 2008, 9.3 million students were enrolled in Junior Achievement programmes across 120 countries. Local Junior Achievement offices work directly with educators in the school system and with volunteers from business and the community. Junior Achievement legacy programmes such as "The Company Program" are

recognized best practice by policy-makers the world over. The "What happened later?" studies conducted with Junior Achievement alumni in several countries have shown that entrepreneurial potential doubles with access to such programmes. Junior Achievement programmes are built around three pillars: financial literacy, skills for employability and entrepreneurship. Junior Achievement is supported by businesses, foundations, governments, aid agencies and individuals. Junior Achievement was founded in 1919.[11]

Junior Achievement (JA) works closely with governments. For example, Junior Achievement is the driver for a remarkably comprehensive and cross-sectoral initiative in Norway. The Norwegian government is deeply involved, via the ministries of education, agriculture, trade & industry, and through local governments and regional development agencies. The Confederation of Norwegian Enterprise, the association of savings banks, the national trade unions confederation, and many individual companies are also engaged. The vision outlined by JA and the government begins with primary schools and extends through the colleges and universities. In 2008, 79,000 students were enrolled; 20% of all secondary school graduates in Norway have participated in JA programmes. Most important are the long-term results: the level of entrepreneurial activity among students who have participated in the programme is at least double the norm for their peers.

1.6 Recommendations

Peter Drucker said it best decades ago: "What we need is an entrepreneurial society in which innovation and entrepreneurship are normal, steady, and continual" (Drucker, 2001).

To achieve this society, senior policy-makers, supported by leading entrepreneurs and senior corporate officers, need to:
- Require entrepreneurship education ("ownership literacy") in public schools, or, at the very least, make entrepreneurship education available as an option for all students
- Fund entrepreneurship educations sufficiently

- Revamp uptake and training of new teachers to include entrepreneurship education and to ensure that the pedagogy is experiential, action- and project-based, focused on problem-solving with practical application, and centred on the concepts of ownership and individual responsibility
- Encourage educational institutions to partner with business and law schools as well as other stakeholders from the public and private sector, on entrepreneurship education
- Mandate certification of teachers in entrepreneurship education
- Encourage formal, direct links between teachers and entrepreneurs, and between schools and companies, so that the theory and practice are intertwined
- Encourage and fund research on and evaluation of youth entrepreneurship education

Taking these actions will ultimately help keep the Jens Rasmussens and Andrea Smiths engaged with school by exposing them to the possibility of ownership.

Entrepreneurship in Higher Education

Courtesy of Cisco

CHRISTINE VOLKMANN, Schumpeter School of Business and Economics, Bergische Universität, Wuppertal

"An entrepreneur is a person who is willing and able to convert a new idea or invention into a successful innovation, simultaneously creating new products and business models largely responsible for the dynamism of industries and long-run economic growth."

Joseph A. Schumpeter

Why Is Entrepreneurship in Higher Education Important?

Competitiveness, innovation and economic growth depend on being able to produce future leaders with the skills, attitudes and behaviour to be entrepreneurial and to act at the same time in a socially responsible way. Entrepreneurship is not only about creating business plans and starting new ventures. It is also about creativity, innovation and growth, a way of thinking and acting relevant to all parts of the economy and society as well as the whole surrounding ecosystem. In this context the entrepreneurial ecosystem can be characterized as the interdependent and interactive framework for entrepreneurial activity. This interdependence comprises both institutional rules and environmental conditions that define the range of socially and economically viable entrepreneurial opportunities and the way in which entrepreneurs and other stakeholders shape these surrounding institutional and environmental conditions.

Creative, innovative and entrepreneurial people are essential for the creation of wealth and economic growth. Innovative entrepreneurs come in all shapes and forms. They start and grow companies; they spin out companies from universities or other organizations; they restructure companies in need of refocusing; they innovate within larger organizations. In developing entrepreneurial graduates, entrepreneurship education has a crucial role to play. It can be understood as a lifelong process which develops individuals' skills, attitudes and behaviours. It is important to start as early as possible at all levels of formal and informal education. It should be integrated into the education system of primary and secondary schools as well as higher and further education. For effective entrepreneurship education, the curricula over the years must be consistent and coordinated and entrepreneurship education should continue at higher education institutions.

Entrepreneurship programmes and modules can have various objectives, such as: a) developing entrepreneurial drive among students (raising awareness and motivation); b) developing the entrepreneurial ability to identify and exploit opportunities; c) training students in the skills they need to set up a business and manage its growth (European Commission, 2008). In all of these contexts, it is important to encourage students to think and act entrepreneurially as well as ethically and socially responsible.

By focusing on education for high growth and opportunity entrepreneurship, the World Economic Forum can address the increasingly important global issue of how best to spur economic growth in a socially responsible way. In many countries, cultural traditions and the lack of exposure to entrepreneurship as a viable career option can be barriers to innovation and economic growth. By raising awareness and building necessary skills at all levels of education, a new generation of entrepreneurially-minded people can unleash economic potential around the world.

A global study in this area would not only be the first of its kind, but it would also meet a tremendous need for sharing best practices and innovative new approaches to entrepreneurship education currently being tested around the world. Although the field is quite international, most studies to date focus on university entrepreneurship education in the United States and selected European countries (Rothaermel, et al., 2007). The World Economic Forum has an opportunity to build the evidence base from across the world and to share the lessons learned on a global level. This would be invaluable, not only to those currently involved in entrepreneurship education at universities and colleges but also to policy-makers and companies eager to encourage entrepreneurship education and economic growth.

Approach for Addressing This Chapter

Higher education institutions have become increasingly important for regional as well as national and global economic and social development. From regions such as the Silicon Valley and Cambridge, we can learn the value of bringing business and academia together. This leads to a new momentum of entrepreneurship in higher education. This chapter concentrates on entrepreneurship in higher education (university level) with a particular focus on high-growth entrepreneurship.

Globalization, the rapid development of technology and the lower cost of travel have completely changed the nature of work. Students, as an essential part of the future work force, have to deal with an increasingly complex and uncertain world due to profound economic, social and technical structural change. Indicators of these changes are shifts to service and knowledge-based economies, the rise of emerging economies as well as societal challenges such as environmental sustainability and aging populations. In addition, the explosive growth of social networks demonstrates that boundaries are less easy to define. This indicates that creating new conditions of work also requires new responses (Myint, Vyakarnam, 2005). It is a challenge for higher education institutions to prepare students to work in a dynamic, rapidly changing entrepreneurial and global environment. In this context there is a specific opportunity for high-growth entrepreneurship at higher education institutions.

Universities, especially technical universities, can be seen as engines of scientific invention and technological development. Invention and technological development can be transformed into innovation. Entrepreneurship is important as a diffusion mechanism to transform scientific inventions into new product and service innovations. Universities play a key role in promoting the talents of students, graduates and researchers. What distinguishes institutions of higher education from other institutions in society is their role in creating knowledge and producing high-potential graduates and researchers.

For entrepreneurship education, focusing on institutions of higher education offers the chance to develop knowledge-intensive high-growth enterprises from all academic disciplines, not just technical ones. Higher education institutions should create an environment that fosters entrepreneurial mind-sets, skills and behaviours across their organizations. Universities can teach students how to start and grow enterprises in ways that benefit society. Technical universities in particular provide potential breeding grounds for high technology and high-growth companies or "gazelles."

Entrepreneurship in higher education has grown significantly over the past 5-10 years, and strong growth is expected to continue. However, more needs to be done, particularly in the areas of curriculum development, training and development of teachers, funding of entrepreneurship, cross-disciplinary research collaborations and the facilitation of spin-outs from higher education institutions (Twaalfhoven, Wilson, 2004). In addition, universities play a key role as entrepreneurial hubs, connecting researchers, students, entrepreneurs, companies and other stakeholders.

It is important to involve stakeholders inside and outside of higher education institutions. For example, entrepreneurs and entrepreneurial leaders acting as role models for students should be an essential part of entrepreneurship modules and programmes. If we want young people and students to enter the business world and entrepreneurship it is necessary to involve business people and entrepreneurs in the academic education process.

Since academic start-ups grow faster than others, universities can obviously offer support in entrepreneurship education for high growth. In this context it is important to boost regional business potential and activities and to promote international networking and cooperation. Moreover, it is important to offer students techniques that can be applied in the real world. Therefore, a shift from classical models of teaching to experiential learning approaches is essential.

Entrepreneurship education at universities can be regarded as theoretically based real life experience. High-growth entrepreneurship can be seen as an adequate form of education for developing high potential students and graduates that can become future opinion leaders and perhaps role models.

The Importance of Education for High-Growth Entrepreneurship
Opportunity-based entrepreneurship, access to information and a broad market orientation in the start-up phase distinguish entrepreneurs of future high-growth firms from low-growth firms. All over the world, numerous innovative new enterprises have recognized the entrepreneurial opportunity and achieved a profitable high growth. The economic and social benefits of young growing enterprises have been repeatedly demonstrated by research, especially with regard to employment, stimulation of innovations, industrial dynamics and regional development.

Studies show that only a relatively small proportion of all new firms are high-growth firms, which generate the bulk of new jobs. A fundamental question is what is required to start and develop a high-growth enterprise like Apple or Genentech. For these enterprises, entrepreneurial growth is easy to verify retrospectively. But how can new ventures with growth potential be selected in advance? Moreover, entrepreneurs must understand the growth processes and the factors most likely to generate growth for different types of firms.

Research on successful and unsuccessful new and young growing enterprises can aid understanding of growth processes and barriers to growth. Research on of how the growth of new enterprises can be better supported, particularly through education at colleges and universities also would be useful. Hence, all over world increasing attention is being paid to the potential of university education to facilitate high growth enterprises. For example, research has demonstrated that high-growth entrepreneurs in Europe are better educated than other entrepreneurs and the general population. In Europe, most founders of technology-based enterprises have a university degree. Research carried out in Germany has shown that enterprises started by individuals with university degrees tend to grow faster than enterprises founded by non-academics (Egeln, 2000).

Research is also needed on how to motivate and nurture the entrepreneurial potential of female students who traditionally may be less inclined to found and manage innovation-oriented high-growth firms (see Sternberg, et al., 2004; Fleissig, Piorkowsky, 2005; also cf. Carter et al., 2003). Another group of specific interest are ethnic and immigrant entrepreneurs, who – though often not innovative in the beginning – may introduce novel business practices and subsequent product and service innovations within established communities (cf. for example, Ley, 2006).

Universal antecedents of start-up behaviour displayed by different groups of society and success factors for high-growth enterprises are hard to determine due to the heterogeneity of technology sectors and individual development paths. The strength of entrepreneurship education ,however, is to influence people's attitudes towards entrepreneurship and the prospects and feasibility of becoming a growth entrepreneur.

Entrepreneurial activities of university students depend to a large extent on perceived barriers to and support for new venture creation. "A perceived lack of relevant experience and a lack of self-confidence" are two reasons often cited by students and new graduates for not engaging in entrepreneurship after graduation (European Commission, 2008; also see

the recent empirical studies by Linan, 2008; Guerrero et al., 2008). The perception of graduates as to whether founding one's own business is desirable personally and socially also impacts entrepreneurial activity (Krueger 2000). Hopefully, entrepreneurship education can lower barriers by generating awareness and motivating students to start new ventures.

2.1 Characteristics of Entrepreneurial Activity

2.1.1 Definition and Characterization of High-Growth Enterprises

High-growth enterprises generate new jobs and often new products, services and markets. These enterprises are frequently built on and related to innovation. Entrepreneurial activity is often based on fundamental technologies like genetic engineering or, earlier, microprocessor technology (for example, Freeman, Louca, 2001; see also the list of global challenges and the technologies related to them in National Academy of Engineering, 2008). Entrepreneurship functions as a transformation and diffusion mechanism to turn technical and scientific inventions into product or service innovations contributing to structural economic change and growth (see Carree, Thurik, 2003; Acs, Audretsch, 2003).

Enterprise growth can be defined in quantitative and qualitative terms. Quantitative growth comprises the increase of measurable variables (e.g., turnover, profit, employees, etc.). These are prominent and important target measures from the perspective of enterprise policy-makers (OECD; Ahmad, Seymour 2008). However, because of typical sector-specific heterogeneity, qualitative criteria will also be important for defining (high-growth) entrepreneurship and small business (Curran, Blackburn 2001). Qualitative growth is more difficult to measure. It can be defined as a qualitative improvement of the input or output of an enterprise. Examples are an improvement of the product quality or the quality of customer relations, the quality of work places created or management competences as well as sustainability in the enterprise development.

Young high-growth enterprises are typically referred to as "gazelles." According to Birch, gazelles are enterprises that have achieved an annual employment growth rate of at least 20 % (Birch, 1979). The Growth Company Index (GCI) of the National Commission on Entrepreneurship (NCOE) in the United States defines high-growth firms as those that have achieved at least a 15 % annual employment growth over a period of five years. In addition, the GCI identifies high growth ventures as those that hired at least 20 employees within five years following their founding date (NCOE, 2001).

As can be seen in the table below, most definitions of high-growth enterprises have their origin in the United States (Volkmann, Tokarski, 2006).

Growth does not occur automatically. Important success factors are the entrepreneurs, their teams and their growth strategies.

Table 3	Definitions of High-Growth Enterprise (Gazelles)
SOURCE	**DEFINITIONS**
Birch (1979)	Annual growth rate of employment at least 20%
Eisenhardt, Schoonhoven (1990)	Annual turnover growth of 20% or higher
Siegel/Siegel/ MacMillan (1993)	Increase in the turnover of at least 25% in each of the three preceding years
Babson College [quoted in Timmons (1999)]	Turnover growth of 30% per year and turnover of at least US$ 1 million
National Commission on Entrepreneurship (2001)	High growth in staff numbers of at least 15% per year over five years or 20 employees within five years after founding. [Part definition of the Growth Company Index (GCI)]
Kauffman Foundation [quoted in Dowling/Drumm (2003)]	Increase in the turnover of at least 30% or increase in staff numbers of at least 20% in the three preceding years
Barringer/Neubaum/Jones (2005)	Yearly growth of turnover of at least 80% over three successive years

Differences between Growth Enterprises and SMEs
Since the early 1980s, interest in entrepreneurship and the small business enterprise has been growing all over the world. During the first decades of the 20th century, small businesses were both a vehicle for entrepreneurship and a source of employment and income. From a historical point of view, European research focused on small businesses has a longer tradition than research centred on entrepreneurship.

More recent research differentiates between growth-oriented entrepreneurship and small- and medium-sized enterprises (SMEs), not all of which are growth-oriented (Wilson 2007). Entrepreneurs are conceptualized as agents of innovation and growth. Some new enterprises achieve high rates of growth and have an important economic impact on their

regions and beyond. These enterprises differ from those which grow less dramatically, or not at all. However, for entrepreneurship education initiatives it is important to appreciate that some business founders begin with non-entrepreneurial intentions and little growth aspiration, but that their ventures grow rapidly later on in the process (Jenkins, Johnson 1997). Examples of such enterprises with an initially only local footprint and very small capital base may be found even among now major companies like HP and Microsoft (Bhide, 2000). Here, entrepreneurship education must offer advanced training programmes for those who started a small business that later has become a rapidly growing entrepreneurial business (for example, training in post-graduate level MSc or MBA programmes with an entrepreneurship focus). This education of "company builders" (in addition to company founders) is of particular importance to the area of high-growth entrepreneurship.

Any business, even a small business venture, must focus on turnover and profit in order to survive. An entrepreneurial venture also focuses on growth. Most non-entrepreneurial small business ventures do not (or very little) focus on growth and much more on profit. It is therefore important to distinguish not only the small business venture from growth firms but also the entrepreneurial firm from the non-entrepreneurial enterprise. Entrepreneurship and small businesses are important where they coincide. This is the sector of new small and often fast-growing businesses.

Implications of High-Growth Enterprises

Research illustrates that all over the world high-growth enterprises represent only a small percentage of all entrepreneurial activity and that the job creation potential is highly concentrated. In this context, the findings of a Global Entrepreneurship Monitor (GEM) study on worldwide high-growth entrepreneurship are of interest. The study (covering 2000 to 2006) shows that less than 2 % of the so-called nascent entrepreneurs (who have taken tangible action to start a new venture during the last 12 months) and new entrepreneurs (who have founded their business within the last 42 months) expect to create more than 100 jobs within a period of five years. Nascent and new enterprises that expected to create 20 or more jobs within five years represented only approximately 7 % of the total population.

However, the patterns of entrepreneurial growth expectation do vary across the regions of the world. According to the GEM study, North America shows the highest level of expectation regarding high-growth entrepreneurship, whereas the EU and highly developed Asia (including Japan and South Korea) have the lowest rates. Among the low-income regions, Africa and South America have low levels of expected high-growth entrepreneurship, whereas developing Asian countries (including China and India) show a high level of growth expectation (Autio, 2007). The GEM study is based on the initial expectations and estimations of early-stage entrepreneurs and experts. It would be interesting to know to the extent to which these results match the actual performance of high-growth entrepreneurship activities and the jobs generated by them.

Europe in particular faces the problem of not having enough gazelles. According to a 2002 Eurobarometer survey, Americans were involved in three times as many new entrepreneurial ventures than Europeans. European firms generally start smaller, grow more slowly, and die faster than their counterparts in the United States. It seems that Europe has difficulties in stimulating fast growing companies. For example, research shows that new companies in the US grew around 60 times their initial size in the seven years following their formation. Comparable figures for the EU are just 10 times for Germany and five times for France. In addition, the largest EU enterprises were predominantly formed over 50 years ago, while in the United States and also in the emerging economies many large firms are more recent arrivals (Conference on the European Charter for Small Enterprises, 2008).

2.1.2 Target Groups

Objectives and Target Groups of Entrepreneurship in Higher Education

For a university or college it is essential that the goals of its entrepreneurship education form part of its wider mission. Depending on their specific mission and strategic orientation, universities and colleges can pursue different aims, both in their general entrepreneurial training and with regard to the practical design of their curricula.

Generally, during the early phase of the studies sensitizing students to entrepreneurial thinking and acting is emphasized. One focus can be to sensitize students that creating a new venture can be an alternative to employment. It is important to raise awareness and generate motivation for the discipline of entrepreneurship. Strategically, two target groups may be addressed; first, entrepreneurship education in "a wider sense" and entrepreneurship education in "a narrower sense" (Koch, 2003). The former entails offering courses to students who will be involved in catalysing entrepreneurship in their future employments. Raising the awareness and understanding of the specific needs of new enterprises in novel technology sectors (for example, venture capital and market acceptance of product innovation) will be the essential catalyst here.

Entrepreneurship education in the narrower sense follows a direct approach, developing students' competences and entrepreneurial intentions towards starting a business as a career option. In particular, interested students can be

offered suitable modules or events for qualifying in different entrepreneurial fields of competence in order to deepen their knowledge in the further course of their studies. With this in view, it is essential to train students in the skills they will need to develop the entrepreneurial ability of creating business ideas, identifying and recognizing opportunities, setting up a business and managing its growth. Students must be prepared "for a life world of much greater uncertainty and complexity involving frequent occupational, job and contract status change, working in a world of fluid organizational structures, greater probability of self-employment and wider responsibilities in family and social life" (Gibb, Hannon 2006).

Taking a broader view, it is important that universities and colleges focus on the aspect of implementation and commercialization of inventions and research. Therefore, generating start-ups and spin-offs with substantial growth potential out of the universities is also an objective, especially at technical universities. However, the target groups of entrepreneurship education and a support infrastructure for new venture development at universities should not be constricted by addressing only technical faculties. Rapid growing service businesses may emerge from other disciplines, sometimes on the back of technologies like the Internet. In this context, students and other university members from different disciplinary backgrounds should learn to believe in their ability to create a new venture., One aim is to develop self-confidence and responsibility. A supportive learning environment for entrepreneurship education is essential.

Business formations do not regularly take place directly after the completion of one's studies. Graduates often prefer to gain practical experience before they start their own businesses. The systematic setup of alumni organizations to facilitate sustained contact with graduates is of special importance, in particular to perpetuate awareness that entrepreneurship is a viable career option. A particular challenge will be to address the substantial opportunity costs of becoming an entrepreneur within the group of high potential university graduates with excellent employment prospects (Wiklund, et al., 2004).

The central goals of entrepreneurship education at European universities and colleges are usually the development of entrepreneurial capacities and mindsets and the promotion of the social recognition for entrepreneurial initiatives (European Commission, 2006, 2008). In North America, the emphasis lies more strongly than in Europe, especially Eastern Europe, on the implementation and commercialization of innovation, knowledge or research and the associated generation of income. High rates of innovation and growth are seen as attainable mainly through start-ups and spin-offs out of the university. In the United States, an entrepreneurial culture is essential for encouraging and supporting students and the faculty in launching high-growth ventures.

However, in many other countries the generation of, or the transformation into, an entrepreneurial culture is still a strategic process, which can be encouraged by the development of entrepreneurial competence at a university or college. Although entrepreneurship education is still at a beginning stage in China, initial progress has been made. According to a study among 30 Chinese universities and colleges only 17 offer entrepreneurship courses and only 6 include entrepreneurship courses into their main curriculum (SAPECG, SIFT, NCGE 2006).

Innovative goals and methods in entrepreneurial education are not directed towards the augmentation and reproduction of knowledge, as the solving of entrepreneurial tasks does not consist in routine and standard activities. The entrepreneurial environment, characterized by complexity and insecurity, requires capabilities for solving new problems and challenges by acting independently and taking responsibility.

The target group of entrepreneurship education at universities and colleges is formed primarily by students of all specialized areas or faculties. There is also the possibility of offering teaching modules for entrepreneurial qualification, for example, advanced study courses to potential founders, male and female entrepreneurs, and executive employees. Apart from students, other members of the universities, such as scientific staff, administrative employees and professors, in particular in the areas of technology and science, can form a target group. Many new enterprises founded by

professors shows that this group has entrepreneurial potential. Professors regularly have research results at their disposal that are insufficiently exploited in the market. While the stability of life-long university employment may be a formidable barrier to the development of entrepreneurial ambitions (Chiesa, Piccaluga 2000), professors can play a major role as supporters and facilitators of new venture projects initiated by junior faculty members and graduate students (Isfan et al., 2005 for the context of university personnel in Germany).

Professors might be encouraged to play this role through faculty-specific coaching programmes, which recognize the commercial prospects of scientific discoveries and help exploit such opportunities (e.g. by offering their industry contacts or providing laboratory space and time for product development and venture planning).

2.1.3 Driving Forces

Historical Context and Characteristics of Entrepreneurship in Higher Education

The convergence of globalization, technological innovations, knowledge-based economies and demographic trends has led to an increased focus on the effects and importance of entre-preneurship. Entrepreneurship is seen as a driving force of economic development, structural change and job creation. Special importance is attached to high potential start-ups and high-growth firms contributing to the growth of a national economy (Autio, 2007; Wong, et al., 2005; Friar, Meyer 2003). In order to develop a new venture, growth motivation, opportunities and resources are essential. Growth motivations are strengthened by a high level of education, experience and environ-mental dynamism (Wiklund, Shepherd, 2003).

Along with the growing status of entrepreneurship is an increasing interest in entrepreneurship education, especially at universities and colleges. From the academic point of view, entrepreneurship is both a teaching subject and a research object. Universities are facilitators of an entrepreneurial culture, mediators of skills, attitudes and behaviour as well as an engine for regional business development and growth. For some time, numerous universities and colleges in various countries have invested and contributed a considerable amount of effort in providing appropriate entrepreneurship education courses and training, which have helped this discipline to develop and gain momentum. As a result, both the demand and the supply of entrepreneurship programmes and modules have markedly increased at universities and colleges in most countries all over the world.

Through the development and promotion of entrepreneurial competences at universities and colleges, policy-makers expect a stronger entrepreneurial initiative among the students as well as the formation of innovative, growth-oriented enterprises as spin-offs from the universities. Economic objectives include the creation of new workplaces, the generation of economic growth as well as globally competitive national economies. Therefore, policy-makers of many countries, especially where state universities and colleges predominate, have generated and developed various initiatives to promote entrepreneurial activities at universities and elsewhere in their regions.

Supporting measures include financial support for projects or spin-offs from universities and for infrastructure, such as innovation centres, incubators, science parks and technology transfer offices. It is not possible to discuss here in depth whether governments should be involved in the financial support of new venture creations, high-growth firms and entrepreneurial activities. However, there can be no doubt that government policy should create an enterprise-friendly framework that encourages the emergence and growth of enterprises.

An increasing number of university officials also have recognized the economic significance of entrepreneurial education and, in particular, of spin-offs for universities and colleges. This has been true for some time in countries where universities and colleges primarily finance themselves privately and are therefore in a position to make investments in enterprises (for example in the United States, Canada, Australia). However, as countries where state universities and colleges predominate are increasingly forced to retrench their expenses, and universities and colleges subjected to budget constraints have to look out for new ways of financing, entrepreneurial and commercial university initiatives will also gain in importance. At the same time, the benefits with regard to finances and reputation for the university and the faculty from which new business have evolved, and finally for the national economy as a whole can be considerable.

A well-known example of entrepreneurial education and high founding intensity among the students is Stanford University. Its successful alumni include William Hewlett and David Packard, whose first product, an audio frequency oscillator built in a garage in Palo Alto in 1939, constituted the nucleus for the company Hewlett-Packard.

The garage has for decades been regarded as the birthplace of the Silicon Valley phenomenon. Larry Page and Sergey Brin, two students at Stanford, co-founded Google in 1998. The initial public offering took place in 2004. These two success stories have not only had a positive effect on the reputation of Stanford University, but have also led to considerable income, for instance in the form of donations from the Hewlett and Packard families to the university, and possibly also through the initial public offering of Google (Weiler, 2004).

The origins of entrepreneurship education at universities and colleges lie in the US, where the first MBA course was introduced in 1947 at Harvard Business School under the title "Management of New Enterprises" (Katz 2003). In the early seventies, a dynamic development process started and continues today. From the 1980s onwards, entrepreneurship education spread first to northern Europe, then around the mid-1990s to Central and Southern Europe and to the rest of the world.

Internationally, North America is a role model with regard to high-growth enterprises as well as the leader in entrepreneurship education. No one questions the enormous economic contribution of Microsoft, Amazon, Intel, Cisco or Google and many other innovative high-growth firms in the United States. Compared with other countries, the United States has the longest history in entrepreneurship education, and also one of the most entrepreneur-friendly cultures and structural conditions in the world.
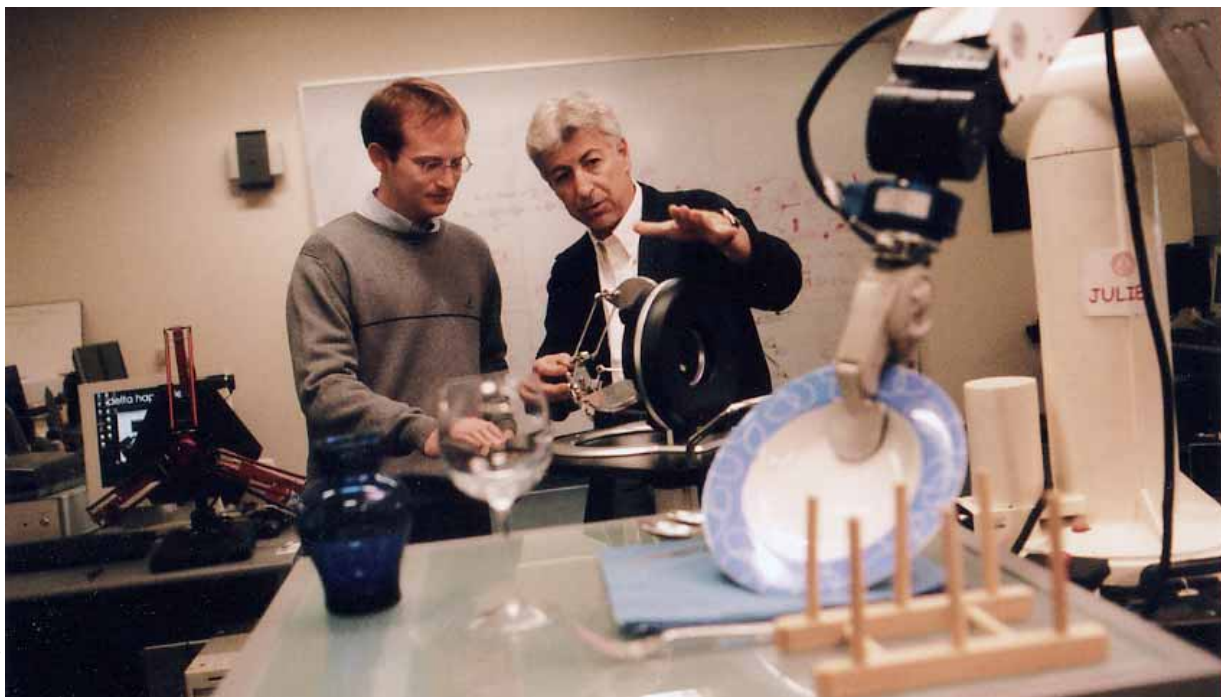
Courtesy of Intel

An entrepreneur-friendly culture includes a certain tolerance towards entrepreneurial failure. The annual Global Entrepreneurship Monitor study (GEM), an assessment of the entrepreneurial activities of more than 30 countries, shows that the United States has a low failure index. This implies that in the United States entrepreneurs are allowed to fail, recover from their failure, and get at least a second chance and often more to rebound. In this sense failing is part of the educational process of becoming an entrepreneur. It is concerning that elsewhere the tolerance and acceptance of entrepreneurial failure is less supportive. The fear of failure as an obstacle to starting one's own business is particularly pronounced in German-speaking countries, as is the stigmatization of business failure (EOS Eurobarometer, 2002 ; Kourilloff, 2000).

In this report, we start with the basic assumption that there is a positive relationship between entrepreneurship education and the generation of growth enterprises, even if there is still a lack of research-based evidence with regard to how and to what extent entrepreneurship in higher education contributes to the creation of new high-growth ventures and economic growth. We also assume that entrepreneurship can be taught and learned at universities and colleges.

Entrepreneurship is "not magic, it's not mysterious, and it has nothing to do with the genes. It's a discipline. And like a discipline, it can be learned" (Drucker, 1985). The quotation from Drucker illustrates that the question whether entrepreneurship can be taught and learned is no longer relevant. The general consensus is that entrepreneurship education constitutes an essential contribution to the development of an entrepreneurial culture in countries, regions and educational institutions. This culture is not only the breeding ground for new enterprises, but also the basis for entrepreneurial thinking in other contexts, in particular entrepreneurial activity in large mature business corporations. Here, innovation and venturing activities by "intrapreneurs", that is internal entrepreneurs (Burgelman, 1984) may help to revitalise established but inertial large companies (Morris et al., 2008).

These two facets of entrepreneurial activity in the self-employment and business administration contexts can be addressed in university education with mutual benefit as shown, for example, at the University of St Gallen, Switzerland, which caters to both future managers and entrepreneurs. Overall, developing entrepreneurial mindsets via entrepreneurship education at universities and colleges can improve the image and the standing of entrepreneurs and intrapreneurs in society, an improvement needed in many countries of the world.

The overall objective of this part of the report is to analyse why entrepreneurship education for high growth at universities is important and to what extent it is an integral part of higher education across nations. In addition, a country or individual may draw inspiration from examples of good practice or initiative. Research shows that the extent and intensity of entrepreneurship are decisively influenced by the prevailing political, legal, cultural, economical and technological conditions of a country or society that support or inhibit entrepreneurial activity (Autio, 2007).

Fostering rapidly growing, often technology-based, start-ups may demand a more specific entrepreneurial infrastructure because of the unique characteristics of high-growth entrepreneurship. Such start-ups require a more elaborate resource base than newly founded small businesses. Often entrepreneurs need to assemble this resource base almost from scratch, making external resource support the most important driving force (Brush, 2001). In particular, high-growth entrepreneurship with its substantial demands for external finance will require efficient segments of a country's capital market to provide venture capital at various stages of new venture development (for example, ranging from pre-founding seed capital to expansion and pre-IPO bridge financing). This entails venture capital and informal sources such as business angel financing.

Another prerequisite for a vibrant high-tech sector with rapidly growing start-ups is the availability of highly skilled human resources, especially in the areas of engineering and science (Shane, 2003). Here, both scientific know-how and capabilities in technology management will be needed.

The availability of this know-how relies on the strength and configuration of higher education and the prevalence of core and auxiliary high-tech industries within a country's national innovation system (Audretsch et al., 2005).

Finally, the importance of supportive formal and informal institutions for new business formation in general (GEM, 2006) is amplified for high-growth start-ups. Bureaucratic and legal institutions regulating the establishment of high-tech start-ups will be of importance (for example, incorporation procedures; building permits for laboratories or factories; regulations for hiring foreign technology experts) (Ho, Wong 2005). A practical example of possible inhibitive effects of extensive state regulation of emerging technology fields is the establishment of disease management and e-health start-ups in Germany (Koch, Gruenhagen, 2008).

As for informal institutions, societal norms and individuals' attitudes relating to risk-taking behaviour will play a role since high-technology venturing is risky and uncertain. This makes positive attitudes towards entrepreneurship in the population a sine qua non and in turn presents important challenges as well as opportunities for (higher) education to foster high-growth entrepreneurship.

In particular, university leaders may envision barriers implicit in transforming their organizations into entrepreneurial universities. Having said this, this metamorphosis also offers ample opportunities to grow existing but still scattered and isolated intrapreneurship and entrepreneurship education efforts into a novel overall mission of the entrepreneurial university. This offers the chance for university organizations to function as an even more powerful engine of regional development and valuable partner in university-business links and public technology transfer.

2.2 Opportunities and Challenges

Opportunities and Challenges in Entrepreneurship Education for High Growth: The Entrepreneurial University
In a global world, characterized by dynamic change, complexity and uncertainty, universities and colleges face numerous challenges. The increasing national and international competition to win students, scientists, research funds and other sources of income as well as rankings and reputation, is of particular interest. These changes demand from universities and colleges an entrepreneurial orientation with increasing market orientation and a stronger self-reliance, which will be associated with considerable opportunities, but also risks.

In the future many institutions of higher education will be increasingly confronted with new challenges, such as recognizing and exploiting opportunities for cultivating a competitive profile, utilizing resources more effectively and efficiently, and improving learning processes for themselves and their stakeholders. In light of these dynamic developments and challenges, there exists a broad consensus that universities have to become more entrepreneurial (Gibb, 2005). However, opinions differ as to the definition of the term "entrepreneurial university."

To understand why individual universities – for example, Stanford University and Arizona State University in the United States, and the University of Twente, the University of Strathclyde and the TU Munich in Europe – are identified as entrepreneurial universities, a more considered approach is required which takes into account diverse influencing factors inside and outside the universities. At the same time, universities and colleges in question must also be seen within the context of their own individual historic development and regional environment.

For some years individual universities have been following an international expansion strategy in the manner of entrepreneurs by, for example, founding their own campuses in other countries or entering into partnerships and strategic alliances. INSEAD, one of the leading French

business schools, has used its trade name and established a campus in Singapore. Another example is the University of Nottingham, England, which established a campus in Ningbo, China (Yusuf, 2007).

Although it is not possible to carry out a detailed analysis of the success factors of individual universities in this report, the generally accepted view is that it is crucial for universities and colleges to transform from administrative into entrepreneurial institutions. In a groundbreaking book "Creating Entrepreneurial Universities: Organizational Pathways of Transformation", using examples of five European universities, Burton Clark describes how this transformation process can be managed with five central elements he considers essential for an entrepreneurial university (Clark, 1998). According to Clark, the core elements of an entrepreneurial university are: a strengthened steering core with a clear vision and mission, boundary spanning structures and mechanisms to interact with the "outside" world (external stakeholders), a diversified funding base (less state funding), inter- and multidisciplinary activity and an integrated entrepreneurial culture.

However, on the way towards becoming an entrepreneurial university such elements may be initially lacking[12]. It is a challenge for universities and colleges to become more entrepreneurial themselves, reflecting the business sector with which they must interface.

As the final element, Gibb underlines the personal entrepreneurial developments of students and staff. It can be argued that universities are entrepreneurial when they "accept wider responsibility for the personal development of students and staff, particularly with respect to future social, career and life long learning experiences" (Gibb, 2008). In this sense it is a challenge but also an opportunity for all university members to contribute to the development of student talents in the field of entrepreneurship. Moreover, the university itself becomes a learning organization open to learn from all stakeholders at all levels.

At the same time, stakeholders may benefit from the pool of scientific knowledge at universities as well (see the section on shaping university-business links below). An interesting example is described in Duke (2001) who discusses a case study on the change of the University of Western Sydney towards a more open and entrepreneurial organization. This change involved redefining the university organization as a "networking university." This is an important characteristic of an entrepreneurial university because of the essential roles of knowledge exchange and relations to external stakeholders such as university-business links.

In the future many countries may give their state universities greater institutional autonomy to become more open and entrepreneurial. This happened, for example, in North Rhine Westphalia, Germany, in 2007 on the basis of a law regulating the freedom of universities and colleges. This also means that traditional state universities will be increasingly challenged to organize themselves on a more diversified funding base. Private fund raising as well as the commercialization of intellectual property will gain greater priority. In the future it will become increasingly important to identify and to promote possible start-ups or spin-offs from universities and colleges at an early stage – especially those with a high growth potential. Entrepreneurship education for high growth will of particular relevance, and a main challenge for the universities will be how to maintain scientific quality and strength.

Academic leaders of universities will face new demands. A cultural change towards an entrepreneurial university or college is taking place and must be seen within the context of the regional environment of the individual institution. The idea of an entrepreneurial university implies an accepted responsibility for local and regional development. New universities and colleges as well as other culturally open, flexible and innovative educational institutions should find it easier to establish an entrepreneurial culture than traditional universities and colleges where the preservation and maintenance of existing rigid structures and power relationships are at stake. In traditional institutions the implementation of the

12 See Degroof, Roberts 2004 for an account on how "weak entrepreneurial infrastructures" for academic entrepreneurship may be overcome. In particular, spin-off policies concentrating on resource support of selected venture projects seem to improve growth potential better than low selectivity/dispersed support policies.

concept of entrepreneurship education for high growth or even the introduction of entrepreneurship programmes may meet with resistance of some faculties and departments. Experiences in many countries illustrate that there is still a considerable challenge in establishing entrepreneurship education throughout the university sector (Schramm, 2006).

The idea of an entrepreneurial university or college is associated with both considerable opportunities and risks. In the future political pressures likely will be exerted to put them into practice. However, the potential risks must not be neglected. For example, there may be a risk if a university or college bases its public profile on economic opportunity rather than scientific quality. This would mean that a certain autonomy vis-à-vis the state is achieved, but new dependencies created by replacing the state with private providers of finance.

The concept of this risk is not abstract and theoretical, but has already been well supported in the literature with analyses concerning the commercialization of the higher education system (Bok, D. Universities in the Marketplace: The Commercialization of Higher Education 2003). According to this study, leading entrepreneurial universities and colleges chiefly distinguish themselves from average institutions by taking on a commitment for scientific excellence as well as for maintaining academic values and following ethical guidelines. This commitment should be observed and practiced by all members of the organization. These leading entrepreneurial universities and colleges further distinguish themselves through a marked performance orientation as well as a clearly recognizable profile based on their scientific strengths. The commercialization of inventions or innovations originating in these universities is then achieved on the basis of an ethical value system with a claim of creating value for society.

Under these circumstances many universities will find themselves in a situation of conflict between the growing pressure towards commercialization and gain orientation on the one hand and the wish to fulfil their claim for academic quality on the other. It is encouraging that

university faculties may be able to attain a balance between entrepreneurial performance and quality of scientific output (Van Looy et al., 2004). Keeping this balance may also help to address two typical concerns of faculty members – fears of declining public funding and academic freedom (Lee, 1996). Faculty policies targeted at this balance should be supported by the university's mission and top-management policies as depicted in the figure below that captures possible ingredients of the entrepreneurial university.
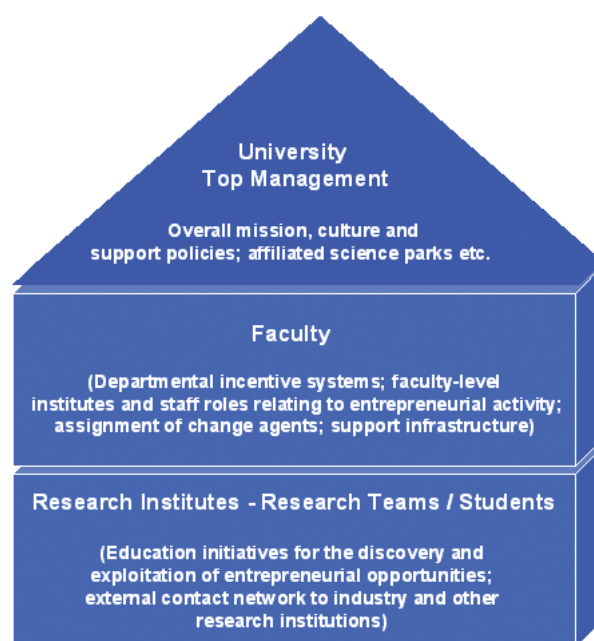
To summarize, the realization of the concept of an entrepreneurial university or college requires entrepreneurial, responsible and competent leadership, the mobilization of all members of the institution towards the common goal, and the bonding of all stakeholders in the regional environment. Achieving this aim will also require the readiness to carry out structural and personnel changes. It is argued that the process of transition will be smoothed by the attraction of entrepreneurial staff and of those who share the vision of a wider role of university in society. A good example in this context is the University of Illinois, where a university-wide audit was carried out to identify potential change agents and champions (Mendes et al., 2006).

The Role of Universities in Facilitating Regional Development

When studying the economic development of regions, a question frequently raised is why certain regions grow and achieve prosperity while other regions stagnate or shrink and suffer high levels of unemployment. Other issues in this connection are whether systematic regional development (for example industrial clusters) is possible and what contributions universities can make, for example by university start-ups or spin-offs. A range of literature has already tried to answer such questions from various points of view, arriving at a variety of conclusions (for example, Yusuf, Nabeshima 2007, Etzkowitz 2002, Saxenian, 1996, 2006, DiGregorio, Shane, 2003).

An expanding literature describes how universities are attempting to engage with industry while sustaining their academic mission. In this context, the dissemination of knowledge and innovation generated in universities and colleges is considered as a key driver for national and regional economic growth. There are increasing demands on universities to contribute more substantially to local economic and social development.

Various approaches to explaining the phenomena of Silicon Valley and Route 128 in the US and the Cambridge Technopole in the UK show that entrepreneurially oriented universities with commercially oriented research, intellectual eminence and an availability of venture capital have played and will continue to play an essential role in the economic development of regions. Gibbons, for example, emphasizes the close relationship between the scientific excellence of the universities in the region of Silicon Valley and the industry (Gibbons, 2000).

Another essential factor is seen in the regional culture in Silicon Valley. There the entrepreneurial as well as the academic culture are both characterized by a unique mixture of competition and collaboration with open, flexible decentralized and specialized structures (Saxenian, 1996). The phenomenon of Silicon Valley is also explained by spatial proximity permitting direct exchange of knowledge and experience between network partners, and by the cultural affinity of enterprises and universities with

compatible value concepts and behaviour patterns (Weiler, 2002). On this basis it can be generally assumed that particularly in the seed and early stage phases of an enterprise, the social capital of the entrepreneurs strongly influences their location decision.

The Importance of University-Business Links

The evolution of the relationships between universities, business sectors and governments follows different paths according to the level of development, historical and institutional traditions as well as to the respective contexts of the individual countries. Irrespective of these differences, research-oriented and technical universities have generally become more significant players in the processes of invention, innovation and commercialization as well as in the collaboration with business partners. In line with this evolution, the impact of university-business links on the economic development of regions and nations is the subject of a growing body of academic literature (for example, Wright, 2007; Mowery, 2005; Wu, 2007).

In this context, of interest is the question of the importance of entrepreneurship education for university-business links. Also of interest is to what extent an entrepreneurial university can make a contribution to the creation of high-growth ventures and thus to the economic and social development of its region. A study by Charney and Libecap (2000) has shown that entrepreneurship education contributes to the creation of new ventures as well as to their growth and promotes knowledge- and technology-transfer from university to industry. However, there is still a lack of research focused on the influence of entrepreneurship education on the development of links between the university and the business sector (Nelson, Byers, 2005).

In the United States, Great Britain, Ireland, Sweden and Japan, universities have been collaborating for many years with private enterprises to develop research programmes with commercial perspectives. Late starters such as China, India and Singapore have set the stage for the emergence of university-business links through their higher education strategies. For example, in the late 1990s the Singapore government started to accelerate the development of significant university-business links, particularly in the field of life sciences. Based on government strategy, the National University of Singapore has initiated a strategic change to become more entrepreneurial, and identified life-sciences as a major focus for commercialization (Wong, 2007).

Another example is Japan, which introduced the Basic Law for Science and Technology in 1995. Based on this law, the government initiated a multi-annual graduated scheme to promote university-industry links. Some Japanese universities, such as the Tohoku University in Sendai, became transfer agents of knowledge and technologies within their regions. It is noteworthy that the Tohoku University was already attracting private research funds in the 1920s. Its history includes a large number of patents and commercial successes; in Japan it has gained the reputation of an entrepreneurial university (Jiang, et al., 2007).

Across the world, a number of government initiatives have been developed to stimulate links between universities and businesses. Some examples include:

- Incubators and innovation centres
- Enterprise-university hubs and science parks
- Support of collaborative innovation and research
- Funds for the development of university spin-offs and commercialization
- Support of entrepreneurship and network programmes

Many individual universities have set up innovation centres and incubators to nurture enterprises that can be spun off, sometimes with the support of venture capital provided by the university or with the help of university connections. For instance, the University of Cambridge played a crucial role in the development of the Cambridge region as a leading life science hub in Europe. Science parks, often supported by national and regional governments, are helping to develop industrial clusters in the vicinity of universities.

Around the world many initiatives have been introduced to support collaborative research and innovation between universities and industry. One example is the Centre for Integrated Systems at Stanford University[13], a centre for applied research and the training of a new generation of scientists, in which 19 high-tech firms from the Silicon Valley participate.

Commercialization of University Innovations

Bringing innovations to market has not been the main historical role of university researchers. In Europe, the commercialization of research and innovations by publicly funded institutions such as universities has been regarding as ethically dubious since the end of World War II. However, in recent years the role of universities has been changing, mainly as the result of pressures exerted on universities to contribute to economic and social development and to opportunities for the creation of personal wealth (Etzkowitz, 2003). Historically, individual universities in the United States pioneered in the collaboration with industry and the commercialization of university research and innovation. In recent years, many other (particularly Asian and European) countries have started to make investments in university research, commercialization and general interaction between academic researchers and industry.

One essential precondition for the commercialization of university inventions and innovations is a legal framework that stimulates patenting of university inventions. (A good example of how this may be fostered in an emerging economy like India may be found in Indian National Knowledge Commission, 2008.) Patenting and licensing can have a positive result on the financing of the universities as well as on the links between university and industry. It is therefore important to recognize and capitalize opportunities regarding technological inventions developed by researchers within the universities.

The main issue is to whom the intellectual property rights will belong when scientific discoveries are financed with public funds. The patenting of technologies, as well as the licensing of their use, has to be attractive for all parties, i.e., for both university researchers and the university itself. In many countries, patenting and licensing university inventions is very complicated and bureaucratic, some countries have tried to simplify the regulatory framework. In the United States, for example, the Bayh-Dole Act of 1989 was intended to make commercialization easier by clearing the way for universities to claim legal rights to inventions and innovations developed by their researchers using public funding.

In several countries universities can now participate in start-ups and spin-offs from their institutions. In China, universities are allowed to generate income through the commercialization of publicly funded research as well as venture investments. For example, spin-offs from Tsinghua University and Peking University in Beijing provide the universities with large annual returns on invested capital (Wu, 2007, Chen and Kenney, 2007). In many countries publicly funded initiatives have been targeted at processes of commercializing the intellectual property of universities by establishing specialized offices such as the Technology Licensing Offices in the United States or the Offices of Science and Innovation in the UK and Ireland.

An efficient and effective patenting and licensing system is essential for the commercialization of scientific research. In this context, Stanford University can be seen as a role model for the licensing and patenting of faculty inventions.

It has been estimated that Stanford University, the leading research university in the United States, generates licensing income of eight cents for every dollar spent on research, which for the financial year 2002-2003 amounted to an income of approximately US$ 43 million (Weiler, 2004). Other American universities like MIT and the California State University system are earning large amounts of license income per year.

Legal regulations and effective systems supporting patenting and licensing alone are, insufficient for generating new enterprises with high growth potential from universities. Other factors such as an entrepreneurial culture within the university and its surroundings play an important role. For example Stanford University, with research expenditure amounting to US$ 391 million, supported by the government, produced 25 licensed start-ups in 1997, whereas Duke University with sponsored research expenditure of US$ 361 million generated none (DiGregoria, Shane, 2003).

Around the globe, more and more governments initiate programmes to stimulate the commercialization of university innovations. An example in the UK is the case of three East Midland universities (the University of Nottingham, Loughborough University, and the University of Leicester), which received funding under a specific programme (Higher Education Reach-Out to Business and the Community - HEROBC). With a total of £750,000 the universities established the Innovation Fellowship Fund. Over the funding period 2000-2004, more than 50 fellows were employed to raise awareness and facilitate university commercialization. As one measurable outcome, the initiative supported 9 spin-offs and 15 license opportunities. The networking aspect was also significant because many partners were involved in the initiative, including seed capital and industry funds, and many businesses from inside and outside the region.

Networks

In the field of entrepreneurship, there are a large number of worldwide network formations and initiatives, which can be examined from different points of view. Independent of what the entrepreneurial activity concerns, networking is

the main vehicle for venture initiation, development and success (Johannisson, Nilsson, 1989). Interesting aspects of this study are networks, in which universities have made a special contribution to the generation of new ventures, particularly to those with a high growth potential. Typical benefits of continuous relationships of spin-off ventures with their university are assistance in the protection of intellectual property rights, reputation signalling by the university and a brokerage role of the university to external stakeholders, in particular potential investors and technology partners (Rothaermel, Thursby 2005).

Networks are intended to promote knowledge and technology transfer and can generate business opportunities in the first place. A specific form of networks, which is of particular interest for new high-growth enterprises, is the formation of clusters. In a modern knowledge economy, growth will depend to a large extent on existing or emerging networks. They provide a favourable environment, which encourages innovations based on the entrepreneurial culture of the region and the skills, attitudes and motivation of its work force (Almeida Mariza 2008).

An essential component in the networks of universities and new high-growth ventures are investors, especially business angels and venture capital investors. The access to venture capital is of major importance for new high-growth enterprises, especially in high technology sectors. However, the availability of venture capital is generally a decisive factor for all high-growth enterprises. The amount available, as well as the time factor, can be seen as critical success factors. Research also shows that the search for venture capital can be a time-consuming process. An interesting German study of more than 300 young ventures (less than 10 years old) showed that the enterprises needed on average 39 weeks to find a venture capital investor (Achleitner et al., 2007).

Research shows that geographic proximity can have a positive influence on the networks of universities, enterprises and venture capital investors (Di Gregorio and Shane 2003; Sorensen and Stuart 2001). The vast majority of venture capital in the United States is to be found in a small number of locations such as the Silicon Valley and Route 128. In Great Britain, Cambridge is the home of the largest concentration of venture capital funding outside London (Cambridge Technopole Report, St. John's Innovation Centre 2008). Networks of contacts and access to operational assistance are essential for new high-growth ventures. For example, business angels and venture capital investors, as well as professors at universities, are able to link new high-growth enterprises with potential network partners as customers and suppliers. They can provide operational assistance, which may help to operate the new venture in a better and more successful way.

In countries with a large geographical area, networks can reduce transaction or transportation costs. However, even in small countries a geographical concentration may be an advantage. An empirical study concerning the role of location and regional networks for biotechnological firms in Israel has shown that the biotechnology industry is concentrated around leading universities and research institutions in this field. The findings of this study revealed a strong tendency of biotechnology entrepreneurs to establish themselves in close proximity to research institutes, which were in many cases their former workplace. Even in those cases in which the biotechnology enterprises have extended their activities to an international level, the regional scientific network has maintained its importance according to this empirical investigation (Kaufmann et al., 2003).

In summary, access to relevant network partners as well as to sources of knowledge, innovation and physical resources such as university laboratories, is one of the most important value-added components that a university can offer to a new venture, in particular to high-growth technology start-ups. In terms of building entrepreneurial competences and motivation of university members in the first place, nascent entrepreneurial universities can build on existing entrepreneurship education practices, which, however, have often been implemented merely in an isolated manner.

2.3 Existing Practices

Contents and Methods of Entrepreneurship Education
With regard to content and method, the relevant questions of entrepreneurship education are: what should be taught and how should it be taught? The structuring of entrepreneurship education varies from country to country, and also between universities depending on their respective missions and goals. Generally speaking, modified teaching contents and methods are required in comparison to a classical understanding of university education, in order to develop and encourage the necessary competences for entrepreneurial thinking and acting. From a pedagogical point of view more attention is being paid to develop students' capacity to connect thought to action and theory to practice.

Courtesy of Intel

In the European context, the Bologna Process tries to harmonize European higher education in general and the design of consecutive bachelor and master degree courses in particular. A specific aim of this design is to make first bachelor degrees appropriate for entry into the labour market, and therefore the content of entrepreneurial training, even at undergraduate level, should be sufficient to enable students to embark on their own venture creation initiative at the conclusion of the training (European Commission, 2008). In addition to students enrolled in bachelor and master degree courses, leading universities (for example, Stanford University or the Technical University of Munich) have also begun to offer advanced training courses for business professionals to build their entrepreneurial competences to identify and exploit venture opportunities within their corporate workspace.

New venture creation is different from managing a corporate business and therefore different contents and methods are essential. It is important to promote entrepreneurial behaviour, attitudes and skills of students. Typically, skill-building courses in entrepreneurship education are creativity, new venture creation, business idea development and opportunity recognition, business planning, leadership, entrepreneurial marketing, entrepreneurial finance and growth management as well as soft skills such as negotiation (Solomon et al., 2002). In addition, however, the following will be a key element of university-level entrepreneurship education in the context of knowledge-intensive, innovation-oriented enterprises.

Delivering innovations in the form of new products or services and building rapidly growing enterprises requires specific leadership competences and social responsibility. In particular, entrepreneurial innovations always require the acceptance of society in general and direct stakeholders in particular who provide human capital and financial resources or who buy the enterprise's novel products. A good example is the biotech and gene technology sector where both novel products and production procedures need legitimacy (Bender, Westgren, 2001; generally see Loansbury, Glynn, 2001 and Aldrich, Baker, 2001).

Entrepreneurship education should build capabilities of leadership and social responsibility in students and academics. This is mandatory precisely because societal demands based on established social and ethical norms will influence the acceptability and economic viability of innovations and novel entrepreneurial opportunities based on them (Granovetter, 2000). Aldrich and Baker (2001) particularly stress that the dynamic environment of the innovation-driven new industries requires entrepreneurial learning and leadership for understanding and actively shaping what kind of entrepreneurial business concepts will gain societal legitimacy.

When introducing entrepreneurship into universities and colleges, one major challenge is to develop contents and methods that encourage entrepreneurial learning. Entrepreneurial learning is characterized by cooperative learning (creating teams); taking entrepreneurs as models (exchange, feedback, networks); doing and experience (trial and error); developing entrepreneurial ideas; working out problem solutions, and recognizing that mistakes can be learning opportunities (Klandt, Volkmann, 2006). A further challenge when supporting entrepreneurial learning is to encourage people to act entrepreneurially and to seize an opportunity for the creation of a new venture.

Entrepreneurial learning develops problem-solving competences through self-learning processes. It also develops opportunity recognition and acting competences through a change in perception, action and interaction. In the entrepreneurial learning process, the students are confronted with concrete problem situations, e.g., in case studies. The solutions must be worked out either independently or in a team. Often only heuristics are available for the generation of a solution. This also means that in most cases not one solution, but several solutions are possible for a specific problem. Moreover, solutions are often linked to a specific time and situation and cannot always be applied to another problem in the same way.

Action-oriented learning or activating teaching methods form the centre of a well-founded entrepreneurial education at universities and colleges. The capability to act on one's own authority and make decisions should thus be

strengthened. The relevant literature lists the following procedures and methods for stimulating such a learning behaviour:

- Practical case studies, especially of high growth enterprises (written, live and video cases)
- Group and team techniques for creating new business ideas and managing growth
- Business games and simulations (for business formation, early development and growth of the enterprise)
- Lectures from entrepreneurs and other practitioners (possibly in connection with visits to high-growth enterprises)
- Interviews with entrepreneurs, especially high-growth entrepreneurs
- Project work
- Development and assessment of business plans
- Foundation of student enterprises (development of new venture creation and growth projects)

Such methods give students the chance to experience a wide range of entrepreneurship issues and experiment with their own entrepreneurial ideas in a "dry run" or real small business scenario. However, within this low risk environment traditional educational methods, such as lecturing, do not correlate well with the development of entrepreneurial thinking and acting. There is a need for more interactive, interdisciplinary and proactive learning approaches, in which the teacher becomes more of a moderator than a lecturer.

Where suitable for fostering team-based, participant-centred and interactive learning this may be supported by IT infrastructure, for example, for individually tailored e-learning modules, business simulations or virtual project communities with participants from different countries or disciplinary backgrounds. Inter-disciplinary collaboration is an essential element in developing enterprising abilities. The importance of interdisciplinary work in creating entrepreneurial opportunities has been widely recognized. As regards the specific content, programmes and courses should be adapted to the different target groups (e.g., undergraduates, graduates, post-graduates).

All in all, the question of the right contents and methods in entrepreneurship education is answered with great variability in theory and in practice. There are no universally applicable contents and methods to teaching entrepreneurship, including high-growth entrepreneurship. It is important to define the curriculum objectives and desirable outcome. Students should have options at their disposal from which they can choose, and the courses should be designed in a flexible way. Furthermore, extra-curricula activities, business plan competitions and other events are frequently offered providing the added advantage of bringing the local business community into the educational environment.

Approaches to Teaching Entrepreneurship

For the fostering and development of entrepreneurial competences in students at universities and colleges, good teachers and well-founded teaching and learning targets, contents and methods are essential. For a target-oriented application of entrepreneurship training at universities and colleges, an institutional anchoring on the basis of a suitable model is necessary. There also raises the question of where the teaching is to be carried out. One challenge in this context is to make entre-preneurship education accessible to all students.

In this context, a study by the Cornell University, US, is of interest (Streeter et al., 2002). For this study, 38 entrepreneurship programmes used at US universities and represented in a ranking were systematically compared and investigated. This comparison is based on distinguishing between two types of programmes. Depending on the level of spread of each programme at the university or college in question, a distinction was made between focused programmes and university-wide programmes. This distinction can sometimes also be taken as an indicator for the extent to which the university/ college or its governing body identifies itself with the subject of entrepreneurship or entrepreneurship education.

According to this study, approximately 74 % of all universities and colleges offer their individual entrepreneurship programmes to the whole university. This university-wide reach is important in so far as entrepreneurship can create job opportunities and address societal challenges and thus it should be accessible to every student. The principal alternative ways to structure entrepreneurship programmes are depicted in the figure below.
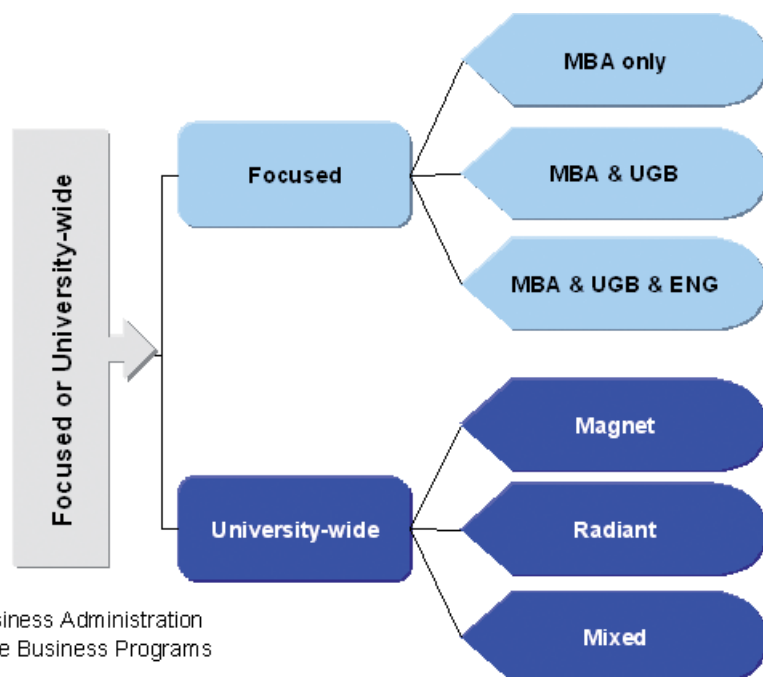
MBA: Master of Business Administration
UGB: Undergraduate Business Programs

Possible Organizational Structures of Entrepreneurship Programmes (adapted from Streeter et al. 2002)

According to Streeter et al. (2002), the university-wide programmes can be classified into two categories, the magnet programme and the radiant programme. In the magnet programme, the entrepreneurship centre constitutes the focus. The entrepreneurship activities are offered by a single academic unit. It is nevertheless possible that all students of the university participate. Resources and capabilities are bundled within the framework of this platform. In this way, coordination and planning of the entrepreneurship activities are supported. This approach is used at the Massachusetts Institute of Technology (MIT), at its Sloan School of Management. Over 1,600 students participate in entrepreneurship courses every year. Special emphasis is placed on the students of technical faculties to generate synergies between economic and technical approaches. Internal polling at MIT has shown that this interdisciplinary approach is successful, as 80 % of the enterprises founded exclusively by engineers went into insolvency, whilst 80 % of the enterprises originating from MIT have survived in the market. The aim of the entrepreneurship centre is to establish an interdisciplinary network, which will link together students, graduates, entrepreneurs and university members of MIT. An education with practical relevance, including hands-on training and introductions through contacts within a network, is another aim of the entrepreneurship centre.

In contrast, entrepreneurship courses for radiant programmes are offered outside the Business School. In the radiant model, individual faculties or departments are responsible for the integration and visibility of the entrepreneurship activities. Consequently, the entrepreneurship programmes must be adapted to the specific structures of the individual faculties. At Cornell University, for example, the entrepreneurship education is provided by nine schools and colleges. Based on the radiant model, Entrepreneurship courses are available to all students. The entrepreneurship programmes are coordinated by the Entrepreneurship and Personal Enterprise (EPE) Governing Board and orientated towards the existing requirements of the regular study courses. The members of this board are all deans of the relevant

participating faculties. In addition, there is an advisory committee consisting of 80 entrepreneurs and managers who take on advisory functions and secure financial support. (Streeter et al., 2002; National Agency for Enterprise and Construction, 2004).

This study shows that in the US approximately 74 % of the universities and colleges offer entrepreneurship programmes to the whole of the university, the majority of which are magnet programmes. There are, however, also universities that use mixed models.

Data from certain European countries show that the majority of entrepreneurship courses are offered in business and economics (for instance in Spain, Germany and the UK). This focusing approach seems, however, to be inadequate, as entrepreneurial ideas often originate in the departments of science, engineering or technology. It is therefore a special challenge for universities and colleges to develop and introduce entrepreneurship courses with interdisciplinary orientation. These interdisciplinary approaches will create the opportunity for a strong collaborative linkage between the different university units. In this way, entrepreneurship programmes can create a university-wide entrepreneurial community and network and establish strong links between business experts on the one hand and science, engineering and technology experts on the other. Such cross-discipline collaborations are often productive by facilitating joint technological developments, innovations and commercialization. Entrepreneurial cross-discipline collaborations can ultimately lead to new high-growth ventures or spin-offs from universities and colleges.

A supplementary ingredient to foster cross-disciplinary entrepreneurial activity is the joint development of business ideas and business plans for promising venture opportunities by faculty members with different backgrounds. Developing entrepreneurial business plans in faculty teams may be encouraged through sponsored business plan competitions. There are numerous university-level contests in the area of technology entrepreneurship, often sponsored by established high-tech companies like Cisco and Microsoft. Moreover, there are also events at national and international level. An

example of a high profile business plan contest that combines technology and non-profit social entrepreneurship is the Global Social Venture Competition (GSVC) sponsored by the Goldman Sachs Foundation and others. Generally, within these competitions company sponsors serve both as financial and in-kind sponsors offering their expertise and technology. Moreover, it is important for business plan competitions to have educational components and feedback elements for students. Beyond training students and other faculty members in developing novel venture opportunities, writing business plans also serves opportunity exploitation by facilitating resource acquisition (e.g. from investors). Generally, writing business plans appears to enhance survival chances of emerging venture projects (Delmar, Shane, 2004), thus helping to facilitate the commercialization of new ideas and technologies.

Against the background of growing globalization, international training of the target groups is important, as entrepreneurship programmes can make a considerable contribution to intercultural understanding. Global initiatives for promoting entrepreneurship include the SIFE organization (Students in Free Enterprise), supported by the Goldman Sachs Foundation, is a worldwide effort to foster entrepreneurial activity at more than 1,500 universities in over 40 countries (see good practice case on SIFE further below).

2.4 Key Indicators of Success

Evaluating Quality, Effectiveness and Impact of Entrepreneurship in Higher Education

For entrepreneurship education to be successful, continuous improvement in education quality and effectiveness is necessary. Effective ways must be found to improve the assessment of the impact of entrepreneurship education on society and the economy. The basis for quality assessment frameworks and guidelines for universities is generally formed by standards agreed on by countries that have signed the various declarations under the Bologna Process. (The Bologna Process aims to create the European higher education area by making academic degree standards and quality assurance standards more comparable and compatible throughout Europe.)

In Europe, for example, the European Association for Quality Assurance in Higher Education (ENQA) standards and guidelines are important for an evaluation in higher education[14]. Due to the special characteristic features and goals of entrepreneurship education, the assessment criteria for entrepreneurship programmes, courses and activities may, however, vary from general standards and guidelines. Accreditation systems for economics and business programmes are often used to evaluate entrepreneurship programmes and courses, although the latter often have different objectives, approaches and results. Evaluation must be adapted to the objectives and entrepreneurial competencies to be developed (European Commission, 2008). The evaluation focus can be on individual entrepreneurship courses and programmes (quality and effectiveness) but also more broadly on the business link activities of universities and impact on society and economy.

Courtesy of Cisco

For the evaluation of entrepreneurship in higher education, both quantitative (measurable) as well as qualitative (difficult to measure) indicators are important. Quantitative criteria include the number of students who want to take the course, student enrolments and the increase in the number of participants. Such quantitative criteria are, however, only to a limited extent meaningful to assessing the quality of an entrepreneurship education.

Rather, student evaluation of entrepreneurship courses and activities should be paramount, although this has only a shorter tradition in many countries. In the 1990s, for example, professors often introduced entrepreneurship education without having any training themselves in the subject or being able to rely on proven concepts. In this respect, trainer programmes for the improvement of entrepreneurship education quality are useful and have been carried out for several years in the United States (for example, European Entrepreneurship Colloquium for Participant-Centred Learning (EECPCL), held at Harvard Business School; and Price Babson Symposium for Entrepreneurship Educators (SEE), a cross-disciplinary educators´ programme at Babson College).

Other important evaluation factors are the progress in entrepreneurial attitudes, perceptions and intentions of students taking entrepreneurship modules and changes in the image of and attitudes towards entrepreneurs. Due to their socialist pasts with shorter entrepreneurial traditions and lower levels of entrepreneurial culture, many Eastern European countries, still have negative attitudes toward entrepreneurial behaviour and activities.

Another criterion is the level and quality of employment for students, who have taken entrepreneurship modules, for example, five years after completion of their studies (European Commission, 2008). Future measurements are important because there is often a substantial time lag between entrepreneurship education and its impact (Storey, 2003).

In contrast to the quality of entrepreneurship programmes and courses, the performance of university-business links or technology transfers is comparatively easy to measure using quantifiable indicators (Nelson, Byers 2005). National governments in many countries such as China are attempting to increase university-business links by measuring the performance of entrepreneurial activities of universities with the number of spin-offs or start-ups out of the university or university incubators, in addition to other indicators (Wu, 2007).

Additional indicators for measuring the performance of university-business links include commercialized inventions, the number of new patents or licenses, revenues and the number of workplaces created by the new start-ups. The two latter indicators are of special importance. As a complement to the quantitative indicators, qualitative criteria such as the quality of the start-ups and new workplaces can be useful when evaluating the outcome and implication of entrepreneurial activities of universities and colleges. For example, the following measures are taken by the Chinese government and universities to promote entrepreneurship education (SAPECG 2006):

- Foundations established or funds marked to support students to start up their own businesses.
- Favourable policies such as tax reduction or tax exemption granted to start-up businesses created by students.
- Incubation bases or science and technology parks established for students
- Entrepreneurship training courses offered.
- Extra-curricular activities such as entrepreneurship saloons, business plan competitions, etc.

Principal levels of impact measures of higher education entrepreneurship activities discussed above are summarized in the figure below:
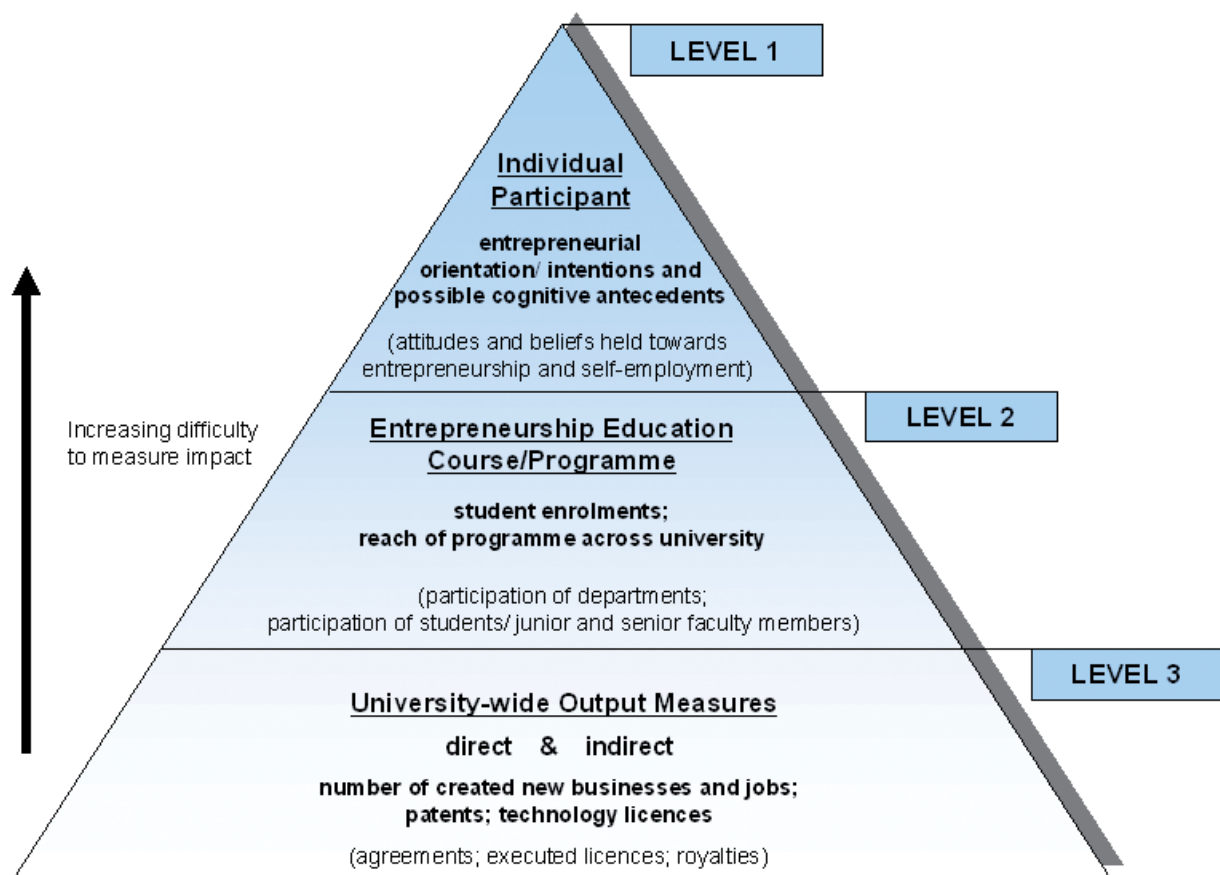
2.5 Case Studies

Some Examples of Good Practice

The following examples of good practice relate not so much to delivering entrepreneurship education in general, but rather to the challenge of nurturing technology-based, high-growth entrepreneurship up to the emergence of entrepreneurial gazelles. Therefore, the focus is to be on comprehensive entrepreneurship programmes. In the US and UK, there are many high-quality programmes. In the US, for example, Babson College, Harvard University, University of Pennsylvania, and University of Texas at Austin, all have particular areas of excellence such as integration of alumni and entrepreneurs in teaching, funding support of new ventures, or collaboration with regional industry. However, an essential prerequisite for "breeding" high-growth entrepreneurship appears to be the full-scale integration of all elements to encourage the discovery of high technology venture opportunities and their commercial exploitation in university contexts. Towards this end, the University of Cambridge, UK and Stanford University, US have been selected as examples of established practice, which integrate almost all aspects of the entrepreneurial university's value chain, ranging from a teaching curriculum for innovative entrepreneurship (in particular in the sciences and engineering) to the formation and support of new businesses in the context of extensive commercialization networks.

In addition, we will highlight examples of "change practice" – the process of transforming higher-education institutions to build an integrated foundation for high-technology and growth entrepreneurship. The selection of these examples is geared towards the key issues discussed in this chapter: a) becoming an entrepreneurial university internally as an organization; and b) liaising with industry and regional businesses externally to facilitate the commercialization process in the market place via networks and university-industry links (that is, endogenous and exogenous elements of entrepreneurial activity at universities (Etzkowitz, 2003). These examples, though drawn from different economic and cultural contexts, highlight how formerly non-entrepreneurial institutions have developed entrepreneurial elements of knowledge capitalization in their teaching and research output. The examples of change practice are located in Continental and Eastern Europe, Asia, Australia, South America and South Africa.

Examples of Established Practice

University of Cambridge, UK

As is typical for established entrepreneurship programmes, science-based high technology and entrepreneurship have a long tradition at the University of Cambridge and its surrounding region. The "Cambridge Technopole" is a geographic area of intense high-technology innovation activity and one of the fastest growing regions in the UK. "250 active companies can trace their origins to knowledge transfer from the University. In 2005, these 250 companies employed 3,990 people and generated £574 million in revenue" (Library House, 2006). At the university and in the surrounding area an elaborated entrepreneurial infrastructure has been developed (see figure below), which is devoted to turning out entrepreneurial action by students, scientists and alumni.
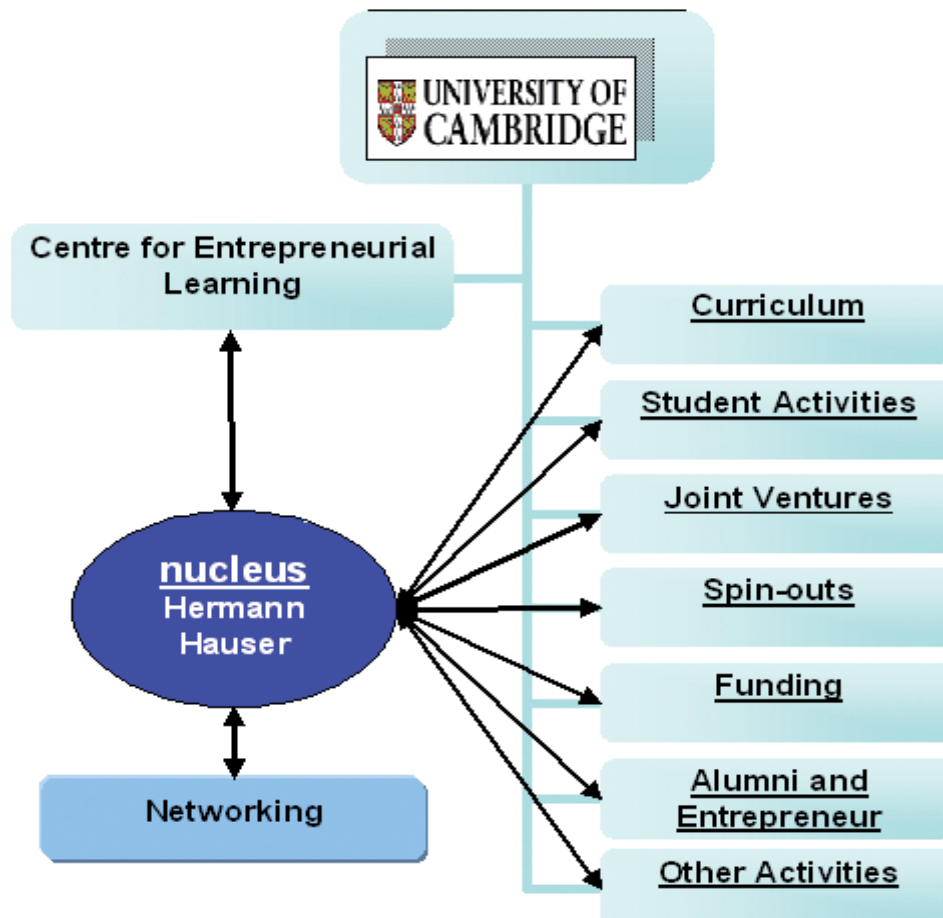
University of Cambridge, UK – Entrepreneurial Infrastructure for High-growth Entrepreneurship (based on EFER 2007)

The university offers entrepreneurship courses at undergraduate and postgraduate levels across a wide range of science and engineering degree programmes. The curriculum comprises more than 40 courses taught by both faculty and real entrepreneurs, who encourage solving of real-life business problems and action-based learning; the latter is supplemented by student activities (for example, clubs and business competitions) and interdisciplinary university projects. The university's entrepreneurship offerings across the different schools are coordinated by its Centre for Entrepreneurial Learning (CfEL). Beyond this, the University of Cambridge also addresses individual entrepreneurs and corporate innovators in a summer school where business opportunities are created and exploited, backed by management consulting and contacts to venture capital investors.

Further down the support chain, Cambridge Enterprise initiates and facilitates technology commercialization and knowledge capitalization, offering a portfolio of services including licensing of intellectual property, consulting on enterprise formation, fund-raising support, and so on. Cambridge Enterprise is currently responsible for licensing about 20 technologies to companies world-wide, supporting 33 spin-outs in the biomedical sector and 18 in electronics, IT and telecommunications.

The current level of entrepreneurial output has evolved from a long-term development process of the Cambridge Technopole. Cambridge's success is based on the strength of university research, the availability of finance in the early days (from Barclays Bank) and the relaxed approach that the university took to intellectual property transfer. At the same time, the nucleus of all entrepreneurial spirit at Cambridge can be traced back to individuals and their networks rather than to the later produced conditions (Vyakarnam, 2003).

Foremost, Hermann Hauser, an Austrian physicist and high-tech entrepreneur who initially came to Cambridge to learn English, evolved into the key individual for entrepreneurship. An habitual entrepreneur, Hauser worked as a catalyst in spreading the spirit through an evolving

extensive social and professional network. Cambridge's serial entrepreneurs within the network acted as multipliers, generating start-ups and spin-offs across the faculties and finally at the whole university.

Stanford University, US

Stanford University, located in Northern California and nucleus of the Silicon Valley, has a well-known track record in the genesis of modern high-technology entrepreneurship. The university generates substantial royalty income from technology licensing (approximately US$ 45 million in 2003 (Nelson, Byers 2005)). Consistently more than 50 % of Silicon Valley's revenue is generated by start-ups from Stanford (Gibbons, 2000). Similar to Cambridge, Stanford offers a wide range of curricular and extra-curricular activities focussing on entrepreneurship, technology transfer and knowledge sharing with established "high-tech" companies. Stanford's curricula directed at high-growth entrepreneurship are delivered by numerous institutions in different departments, including the Stanford Technology Ventures Program (STVP) in the School of Engineering and the Centre for Entrepreneurship Studies (CES) in the Graduate School of Business. The curriculum encompasses more than fifty courses offered on a regular basis.

Teaching methods are developed and advanced through institutional platforms like Stanford's Entrepreneurship Corner and Roundtable on Entrepreneurship Education (REE). The Entrepreneurship Corner (see http://ecorner.stanford.edu) offers videos and podcasts on a wide range of technology and entrepreneurship topics delivered by high profile entrepreneurs such as Mark Zuckerberg of Facebook and Larry Page from Google. REE hosts worldwide conferences where higher-education professionals meet to share and develop novel practices on entrepreneurship education with an emphasis on university-wide efforts and high-growth enterprises (see http://ree.stanford.edu).

The curriculum is underpinned by numerous student groups and activities related to technology transfer and entrepreneurship. Many of these activities are hosted by the School of Engineering. For example, the Business Association of Stanford Entrepreneurial Students (BASES)

facilitates networking and knowledge sharing between students from all disciplines (a description of this and other student groups as well as university institutions is presented in Nelson, Byers 2005). Many of the different groups and activities are together under the common roof of the Stanford Entrepreneurship Network (SEN) that functions as a single point of contact for those involved in entrepreneurship and technology transfer. Notably, underneath this umbrella, the different groups and institutions work autonomously and, at the same time, maintain considerable cross-group awareness and networking relationships (Nelson, Byers 2005).

This networking culture also stretches to links with external high-technology companies in the Stanford region. Examples are the Centre for Integrated Systems and the Biodesign Network. The former is a cooperation centre between the university and industrial firms related to integrated systems (Weiler 2003). The latter is a network providing education and support to students and faculty members aiming to develop and commercialize health care products. The network offers access to professional biomedical communities, manufacturers of medical technology and investors, all of which are common in the San Francisco Bay area.

Both the intra-university relationships and the many university-industry links entertained by the university provide the platform for Stanford's integrated architecture of entrepreneurship education and technology commercialization. As to the underlying catalysts of this architecture Weiler (2003) proposes that geographical proximity of Stanford and the Silicon Valley is only one element. The essential ingredient may be the affinity between the university's academic culture and the corporate culture of high-technology companies (see Weiler 2003, p. 287 for a list of potentially corresponding cultural elements that generate reciprocity in cooperation projects and mobility between people's often simultaneous, scientific and corporate roles). In essence, the close local and face-to-face interaction and knowledge sharing (Brown, Duguid 2000) helps knowledge-based technology entrepreneurship in general and Stanford's

output of spin-outs and their funding in particular. To propel such links, several professional networking and alumni platforms exist at Stanford that offer information, funding and contacts vital for venture projects and sponsor institutions like the Stanford Technology Ventures Program hosted by the Engineering School.

In summation, both examples of established practice show: a) that a differentiated and completely institutionalized infrastructure for the specific support of technology-based, high-growth entrepreneurship has been developed at these universities; and b) that this infrastructure is bolstered by the continuous commitment of different groups, including students, university staff (in research, teaching and administration), alumni, established entrepreneurs and corporate professionals in the area of high technology.

The following examples of good practice in terms of initiating change show that other institutions have set out to develop and operate similar components of entrepreneurship programmes to support high-growth entrepreneurship in the specific cultural and political context of higher education in their respective countries.

Examples of Change Practice
The following are examples of higher education institutions that have initiated entrepreneurial change in their organizations. The examples concentrate on a) developing the entrepreneurial university as a whole and b) completing the support chain for new venture projects in general and high-growth entrepreneurship. The completion process may be supported by establishing national and international networks on entrepreneurship education to share teaching concepts and expertise not available at individual universities.

This seems important especially for countries with higher education sectors where entrepreneurship education is still in the fledgling stages; here, networks for exchanging teaching methods and know-how help to develop high-quality concepts and assist individual universities in delivering entrepreneurship courses and activities to their students.

Transforming Education and Research Institutions into Entrepreneurial Universities

National University of Singapore (NUS), Singapore (Wong, 2007)

Overall context:

- NUS is Singapore's largest public university and a key element within the overall education and innovation strategy of the city-state
- Movement towards knowledge-based strategy for economic growth in Singapore (Wong et al. 2005)
- At NUS, concentration on technology commercialization and building intellectual property capital

Changes within university organization:

- Beginning in late 1990s, a policy shift from traditional education/research institution towards becoming a more entrepreneurial university
- Initiative of new university president, appointed in 2000, who authored a new vision statement for the university: "NUS – Toward a Global Knowledge Enterprise"
- Institutionalization of new division, NUS Enterprise, "intended to inject a more entrepreneurial dimension in the university's education and research and to generate more economic value from the university's resources" (Wong 2007, p. 202)
- Intensification of university-industry collaboration and support of academic entrepreneurship under the aegis of NUS Enterprise (e.g., provision of incubator facilities, seed funding)
- Institutionalization of an Entrepreneurship Centre: introduction of entrepreneurship in the university's education programmes, in particular relating to students and graduates in technical fields; establishment of a network of entrepreneurs and investors to support the spin-outs of NUS (consulting; funding)
- A considerable impact on the university's entrepreneurial output over the last 10 years, e.g. in terms of granted patents, licences and spin-off activity (Wong, 2007)

Technical University of Munich (TUM), Germany (EU Commission 2008)

Overall context:

- TUM is a high-profile research and teaching university with particular strengths in science and engineering, which has embraced its vision – TUM The Entrepreneurial University.
- This vision became a trend-setting element of TUM's positioning in various policy initiatives by the German government directed at university institutions (e.g. the "Exzellenzinitiative" by the German Federal Ministry of Education and Research targeted to propel cutting edge research in leading German research universities).
- An important nucleus of TUM's entrepreneurial activities is the KfW-Chair in Entrepreneurial Finance endowed by the KfW-Bankengruppe, a German public law banking institution that supports new business formation and innovation projects.
- Unternehmer TUM (entrepreneurship means "unternehmertum" in German), the second core element of TUM's university-wide entrepreneurial initiative, played a role in the university's profile in the "elite university competition" set up by the German government.

Changes within university organization:

- Hosted by the KfW-Chair, over the last decade the university has developed a differentiated portfolio of teaching and support courses for students interested in entrepreneurship including seminars on venture capital, biotech venturing and social entrepreneurship; and active-learning modules such as case study projects where students become consultants working on real-life entrepreneurial projects with business professionals and entrepreneurs.
- Under the organization-wide roof of Unternehmer TUM, the university offers numerous entrepreneurial and intrapreneurial activities open to all departments, including business planning courses; participation in the Munich Business Plan Competition "manage & more programme", a scholarship project for undergraduates and postgraduates building business and entrepreneurial skills to excel in future corporate intrapreneurial

management roles; and an executive programme ("innovation & business creation") for business professionals to develop venture opportunities in corporate contexts funding and on-campus incubator facilities at "gate" (Garchinger Technologie- und Gruenderzentrum).

Overall context:

- PUC-Rio is a private, non-profit catholic university that "undertakes innovation and entrepreneurial activities as part of its mission and as a matter of an institutional policy" (Almeida 2008, p. 48).
- Development path from a basic education and research university to institutionalized entrepreneurial activities as a result of reductions in federal funding; PUC-Rio started to tap alternative sources of financing to become more independent from state funding (e.g. establishment of technology transfer and licensing office to initiate commercial links with industry).

Changes within university organization:

- PUC-Rio's Enterprise Formation Programme pioneered first entrepreneurship courses in 1997 (based on projects by the National Research Council targeted at the implementation of entrepreneurship courses at Brazilian universities (e.g. the Softstart Project)); institutionalization of small incubator.
- Main driver of movement towards entrepreneurial university: "internal consensus, particularly among its Directors, that established entrepreneurship and development as an integral component of the University's mission" (Almeida, 2008, p. 49).
- University-wide commitment reflected and facilitated in PUC-Rio's Genesis Institute for Innovation and Entrepreneur Action established in 2000.

- The Entrepreneurship Education initiative at UCT started in 2001 with the founding of the CIE; the centre is responsible for the South African Global Entrepreneurship Monitor effort.
- CIE serves three interrelated tasks: research into entrepreneurship and small business, development of course material and new business creation/development.
- The entrepreneurship efforts at UCT particularly developed around the task of educating both graduate students and school leavers offering local and nation-wide course programmes.
- Similar to other countries, the entrepreneurial initiative of this university envisioned not only to spur economic growth but also to address social concerns, including poverty and crime reduction.

From these examples, we see that Cambridge and Stanford host in-depth arrays of formal and informal support and facilitation mechanisms for entrepreneurship, which have evolved over decades. At the same time, Nelson and Byers (2005) expect that there will not be a successful uniform design of support networks for entrepreneurship, most likely because of differences in the cultural and political context among institutions of higher education world wide. Indeed, the discussion above of the change cases at universities in different countries shows that pressures and incentives stemming from environmental contexts play a role in the early-stage evolution of entrepreneurial activities at institutions of higher education.

These conditions and resources to develop entrepreneurship programmes in higher education will be very different across developed market economies, transition economies and emerging countries. Because of this, specific education and support programmes for entrepreneurship will be needed to address local challenges such as raising the general education level and combating crime and poverty through the creation of entrepreneurial opportunities.

In addition to external factors, internal support and commitment by the institutions' top-management and departmental leaders may have been significant in creating the vision to make entrepreneurship a part of the university's overall profile. This seems to be the case at NUS and TUM. Over time, such support encourages the development of a complete support chain for (high-growth) entrepreneurship from originally isolated initiatives (Almeida, 2008, p.56).

Following are some good practice examples. They show how a clear strategic focus on entrepreneurship – linking research, teaching and practical activities – enables a specialized infrastructure for entrepreneurship to develop over time.

Completion of Support Chain for Entrepreneurship at Universities
Jönköping University, Sweden

- Jönköping University is a foundation delivering higher education through its four schools, including Jönköping International Business School (JIBS), founded in 1994.
- The university in general and JIBS in particular have built a reputation for entrepreneurship research and teaching; this is supplemented by high-impact activities in entrepreneurial management and enterprise policy in cooperation with business professionals and policy-makers to foster the international business creation capacity of Swedish small- and medium-sized enterprises (SMEs).
- The dedication to entrepreneurship has led to an integrated portfolio of research and education themes around entrepreneurship, innovation, and SMEs.
- A good example of the integration of entrepreneurship into other schools, and the horizontal and vertical benefits derived from this, is the university's School of Health Sciences where entrepreneurial thinking underpins the development of novel health services and innovation-driven change in the health sector. The university also has worked to complete its specialized support infrastructure for entrepreneurship through its large entrepreneurship library and the university's commitment to the Science Park Jönköping, which provides support to the start-up and growth of new ventures, including those founded by university faculty.

Australian Graduate School of Entrepreneurship (AGSE) at Swinburne University of Technology, Australia

- At Swinburne University of Technology emphasis on entrepreneurship has evolved into a complete graduate school devoted to the themes of innovation and entrepreneurial management.
- Today, AGSE is a leading Australian graduate school dedicated to educating and building future entrepreneurial leaders.
- The school offers a blend of different postgraduate level entrepreneurship programmes and research at different local and offshore campuses. The school's focus on entrepreneurship is institutionally sustained as a part of the University's new Faculty of Business and Enterprise developed in 2005.
- AGSE and Swinburne University of Technology have a long track record of delivering entrepreneurship education since the 1980s.
- Different concepts have been tried and elaborated over time in terms of curriculum designs, course and degree infrastructures and the target group of students. (For a detailed case study on the origin and evolution of Swinburne University's entrepreneurship programmes see McMullan and Gillin, 1998).

Strossmayer University of Osijek, Croatia (EFER 2007)

- Located in an Eastern European transition economy, Strossmayer University some years ago started to allocate resources to developing entrepreneurship education.
- Entrepreneurship courses are provided through the Department of Economics. The heart of the university's efforts to institutionalize entrepreneurship on a sustainable basis is a UNESCO Chair in Entrepreneurship and the International Centre for Entrepreneurial Studies (ICES), which was established with high profile international support from leading Anglo-American entrepreneurship scholars.
- International and local staff of more than thirty lecturers teach core and elective entrepreneurship courses. Some of the courses are obligatory for business and economics undergraduates, aiming to mainstream entrepreneurship in all degree courses.

- Beyond the basic entrepreneurship-education infrastructure the university has improve specific advanced aspects such as developing an adequate case pool for active learning of entrepreneurship.
- Classroom-oriented entrepreneurship courses have been expanded through external cooperation with Centre for Entrepreneurship (residing outside the university), which supports students, alumni, and the community in new business formation. An external organization of alumni graduates is integrated in teaching and mentoring of entrepreneurship projects.

Bergische University of Wuppertal (BUW), Germany

- BUW has fostered entrepreneurship education since 1998 as part of the regional Bizeps new venture support network within the "EXIST – University-based start-ups" initiative of the German Federal Ministry of Education and Research. Entrepreneurship has been institutionalized through two endowed-chair professorships. The EXIST programme initiated by the German government aims at a) fostering university spin-offs and academic entrepreneurship by incorporating the entrepreneurship theme at German universities in a sustainable way; b) strengthening networks between universities and regional players involved in the support of new ventures (e.g., technology centres, consultants and banks); and c) building new venture support networks around EXIST universities (an opportunity which has been seized by numerous German universities).
- The university's most recent project, "Bizeps Gazelles", started in 2008, aims to develop and exploit venture opportunities for high-growth entrepreneurship in the university's science and engineering departments, whose researchers, graduates and students represent a target group of around 3,000 university members.
- A specific feature of the gazelles project is its focus on the discovery and development of entrepreneurial opportunities early on in the process. Without such project initiatives these opportunities based on technological inventions and research output often remain undiscovered at universities.

- Building a more complete support chain, potential gazelles are backed up through a sequence of a) initial Technology Scouting to generate business opportunities, b) an Entrepreneurial Business Lab to develop business plans as well as internationalization and technology management capabilities and c) Entrepreneurial Business Incubation facilities.
- In the area of technology scouting in renewable energies there is cooperation with the internationally recognized Wuppertal Institute for Climate, Environment and Energy and with a local technology centre from the Bizeps network for incubator support.

Leon Kozminski Academy of Entrepreneurship and Management, Poland (European Commission, 2008)

- The academy is part of the higher education system in Poland, which, as a transition economy, has little established infrastructure for entrepreneurship education at individual universities.
- The academy programme tries to fill this gap by establishing a nation-wide networking and infrastructure platform. The platform provides packages for introducing entrepreneurship modules at Polish higher education institutions for science and engineering. The packages consist of teaching manuals, textbooks, on-line lecturing material, a platform for lecturer exchange between universities (e.g., for team teaching courses) and a novel "train the trainer" component. Additional tools focus on innovative entrepreneurship (e.g. courses on international and technology entrepreneurship).
- The programme allows to rapidly disseminate course concepts for entrepreneurship education in non-business contexts in an emerging market economy with little entrepreneurial tradition in its institutions of higher education. Similar programmes also exist in established market economies which, however, have little tradition in teaching entrepreneurship in their universities; e.g. the IDEA network in Denmark – International Danish Entrepreneurship Academy – which concentrates not only on education and training but also on the promotion of growth of innovative new firms and venture projects (IDEA Network Annual Report 2007).

Unlike small business, the development and growth of high-technology ventures require access to substantial outside financing, technology partnership, sales contacts, management support, and so on. Hence, for this type of new businesses it will be mandatory for traditional teaching and research universities to extend their service offers beyond the classroom to provide coaching, funding sources and bridging contacts.

The universities discussed above, which started entrepreneurial activities within the last 30 years or less, show that a more complete support chain may be built incrementally. The example from Poland shows that in this development process it may be sensible to join forces with other education institutions, not only to share teaching concepts and material, but also to cooperate in industry-related projects around new technologies with potential for commercialization.

Networked cooperation among institutions of higher education and business corporations will be particularly valuable in expanding entrepreneurial thinking and business competence in developing and emerging economies. Strengthening overall entrepreneurial capability will be particularly important for emerging and developing

markets with their extraordinary economic growth potential over the next decades. The role of universities and colleges, especially those in industrialized countries, will be to share their knowledge about entrepreneurship, management and business. The examples of good practice showcased below indicate that this also helps to get students and academics from developed countries involved in entrepreneurial activity, contributing to foster entrepreneurship world-wide.

Global Initiatives for Promoting Entrepreneurship
Students in Free Enterprise (SIFE) (www.sife.org)

- SIFE was founded as a non-profit organization in the US in 1975. Today the SIFE network operates on a global scale in 47 countries involving approximately 38,000 students at more than 1,500 universities.
- SIFE is a global network of business executives, academic leaders and university students devoted to creating economic opportunities for others.
- As a student-centred initiative, SIFE aims to promote entrepreneurial skills in student teams who develop entrepreneurial business projects that serve economic needs within local communities around the world.
- SIFE student teams will equip others with essential business knowledge empowering them to build and sustain their own business projects.
- SIFE is supported by numerous executives from multinational companies acting as advisors to student teams and as judges in the annual national and global SIFE competitions in which students present their business projects.
- Being a truly global initiative, SIFE hosts a diverse range of student activities, including projects involving Chinese students and Tibetans developing ecotourism together and building a secondary school in Eritrea catering for children from low-income families.
- Improving the financial literacy of school children in Europe through a self-produced video clip marketed by SIFE.
- Supporting women from Ethiopia to build their own sewing company producing hygienic clothing and medical scrubs.

- Managed by the Thunderbird for Good initiative, Project Artemis strives to build the entrepreneurial skills of Afghan business women through a unique business-skills training programme, including a two week business and entrepreneurial decision-making training ; mentoring is done by successful women entrepreneurs who provide continuous business coaching and support.
- Project Artemis seeks to provide personal economic improvement and business independence for participating women and to benefit the greater Afghan community in terms of business education, a stronger business base, and national growth and prosperity.
- Business examples developed by Afghan businesswomen taking part in Project Artemis include the founding and development of a construction company, a business consultancy, a training services provider, a micro-lending organization, and a textile goods company.
- In 2008 Project Artemis joined Goldman Sachs' *10,000 Women* initiative.
- *10,000 Women* is a global initiative to increase the number of underserved women receiving a business and management education and to improve the quality and capacity of business and management education around the world.
- To tap the global resource of women as entrepreneurs and managers, *10,000 Women* supports partnerships with universities and development organizations that will lead to 10,000 women receiving a business and management education.

Cooperating with local development organizations in emerging countries enables a) the design of tailor-made business education for women from developing countries ; and b) the building of local education capacity in these countries, including business curricula, case studies and faculty training organized in "sister school partnerships."

2.6 Recommendations

Strategic and Political Implications of High-growth Entrepreneurship

The impact of entrepreneurship on the strategies of institutions of higher education is widely recognized and accepted. The demand for entrepreneurship programmes, courses and activities in higher education is increasing globally. Many academic leaders see entrepreneurship as the major academic discipline in the twenty-first century (Grant, 1998). In comparison with the United States and Western Europe, there are countries and regions with a shorter entrepreneurial tradition and a less developed entrepreneurship-oriented culture, such as China, India and Eastern Europe, where in many cases entrepreneurship has so far only played a minor role, if any, at universities and colleges.

A major issue for many low-income countries and regions (especially peripheral regions) is the drain of highly qualified graduates to high-income countries or more central regions. Teaching entrepreneurship in higher education institutions may help to raise the awareness among students and graduates that there are attractive entrepreneurial opportunities that offer incentive to stay in the country or region affected by the brain drain, or even to create jobs through enterprise formation. In addition to the fundamental importance of entrepreneurship education in general as a discipline at universities and colleges, a primary focus on entrepreneurship education for high growth is vital, as growth-oriented enterprises can have a major impact on economic dynamism (Wilson, 2008).

In many countries of North America, Asia, Oceania and Europe, a large number of universities and colleges have established entrepreneurship centres or departments, some of which offer comprehensive teaching and learning programmes for entrepreneurship. At the same time, the realization that entrepreneurship education can go beyond knowing how to write an effective business plan for funding is gaining momentum. An important aspect here is the expansion of the focus of entrepreneurship education in a wider sense (Koch, 2003). Such an approach would integrate those students who may become important

stakeholders in new entrepreneurial enterprises in their future professional careers (for example, as investment managers, bankers, politicians or journalists). This may help to improve society's overall entrepreneurship culture as this group of students, tomorrow's opinion leaders in society, is taught key elements of entrepreneurship.

So far only a few higher education institutions have explicitly directed their training towards high-growth enterprises. At most universities and colleges that are either international or national leaders in entrepreneurship, one or more growth modules have been integrated into the teaching, or activities are organized which are oriented towards spinning off enterprises from the university. In Europe, these institutions are frequently sponsored by the government on a project-funding basis; this is in contrast to the US, where most entrepreneurship centres are privately funded. However, "research shows that until today, even in the United States commercialization of university research remains differentially successful and is concentrated in just a handful of universities" (Litan et al., 2007).

In terms of an integrated approach from teaching modules on growth entrepreneurship to technology commercialization, Stanford University is an outstanding example in entrepreneurship education for high-growth and commercialization. This university can be called exemplary, both with regard to the curriculum offered and its integration and transformation into primarily technology-oriented start-ups and spin-off activities, with the focus on high-growth enterprises. In addition, emphasis is placed on growth programmes and modules creating university-business links even on an international level. One example is the programme Leadership 4 Growth for Enterprise Ireland created by the Graduate School of Business. "Leadership 4 Growth represents an important element of Enterprise Ireland's overall strategy to accelerate the development of world-class Irish companies to achieve strong positions in global markets resulting in increased national and regional prosperity" (Enterprise Ireland, 2007).

It is important to learn more from good practice cases in entrepreneurship education to identify success factors, benchmarking and evaluating impact and outcome of relevant programmes, courses and activities as well as the impact of university-business links. The results of such research may have implications for action at various levels:

Implications at the political level

From a political point of view, it has been generally agreed in most countries that there should be a policy commitment to promote learning for entrepreneurship. Admittedly, high-growth entrepreneurship is still a relatively new policy area. Action needs to be taken at all levels (national, regional and even local) to improve the framework for entrepreneurial learning and activities, especially in higher education institutions and their surroundings, taking into account different local conditions. Universities can play a key role in generating innovative start-ups and spin-offs with high growth potential. While in the United States innovative high-growth enterprises represent an essential component of entrepreneurship, in Asia and Europe entrepreneurship is often equated with new venture creation and occasionally focuses on SMEs.

In many countries, entrepreneurship in universities has not yet been sufficiently integrated into the different subjects of the curriculum, and there is scarcely any cross-curriculum link to the entrepreneurship training. One key question arising in this context is: How can entrepreneurship (and especially high-growth entrepreneurship) be integrated into the education system across all levels of formal education (primary, secondary, higher education)? It is essential for an effective entrepreneurship education that the curricula are consistent and coordinated and build on each other. The introduction of entrepreneurship into national (or regional) education systems at all levels of education is a major challenge for policy-makers.

For countries that have signed the various declarations under the Bologna Process, for example, new perspectives are opening up as regards relevance, implementation and structuring of the entrepreneurial training at higher education institutions. As a practical

measure, it would be conceivable to establish the discipline of entrepreneurship as an obligatory module in bachelor and master study courses. The integration of entrepreneurship into the curricula of all faculties is a challenge for university leaders and educators who also need to involve entrepreneurs and (local) enterprises (especially high-growth enterprises) in the design, running and promotion of these entrepreneurship courses.

Governments should adopt legislation to support these relationships. Political support can take the form of creating legal aid and tax relief, simplifying bureaucracy as well as providing financial incentives facilitating closer cooperation between universities and businesses. As the practical entrepreneurial experience is an essential element in the entrepreneurial training of students, a legal framework must be created which will allow professors and staff members of universities to work part-time with businesses.

A further role of governments might also consist in creating funding mechanisms for high-growth programmes, activities and initiatives associated with entrepreneurial education. Various focuses for funding are conceivable which may be directed at personal and institutional networks at the regional, national and international level. For example, a government can provide seed funds for student start-ups networks. In addition, public authorities can finance national and international research and education networks to expedite their sustainability and reach.

There are numerous examples: the network of UNESCO Chairs in Entrepreneurship including the UNESCO Chair Entrepreneurship Award "Entrepreneurial Thinking and Acting" (awarded first in 2007); the UNESCO UNITWIN Scheme (university twinning and networking); the establishment of the IDEA Network in Denmark and NCGE in the UK (European Commission, 2008). Beyond these more recent public efforts there are also well-established private initiatives offering potential for cooperation. For example, the European Foundation for Entrepreneurship Research (EFER), founded by serial entrepreneur Bert Twaalfhoven in 1987, is committed to improve research and teaching of entrepreneurship in Europe. The efforts of

such networks in developing and disseminating knowledge on entrepreneurship and its teaching is particularly important at the international level where less advanced regions (in terms of entrepreneurship education) may benefit from others (for example, through EFER's cross-national comparison studies and teach-the-teacher programmes).

Implications at the university level

In general, employability – the capability of participating in working and professional life – is a basic criterion for the accreditation of bachelor and master study courses. For the development of relevant competences, entrepreneurship education offers suitable starting points, irrespective of any later entrepreneurial activity. The capacity to think and work entrepreneurially can facilitate later employability relating to managerial roles and industry careers (for example, in the context of corporate venturing or internationalization contexts).

A stronger entrepreneurial orientation of universities means that their leaders must be able to promote an entrepreneurial culture at their institutions without damaging their academic or scientific status (a positive example of this leadership from the University of Cambridge is the evolution of the Cambridge Technopole). Institutions seeking to add entrepreneurial elements to academic tradition may face another challenge arising from lack of commitment on the part of decision-makers to implement entrepreneurship education across the complete institution, for instance on the basis of an interdisciplinary approach.

For an entrepreneurial university it is, however, an absolute prerequisite that university and faculty leaders promote cross-disciplinary initiatives and courses so that all students can be reached. Higher education institutions should offer incentive systems to motivate and reward faculty staff, researchers and teachers to stimulate students' interest in entrepreneurship education and to assist them in starting up new businesses. In addition, the sustainability of entrepreneurship education at universities not only entails its curricular establishment but also its long-term funding. Here, universities should not only bank

on public policy initiatives. Rather, universities should seek ways to intensify private sponsoring by companies or alumni – be it funding for specific entrepreneurship education activities or on a continuous basis (for example, endowed entrepreneurship professorships).

Establishing appropriate working conditions for university employees to found their own new businesses will be important for entrepreneurial universities or enterprise-friendly universities. Research by Di Gregorio and Shane (2003) on university technology licensing offices and their start-ups has indicated that rates of new firm formation may be higher in contexts of: a) university and intellectual eminence; b) university policies to provide investments in equity to academic start-ups; and c) favourable royalty regimes for technology licensing (maintaining a low inventor's share of royalties in order to reduce opportunity costs of company formation and to motivate staff members to start their own business for exploiting a novel technology).

Research shows that the higher the degree of innovation of a new enterprise, the higher the achieved turnover and the number of created workplaces. There is the tendency for people with a sound academic background to start innovative enterprises (Achleitner et al., 2007). This means that teaching entrepreneurship within higher education institutions but outside the actual economic and business courses should be increased, particularly in the scientific and technical faculties of universities, as it is precisely in these areas that developments with a high degree of innovation can be generated. It will therefore be important in the future to put a greater emphasis on new venture creation, especially high quality technological start-ups, with a high growth potential as well as managing the (high) growth of young enterprises in the curricula of scientific and technical areas at universities. In addition, modules such as leadership, marketing and financing for growth are essential.

Not only publications, but also entrepreneurial teaching should present the basis for evaluating institutions, departments and staff (European Commission, 2008). Measures should focus on the demands and contexts of local markets. Any assessment should focus not only on the outcome, but also on the impact.

Implications at the business or industry level

Role models play an important part in the motivation of students to undertake entrepreneurial activities. It is therefore prudent to profit from the knowledge and experience of entrepreneurs who manage their growth-oriented enterprises successfully. Entrepreneurs, but also providers of finance and other practical experts, form an essential, integral part of the entrepreneurship training at universities. Time is, however, usually at a premium. Universities therefore have to consider the incentives they can offer to motivate successful entrepreneurs to participate in the entrepreneurial education of students.

Entrepreneurs and enterprises can provide sponsorship and funding for start-ups and spin-offs created by students or graduates, especially with a focus on high-growth ventures, and can support business plan competitions or awards. Alumni entrepreneurs will play a key role in providing funding and support (consulting; bridging contacts to industry, etc.) for the next generation of student and graduate start-ups (Twaalfhoven, Wilson, 2004).

A large number of private enterprises and entrepreneurs finance entrepreneurship chairs, institutes and centres. As regards private financing of higher education institutions, the United States leads the way, where an almost unique culture of pay-back is highly developed among prominent personalities. In Europe and Asia, higher education institutions are mostly financed by the state, although in recent years many of these universities and colleges have increasingly made efforts to raise funds from private enterprises and entrepreneurs. In terms of synergies the potential for collaboration between established companies and universities and their spin-offs should be nurtured further because of the benefits evolving from such cooperation (for example, in the biotechnology sector (Zucker, Darby, 2001).

For university-business collaboration and exploitation of entrepreneurial opportunities it will be important to develop sector-specific approaches because of the heterogeneity and differences between sectors such as software engineering, renewable energies and biotechnology

(Druilhe, Garnsey, 2004). An example of such a specific approach is the Intel Technology Entrepreneurship programme, which is tailor-made for engineering and science faculties and focuses on technology commercialization and entrepreneurship. The programme is offered worldwide in cooperation with the University of California at Berkeley and trains academic faculty to build and deepen courses in technology entrepreneurship so as to foster local innovation.

In summary, high-growth enterprises are an essential element of a successful national economy, one characterized by diversity in which new businesses, small and medium-sized enterprises, corporations and high-growth enterprises all make their contribution to economic growth. During recent decades, most countries with few exceptions (such as the United States) have shown a deficit in gazelles. A specific concentration on and promotion of new enterprises with high growth potential is crucial. As discussed above, entrepreneurship education for high growth can make an important contribution. Responsible decision-makers in politics, sciences, education and economics must find common ways to create the framework for target-oriented and effective entrepreneurship education for high growth and to promote collaboration between universities and businesses.

Entrepreneurship Education for Social Inclusion

Courtesy of Goldman Sachs

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Why Entrepreneurship Education Is Important to Strengthen Social Inclusion

The most fundamental reason for thinking about entrepreneurship at the grass roots is to find sustainable solutions to overcoming the injustices of poverty. The social injustice of poverty is evidenced by malnutrition, low life expectancy, indifferent educational attainment, poor access to water, inadequate healthcare and exclusion from the benefits of economic and technological progress. Witnessing progress all around while remaining poor can also create a feeling of hopelessness, dependency and low levels of self-esteem and aspiration. These are human conditions that can tear at the soul of a people.

The arguments are well rehearsed and supported in many academic and policy documents, and they are highlighted by the UN Millennium Development Goals (eradicate extreme poverty and hunger; achieve universal primary education; promote gender equality and empower women; reduce child mortality; improve maternal health; combat HIV/AIDS, malaria and other diseases; ensure environmental sustainability; and develop a global partnership for development).

How can entrepreneurship education address these issues and create a wider participation in economic, social and health benefits?[15] This chapter sets out the context of poverty and highlights existing solutions. From these we draw inspiration to achieve a much more scalable model for social inclusion through enhanced entrepreneurship education.

Entrepreneurship has become a highly visible and popular term among policy-makers, academics and in the wider population. It is not just about a handful of Silicon Valley millionaires, but also about a widespread phenomenon across the world. At the micro-level the biggest changes have arisen through the growth of micro-credit, enabling individuals at the extreme levels of poverty to bring about improvements in their lives.

15 http://video.kauffman.org/services/player/bcpid1811456713?bclid=1785302240&bctid=1797029684

Although this is not labelled "entrepreneurship", nor is the supporting advice, mentoring and community building labelled entrepreneurship education, this is what takes place and helps to transform lives. If we look at the growth of entrepreneurship from the millionaires of high tech entrepreneurship to the millions of individuals who are self-employed – we might see that entrepreneurship is pretty much a global social movement.[16] In the past 50 years dramatic structural changes have taken place in society (Beck, 1992) causing a much greater degree of individualism, resulting in people making their own choices and shaping their futures.

How can we harness this social movement, through education, to ensure that we do not lose sight of inclusion of those whose lives are yet to be transformed by the growth of opportunity that we have witnessed?

Main Drivers for Social Inclusion Through Entrepreneurship
Social inclusion is a matter of urgent need across much of the world. Poverty indicators, the distancing of the rich from the poor, access to income generating resources, water, the impact of climate change the need for better health, civil rights and provision of basic needs identified in the UN Millennium Goals all create a sense of imperative.

Since the major changes of the early 1990s – such as the fall of the Berlin Wall and the economic policy reforms in China and India – we now have, in effect, one world economic system. This has led to a doubling of the workforce, from 1.5 billion to 3 billion. The pressures on creating jobs, incomes and sustainability have also led to large-scale economic migrations and further pressures on political and social systems.

Meanwhile, we see that entrepreneurship has become a social movement. It has become a grass roots activity, spurred on by the growth of micro-credit and the wider adoption of free market systems and the withdrawals of state subsidized enterprises.

These shifts have created a class of people around the world that face day-to-day challenges but also have hopes for a better future and it is in this context that we ought to frame a major growth in entrepreneurship education.

To enable a wider participation of those who are socially excluded, such as women, underemployed youth, those with poor health and people distant from modern markets or with low levels of literacy, we need to create markets and opportunities for innovation and social improvements. These communities are described as being at the "bottom of the pyramid" and the case is being made to draw them into the income generating capability of the modern world through appropriate and targeted entrepreneurship education.

> Over the next five years, Goldman Sachs will support partnerships with universities and development organizations that will lead to *10,000 Women* receiving business and management education. These innovative certificate programmes will help open doors for thousands of women around the globe whose financial and practical circumstances would otherwise prevent them from receiving this type of education.

The Role of Social Entrepreneurs
There have been many personal drivers for change that arise from the role model effects of seeing people in society becoming increasingly successful. A few entrepreneurially minded people have had transformational capacity.[17] These people are recognized as social entrepreneurs.

Social entrepreneurs have gone into business sectors and helped solve problems for people in their communities. They have taken the agenda beyond free trade to fair trade, created opportunities at the base of the pyramid resulting in more people with income, health, education and improved welfare.

In spite of the huge contributions of social entrepreneurs, at this level of the pyramid, scale does matter. Therefore, it is important to develop strategies to increase the numbers of people attracted to entrepreneurship education in the communities where social inclusion will make a difference.

16 "We are in the midst of a silent revolution – a triumph of the creative and entrepreneurial spirit of humankind throughout the world. I believe its impact of the 21st century will equal or exceed that of the industrial revolution of the 19th and 20th century". (Timmons, 1998).
17 http://www.weforum.org/en/Communities/SchwabFoundation/index.htm

Entrepreneurship is seen as a potential solution to many of the barriers to social inclusion and the provision of education is seen as a method for empowering these improvements. But this is not a simple agenda and on past evidence the links between improved education and incomes are hard to find, particularly it they are provided in formal but isolated conditions.

The missing piece in the promise of education seems to be the ability of people to apply their education for self-improvement and a solution to this part of the puzzle also needs to be addressed.

3.1 Characteristics of Entrepreneurial Activity

3.1.1 Definition

This part of the report defines social inclusion as a term that applies to people at the "bottom of the pyramid." The term "bottom of the pyramid" is based on C.K. Prahalad's seminal work in mapping out the world's aspiring poor, comprising 4 billion people who are joining and actively participating in the market economy. Their participation is seen as challenging long-held notions that the poor cannot participate in the global market economy, even though they constitute the majority of the population.

Annual Per Capita Income*	Tiers	Population in Millions
More Than $20,000	1	75 – 100
$1,500 – $20,000	2 and 3	1,500 – 1,750
Less Than $1,500	4	4,000

*Based on purchasing power parity in U.S.$
Source: U.N. World Development Reports

Bottom of the Pyramid (BOP)

Adapted from: Prahalad, C.K., Hart, S. "The Fortune at the Bottom of the Pyramid". *Strategy + Business*, 2002, 26: 1-14

Rationale for Narrowing Down the Definition

The context of poverty and "exclusion" is very complex. Target groups might be segmented by age, gender, and urban (Hurley, 1990), rural (Hossain, 1984) or peri-urban locations. We might segment by occupation such as fishing, farming (Bottomley, 1989), trades, the informal sector, retailing, or small-scale production (Vyakarnam, 1990). We also find enterprise among individuals and within groups or communities.

There are institutions such as co-operatives (Harper, 1992) that attempt to provide an interface between the disadvantaged and the marketplace. Thus, education and training for the staff and members of these co-operatives should be included in the target group.

The target groups are first described by a sample selection of contexts in which they find themselves (see table below). This list helps to identify various causes of poverty for which solutions are needed. The provision of entrepreneurship education is likely to be particular to each situation.

We need to understand how to match entrepreneurship education with specific target groups and how to raise awareness on the significance of entrepreneurial education for social inclusion. This is provided in the table below, which gives a sample of contexts recognized in the popular press and in development economics.

Table 4	**Contexts of Poverty**	
CONTEXT OF POVERTY	**TYPICAL CAUSES**	**WHERE**
Rural Poverty	Brought on by droughts	Africa, many Asian countries
Refugees	Due to political and other forms of upheaval	Africa and Europe
Migrants	From areas of deprivation to foreign countries	Across Europe and US
Peri-urban	Due to lack of access to land and resources	Global – in most poor countries
Indebted	Trapped in a cycle of debt to money lenders	Global phenomenon
Urban Poverty	Through industrial closures and restructuring	Global phenomenon
General Health	Physical, mental, infectious diseases, chronic illnesses	Most poor countries
Youth and Children	Orphaned or members of very large families	Africa (through AIDS, civil unrest) and most poor countries
Underemployment	Through lack of appropriate skills and opportunities	Countries with good formal education, but missing links to business
Ex-offenders	Petty crimes brought on by extreme poverty	Poor countries
Vulnerable Women	Victims of abuse, chronic ill health, etc.	Global, mainly Asia and Africa
Illiterate	Excluded through low numeracy and literacy skills	Most poor countries

3.1.2 Target Groups

Within the broad landscape of entrepreneurship education for social inclusion, specific target groups can be identified in terms of:

a) Educational attainment.

b) Focal aspects of entrepreneurship education.

c) Role played within the wider economy in promoting social inclusion.

For the purposes of this report, we will focus on educational attainment and the types of skills that could be built through entrepreneurship education.

Illiterate and unemployed

People without formal education find it difficult to secure gainful employment that rewards skills. Rather, they either fail to find employment or are engaged in manual labour that doesn't provide sufficient scope to improve their personal situation. The focus of entrepreneurship education for this target group is to provide the social and basic business skills necessary to run their own small business.

Table 5	Skills to be built through Entrepreneurship Education			
TARGET GROUP - Educational Attainment	**SIGNIFICANCE OF ENTREPRENEURSHIP EDUCATION FOR SOCIAL INCLUSION**			
	Awareness of Entrepreneurship and its impact on economy	**Social skills to become entrepreneurs**	**Basic business skills to run own small business**	**Advanced business skills to grow own business**
Illiterate, Unemployed	✗	✓✓✓	✓✓✓	✓
Semi-literate and Underemployed	✓	✓✓	✓✓	✓
Secondary Education	✓✓	✓✓	✓✓	✓✓
University Education	✓✓	✓	✓✓	✓✓✓
Society	✓✓✓	✗	✗	✗

✓   Indicates level of importance for the target group

✗   Indicates 'Not Applicable'

Semi-literate and underemployed

People from this group may find employment but only on an intermittent basis. However, through their employment, they may have acquired communication and social skills and some basic business skills and awareness for running a business. Entrepreneurship education for this group should focus on building on the basic skills that they have acquired through their employment.

Secondary Education

People with secondary level education may find regular employment, but only in menial jobs. Consequently they may be able to participate within the wider social arena, but only marginally. Their need for acquiring social and business skills is very similar to that of the underemployed target group. However, they may have the potential to grow their own business by acquiring advanced business skills.

University Education

People with a tertiary level of education from a university or a higher education institute may already possess the qualifications necessary to find skill-based employment. However, they may have to be equipped with the basic skills necessary to run their own business. Considering their educational attainment and position within society, they are best placed to acquire advanced business skills that are essential to grow their business from a self-sustenance stage to creating employment for others and contributing to the wider economy.

Society

Society at-large plays a major role in promoting entrepreneurship among its citizens through its cultural outlook and emphasis on risk-taking vs. risk avoidance and success vs. failure. A better appreciation of entrepreneurship and its role in promoting wider economic development may help remove some of the social stigma associated with failure in an entrepreneurial venture. There are additional ways of support for entrepreneurship such as providing financial and other material support to aspiring entrepreneurs during their early days of starting up a new venture.

As a sub-set of societal awareness of entrepreneurship, there is a need for relevant training for those who are involved in the promotion of enterprise, supply of credit, development of regulatory frameworks and business development agencies in general.

Examples of Entrepreneurial Self-help

As with many innovations and programmes, the real driving force for grass roots empowerment came from an outsider[18] – Mohammed Yunus – who founded the Grameen Bank to provide micro-credit to the poorest people so that they could lift themselves out of poverty. Mohammed Yunus is an entrepreneurial academic who has made a big difference to millions of people.

In the Table on the following page we illustrate a number of programmes that include enterprise within the body of their actions and where by implication entrepreneurship education is provided. These tacit forms of education are both highly prevalent and embedded in the activity, without using the label of entrepreneurship education.

18 http://www.grameen-info.org/

Table 6	Enterprise Programs

TARGET GROUP - Educational Attainment	ENTREPRENEURIAL SKILLS DEVELOPMENT FOCUS			
	Awareness of Entrepreneurship and its impact on economy	Social skills to become entrepreneurs	Basic business skills to run own small business	Advanced business skills to grow own business
Illiterate, Unemployed		Honeybee and Sristi are organizations run by an academic from the Indian Institute of Management in Ahmedabad aimed at encouraging real enterprise.	Microloan Foundation - A UK-based microfinance charity working with women in Sub-Saharan Africa. It providing small loans, basic business training, ongoing mentoring and facilitation of savings. Rural banking programme in Latin America[19].	
Semi-literate and Underemployed	Entra 21 is a USAID funded programme for developing entrepreneurial and technical skills to jobless youth in Latin America.	Organizations focusing on gender, unemployment, youth, homeless, rural, socially marginalized, refugee and a variety of other categories – all of which try to develop very basic commercial skills, together with the provision of technical skills and/or access to loans. See for example the work of GTZ – the German aid agency[20].	Transformational Business Network members support micro-, small, and medium enterprises in developing countries by contributing time and skills, mentoring developing entrepreneurs, and investing in emerging businesses. TechnoServe is a non-profit economic development organization helping entrepreneurial men and women in poor rural areas build profitable businesses creating income, opportunity and economic growth.	
Secondary Education	Young Achievers from US celebrates the work of young people who have made a difference. Duke of Edinburgh Awards in the UK assists young people to take on personal challenges, whether these are physical or social, and thus provides self-esteem opportunities.	Junior Achievement-Young Enterprise programmes focus on entrepreneurship and skills development for students in primary and secondary school.	Junior Achievement-Young Enterprise. See box left.	Junior Achievement-Young Enterprise ➜; Core programs focus on entrepreneurship and skills development for students in primary and secondary school.
University Education	Junior Achievement/Young Enterprise has graduate programmes for entrepreneurial skills development. Young Enterprise inspires young people to gain an understanding of business, learn financial, social and leadership skills. Honeybee and Sristi are organisations run by an academic from the Indian Institute of Management in Ahmedabad.	Leadership has grown as a campus based activity around Universities to develop leadership qualities among graduates. Honeybee and Sristi are organizations run by an academic from the Indian Institute of Management in Ahmedabad.	Students for Free Enterprise – There are 38,000 SIFE students in over 1,500 SIFE teams across 47 countries. Mainly social enterprise projects, working with not-for-profit organizations.	Business plan competitions New venture courses Boot camps Venture capital conferences Venture fests
Society	*Dragon's Den* is a BBC programme popularizing entrepreneurship through broadcasting investment pitches and portrayal of successful entrepreneurs' lives and how they made it.			

19 http://www.iadb.org/sds/doc/319014villagebanking.pdf
20 http://www.gtz.de/en/themen/wirtschaft-beschaeftigung/869.htm

These projects and those like them all over the world are great sources of voluntary effort and make local impact. They are very practice based and do not pretend to have any academic foundation or theory from which they are derived.

However, there are a few institutions around the world, such as the Entrepreneurship Development Institution of India (EDII), that have embraced personal development at the heart of what they do. They have blended practice with theory. Much of what they have developed is derived from early work on motivation theories – such as those of McClelland (achievement motivation) and E.F. Schumacher (Small is Beautiful) – and their faculties are familiar with business development, banking principles and economics. Because their funding comes from the more formal institutions, they are also obliged to deliver "business ready" delegates.

3.2 Opportunities and Challenges

Addressing the bottom of the pyramid gives us two clear sets of opportunities:

1. The prospect of people at the very bottom being able to lift themselves off the lowest income levels through "grass roots empowerment." This form of social inclusion also creates a stronger sense of community, increases self-confidence and reduces feelings of helplessness and hopelessness.

In this scenario, the forms of assistance include carefully listening to the people, identifying local problems and solutions and putting in place entrepreneurial business models that can solve the problems and generate income. They can be micro-enterprises in food, water, health, farming, fuel, textiles/clothes, retail and a myriad other local products and services.

2. The other prospect is of linking modern companies to people at the bottom of the pyramid.

In this scenario, modern corporations adapt their products and services to make them affordable for the poor. This requires new forms of innovation in product design, packaging, distribution and pricing. The strategy enables the growth of new forms of enterprise in the supply chain.

These new forms of engagement, which go beyond corporate social responsibility, mean that the businesses are sustainable in the long term and create new forms of engagement and interactions, creating further scope for opportunities.

Philosophical challenges

At a philosophical level there are growing arguments about whether the bottom-up forms of entrepreneurship development will ever generate much more than a marginal increase in incomes, while the top-down forms are thought to shift the burden of inventory and credit risk from big companies to those on the margins.

If we allow these challenges to prevent needed policies, strategies and action we achieve nothing. In fact, over the decades of experiments we have seen that business education has evolved in drawing together three mainstream sources: industrialization, SME development and training for skills; we can see why to some extent entrepreneurship education can easily be confused.

In addition to these philosophical debates, there are many other challenges such as:

- Many schemes, programmes and projects are ad hoc.
- Often programmes are not based on hard evidence of need and design, so they can become anecdotal.
- Curriculum and delivery are often disconnected with the context of the people engaged in entrepreneurship.
- There are few well developed measures efficacy in entrepreneurship education.
- Well-trained trainers and relevant materials are in short supply or hard to find.
- The role of education presently does not include the need for inspiration, confidence building and generating social networks.
- Curriculum in entrepreneurship is mainly focused on individuals, but much of life at the base of the pyramid is community oriented.
- Governments may be threatened by free market economics due to the vulnerability of much of the population, hence the need for price controls, which are "anti-entrepreneurial".

- Cultural barriers of envy, uncertainty about free markets, and suspicion about the term entrepreneur, links to political power base and other negative connotations are also major challenges.

Evolved solutions that provide opportunities for a new form of entrepreneurship education

Largely lead by universities and business schools, *Industrialization* fostered business and management studies, curricula and tool kits, and trained people for analytical and strategy making skills for big business.

SME development has brought us a generation of role models, simple tools and training materials for start-ups and the management of smaller firms. It may also have left us with a legacy that entrepreneurship is about small business and therefore we have also to deal with this false distinction. But let us come back to this later. Largely led by government agencies, not-for-profit organizations, and banks and state agencies they use universities and business schools as providers.

Skills training in sales, communication, team formation, taking initiative, creativity, planning, project administration and so forth has given us a broad spectrum of approaches to use at grass roots levels. Such approaches are mostly led by not-for-profit organizations, trainers and consultants and are funded by regeneration budgets in inner cities, rural development, micro-finance institutions and the like.

Each of these three sources has contributed to building entrepreneurship education, but none of them is complete and we need to find a model that brings together aspirations, with intent, skills, knowledge and current thinking on entrepreneurship development.

The big audacious goal for entrepreneurship education

Entrepreneurship education for social inclusion itself is not new. Much is being done, albeit in ad hoc projects, sometimes without the benefit of real understanding on the supply side and with apparent disconnect between policy ambitions and grass roots realities.

The deliberations that take place as a result of this report should move towards creating a powerful single vision for entrepreneurship education that can enhance social inclusion. Using the Grameen Bank as a metaphor we urge senior policy-makers and captains of industry to engage in the formation of this vision.

3.3 Existing Practices
3.3.1 What to Teach

Agree a Headline Definition of Entrepreneurship Education
In summarizing the education menu, studying the different contexts and reflecting on all the approaches we can draw a boundary around entrepreneurship education as comprising the following three components:

Personal development
Entrepreneurship education should build confidence, motivate progress, strengthen the entrepreneurial mindset, foster a desire to achieve and inspire action.

Business development
Technical, financial literacy and skills to engage in self-employment, employment and in entrepreneurship that can lead to self-improvement. This would include the expected business and functional curricula.

Entrepreneurial skill development
Entrepreneurship education should provide training in social skills, networking, creative problem solving, opportunity seeking, selling, interviewing, presentations, group leadership, community co-operation, dealing with bureaucracy, local cultural norms and how they affect business, etc.

For each of these components a detailed curriculum and delivery mechanisms must be developed. The overall plan might be drawn together in the way described by the figure below.
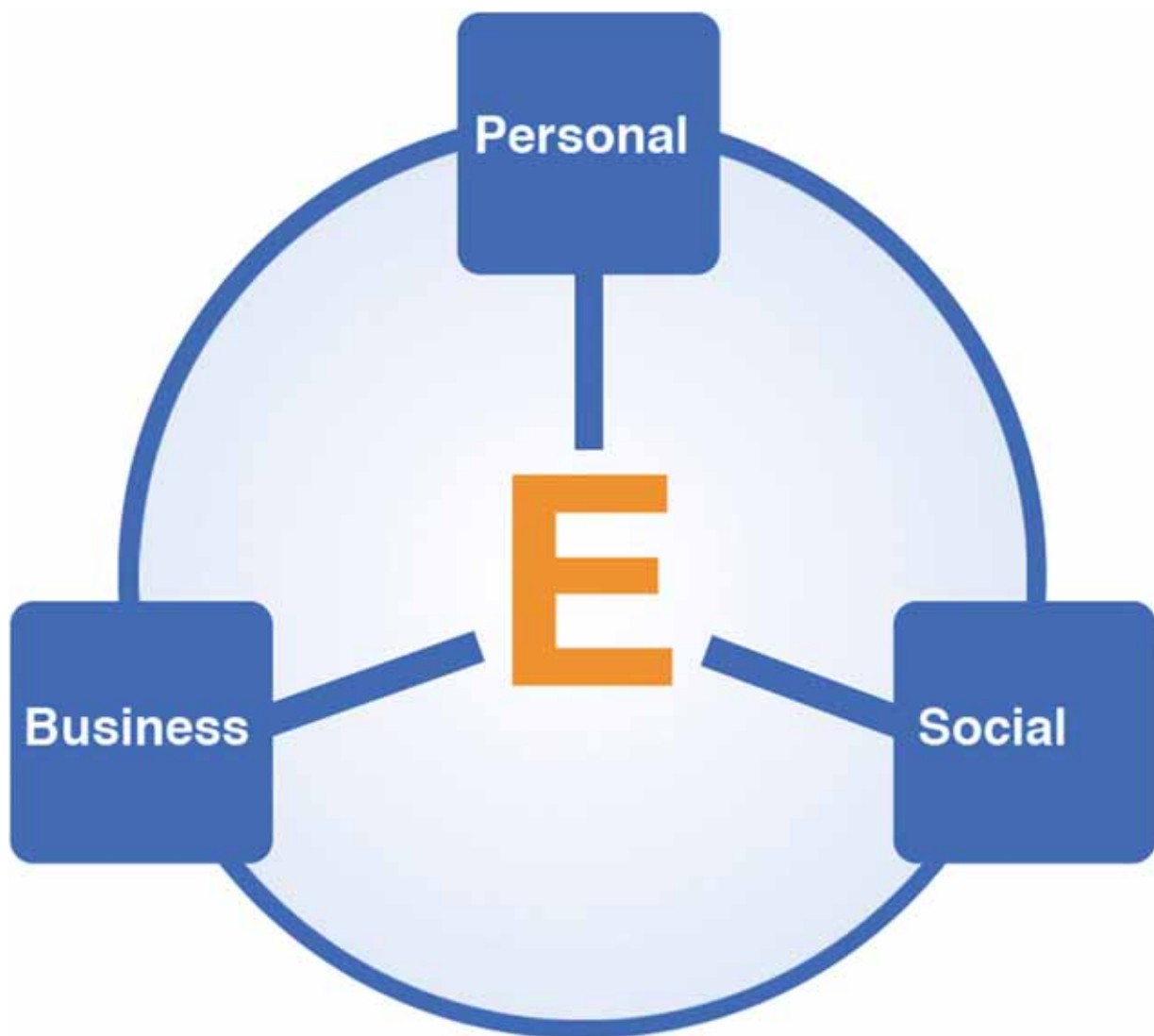
Portfolio of Courses According to Needs

From national, regional or institutional perspectives, the provision of entrepreneurship education should be viewed in terms of a portfolio. The Table below highlights the approach being taken in the UK at a national level and at an institutional level at the University of Cambridge. Not everyone wants to become an entrepreneur or pursue self-

employment. Those who do need different forms of entrepreneurship education depending on their personal situations. By having a portfolio we demonstrate respect for our target groups, by providing a road map – so that they can elect to take the form of entrepreneurship education that best meets their needs.

Table 7	Examples of Entrepreneurship Programmes in the UK	
	PROGRAMME/ACTIVITY	**DESCRIPTION**
1	**Enterprise Insight**	Flagship campaign activity across the UK, includes the Global Entrepreneurship Week
2	**National Council for Graduate Entrepreneurship**	Boot camps and workshops are based on "Flying Start", aimed at graduates in computer sciences, arts and technology. It provides a national resource base and conferences
3	**Shell Step**	Long running internship programme
4	**Junior Achievement/Young Enterprise**	These programmes have a very wide reach and are youth focused to inspire and provide skills for future employment and self-employment
5	**Regional Agencies**	Regional Development Agencies in the UK have a variety of programmes, funds and infrastructure provisions to stimulate enterprise
6	**European Union Social Funds**	Regional projects have been extensively funded for regeneration in deprived areas
7	**Specialist Schools and Academies Trust**	A large affiliation of over 150 schools and colleges sharing resources, insights and evaluation methods
8	**Government "Job Centres"**	Promoting self-employment and "how-to-courses" via Chambers of Commerce and Enterprise Centres
9	**Networking Organisations**	Institute of Small Business and Enterprise, Enterprise Educators UK and others to promote exchange of research findings and practice of teaching
10	**Courses that exist within Universities**	Some institutions have a single major provision, others have created a portfolio of courses (e.g., University of Reading and the University of Cambridge respectively)

Entrepreneurship Roadmap

	Year 1	Year 2	Year 3	Post Doc
Entrepreneurial Awareness	Entreprise Tuesday*			
		Membership of CUE and CUTEC committees		
Development of Entrepreneurial Skills		Life sciences Entrepreneurship lectures*		
		Entreprisers*		
Idea Evaluation and Opportunity Recognition		Emerging Technology Entrepreneurship*		
Business Case Development			Ignite*	
Hands-on Entrepreneurial Skills			Business creation competitions	

Note: only programmes marked * are offered by Centre for Entrepreneurial Learning (CfEL), Judge Business School

Personal Development Blended with Business Development and Social Skills

In the area of entrepreneurial learning, where so much has been received wisdom from business schools and management development, there is a growing body of literature that entrepreneurial learning needs to focus as much on personal development and social skills as on business development (Rae, Carwell, 2001). This would argue for a blended learning experience where business knowledge and skills are combined with the best of tools and approaches taken from training events.

However, we need to draw on sound platforms of knowledge and understanding about personal development. Otherwise we risk a fair accusation that we are merely running feel good events without measurable, tangible outcomes and unrelated to any particular understanding of human aspirations, behaviours and motivation. In our work, we wish to draw on McClelland's – Achievement Motivation (Hansemark, 2003) and Bandura's - Self Efficacy theory (Bandura et al., 1999).

Challenges to Achieving the Introduction and Scaling up of Entrepreneurship Education

National governments, corporations and other agencies need to build a portfolio of courses that spans a full range of activity from national level campaigns through to local delivery.

Entrepreneurship education is more than just "strategy made simple." If it is agreed that we need to build personal confidence, business knowledge and entrepreneurial skills then it is also clear that recommendations must include a portfolio approach. Within that portfolio we need to consider

what and how separation is made between primary and secondary educational engagement in entrepreneurship education; what is taught through informal means (by project-based learning), and how trainers and policy-makers can be more effectively engaged in the agenda.

If the agenda is to achieve scalability in entrepreneurship education there is a need to increase the quantity and quality of people on the "supply" side – finding enough people with the skills, knowledge and experience to act as tutors/trainers and enablers.

Such a grand scale cannot be achieved on short-term project-based funding. New models need to be found where this form of education is funded in the longer term as a discrete activity and/or as part of a "side-car" activity alongside other programmes in education, health, water, credit schemes and the like. Creative, long-term and sustainable solutions need to be found to ensure that entrepreneurship education is available for a long enough period to make a difference.

As mentioned earlier, the links between entrepreneurship education and results are tenuous. This, in part, is due to fallacious indicators demanded by funding agencies who seek "start-up" numbers from entrepreneurship programmes, rather than seeking clarity about the purpose of the training or educational event and measuring the outcomes against the original objectives.

The main challenge is to have clarity about the objectives of the entrepreneurship education and then design measurements for those achievements. The analogy with industry would be to design the equivalent of Key Performance Indicators (KPIs) or to use a broad-based model such as the "Balanced Scorecard."

Many educational programmes are simply measured for what one might call the "clappometer"; or educators are asked, "how many businesses were started as a result of such and such a programme?" While both these instruments and questions might shed some light they are extremely limited in giving taxpayers and donors the answers to questions that need to be asked.

The challenge is to better understand what does or what does not work in terms of the efficacy of entrepreneurship education.

3.3.2 Where to Teach

Entrepreneurship is learned as much as it is taught. The delivery mechanisms for where to deliver entrepreneurship education need careful consideration.

Awareness and Societal "buy-in"

In seeking to create awareness and social acceptance of entrepreneurship, careful thought needs to be given to the role of media. Television and radio can present cases, news, information and engaging programmes to deliver a more positive message about enterprise and entrepreneurship. This is quite important to help overcome negativity that might exist in society and where low trust in free markets persist.

In addition to mass media, NGOs and other grass roots agencies might be brought together (like the Global Entrepreneurship Week) to help engage people more directly through schools, community centres, village halls, church and other religious organizations.

For Education that Seeks to Inspire an Entrepreneurial Spirit

Significant delivery channels are through major programmes run by such organisations as NFTE, JA/YE, SIFE and others, all of which work through volunteers. Their routes to scalable operations are through schools, colleges and universities, where they tap into the spirit of voluntarism and a need for extra-curricular education and so achieve major programmes at the grass roots. This is a valuable channel that needs to be further explored.

3.3.3 Who should teach

The question of who should teach is quite complex. Whoever does it needs to have a very high level of credibility in the eyes of the recipient. This general statement applies to all educators. In the context of entrepreneurship education, credible educators should that the following characteristics:

- They have a real grasp of arguments "about" entrepreneurship and "for" entrepreneurship. This would be based on a real understanding of literature and debates and not just on anecdotes and recent single venture experiences.
- They understand that there is more than one way in which people learn (Kolb, 1981), and that educators need to tap into individual motivations, circumstances and make sense of the wider ecosystem in which individuals continue their enterprises.
- They have a real grasp of the practice of enterprise, through the experience of more than one type of venture. Especially, when being from the same cultural/economic background they are able to relate to the nuances of context when imparting the education.
- They have social capital that permits them to link their students with people who can help them, such as bankers, customers, suppliers and business support agencies that can help navigate through the bureaucracy.

To achieve scale, a large supply of teachers will be needed. We might draw on the inspirations from organizations such as SIFE, NFTE, JA/YE and others and seek out alumni of successful social enterprises that can help with providing mentors and educators. Another route might be to seek out managers from larger companies willing to provide instruction.

To create this enlarged supply of educators there needs to be a very large-scale programme for training the trainers. They will need to understand context, content and methods of training and education. Although they may be a "free resource" they will need to be trained and some level of quality control will be needed if there is to be an impact on the recipients of the education.

Examples of Responses to Poverty Alleviation and Social Inclusion that Have Entrepreneurship Embedded within their Programmes

At the extreme levels of poverty – there have been many solutions to creating opportunities for the very poor. Whether one sees them as forms of self-employment or cares to re-define entrepreneurship does not matter much. These are intellectual debates for academics. What matters is that the lives of people at this level are improved.

In terms of enterprise education, many of the solutions to poverty can be seen as informal routes to education as people "Learn by Doing." The mainstream of solutions includes the provision of microfinance; innovation and creativity to help find new income streams; technical and design solutions, and access to market.

Microfinance – finding solutions for the unbanked and unbankable

Examples of successful microfinance organizations include:
- Grameen Bank – Microcredit - perhaps the best known
- Jamiibora – Microfinance and family improvement
- Basix India – Microfinance and technical support
- ROSCAS – Rotating Savings and Credit Associations

Innovation and creativity – to find new solutions for social, economic and health issues

Examples include:
- Sristi – unlocking market facing ideas for rural poor
- Stanford – d.Lab
- Practical Action – Long established appropriate technology organization

Access to markets

Examples include:

- AMUL – milk cooperative established in 1946 in rural India
- ICICI – bank in India – Connecting lending and banking services in a supply chain to enable increased access to livelihood businesses to connect with markets.[21]
- GEN Initiative – connecting individuals in rural communities with "modern" India.[22]
- Cooperatives – buyer and seller based – to provide more of the profits to the grass roots people involved

Technology based solutions

Examples include:

- MIT D.Lab – engaging higher education in local solutions = technical and affordable
- Stanford University – design for extreme affordability
- Practical Action – long established organization providing appropriate technology solutions
- Dristee – providing ICT connectivity across villages and thus opening opportunities for Internet cafes and services

Social business (social enterprise)

Examples include:

- Grameen phone is a major example of where modern management is applied to reach out to the poor.
- Fair trade organizations – where the modern retail sector is engaged in passing more of the profits to the producers. There is a very large portfolio of products – from vegetables, fruits through to clothes and crafts.
- Society desires certain goods and services that neither government nor individual firms can or will provide yet they are crucial to the well-being of society. This includes community centres, local self-help projects, resource centres, and so on. It is in these areas that social enterprise has traditionally been most effective and helps to uplift the culture and quality of life of the communities.

Ideologies and Institutions Providing Solutions

The delivery of many of the solutions – especially directed at poverty alleviation – is based on a set of ideologies and institutional frameworks as summarized below.

Charity-based interventions

Often religious organizations have played a strong role on providing food, healthcare, social and other forms of relief. Oxfam, LiveAid, Cafod are just a few of many examples of both religious and secular forms of support.[23]

Government-based interventions

At national, regional and local levels, governments provide laws, tax and fiscal regimes, set the economic climate, and support the establishment of education, technical development, healthcare and other civic services. They assist in the creation of clusters and industrial zones.

However, too often governments disadvantage entrepreneurs and the firms they create through the imposition of regulation, often outdated and trivial. One of the unintended consequences of this is to "criminalize" entrepreneurship, because conflicting legislation means that entrepreneurs are simply unable to comply and therefore "break the law." The negative image this portrays in society hinders further development of entrepreneurship.

Government actions can be most effective where they improve the environment for entrepreneurship and business growth, through skills training and infrastructure. Specific and targeted initiatives can also be helpful. However, due to political processes, policy-to-implementation disconnects and lack of real awareness of the connections between the theory and practice of entrepreneurship among policy-makers, there continue to be many barriers to real progress.

21 http://ifmr.ac.in/cdf/downloads/marketsaccesspovertynov07.pdf
22 The author of this chapter of the report is Trustee of this charity
23 See www.charity.org for further examples

Not-for-profit organizations or social enterprise

These organizations have emerged as a major force for change from bottom-up perspectives. As illustrated in the chart below, many community-based, self-help groups have been established to solve local social, economic, health and other problems:

Table 8	
Social enterprise as initiated and run by NGOs (e.g. Liberian Widows Initiative; Accord Tea plantations; Jamiibora in Kenya; Honeybee in India)	These appear to be initiated by individuals who are either from the area or have been introduced to a problem and through personal passion and effort have developed an NGO-based solution. They seem to have significant local impact on progress in economic and human terms. This is perhaps one of the most widespread models across the world.
Social "corporate" enterprise (e.g. Grameenphone, AMUL)	The examples of Grameenphone and AMUL represent direct intervention of reaching out to disadvantaged communities by well-established large organizations. There may be questions about whether this is really a form of enterprise or another (and effective) model for employment. There are further questions about whether this model also simply shifts risks (through microfinance) to the poor. These organizations have very large scale impact on rural economies and may well be the models to consider in much more detail in terms of their replicability because they have been created by somewhat individualistic visionaries. They need to create infrastructure on a very large scale and this can only be achieved by creating institutions based on modern competent management structures.
Microfinance based projects (For example, Grameen Bank and ROSCAs)	Perhaps the most widespread empowerment of poverty alleviation through the provision of microcredit. In essence these strategies attempt to provide access to loans for the "un-bankable" (people with no collateral or stable incomes) so that individuals can give themselves an opportunity to succeed. Some of the copycat projects that have followed the original organizations are coming under scrutiny about whether they are profiting from the poor or actually empowering the poor.
Co-operatives (buyer and seller coops such as Mondragon in the Basque region of Spain)	These have been set up worldwide to bring local farmers and other forms of "enterprise sectors" together to provide efficiency in the market place – providing market channels or more purchasing power for supplies.
Savings banks (Many all over Europe)	This model is somewhat different from community based lending because it first encourages people to save and then to be able to borrow against the savings (and track record). Different from Grameen which is based on the un-bankable being provided credit through community-based collateral.

There have also been major successes with what one might describe as "Guru-based" models where individuals with a passion have taken up a particular area or problem and tried to make a local difference. The best recognized model on a global basis is of course Grameen Bank. Other examples include The Transformational Business Network,[24] where business solutions are applied to not-for-profit projects in order to empower people into enterprise and self-sustainability.

Free market economic system

Free market approaches have taken centre stage in the past 25 years. The assumption is that a more liberal marketplace and institutions that support a free market can create conditions in which individuals will have opportunities to make social and economic progress.[25] Of course, in the current climate free markets have taken a beating through the credit crunch and the huge level of state aid being given to financial institutions that violated decent behaviour and self-regulation in a free market.

Setting aside the current crisis of confidence in free markets, the overall approach has created a climate or ecosystem that is favourable to enterprise by reducing duties and import/export bureaucracy. It is not yet fully opened, but the direction seems to be clear. (India and China are major examples of this approach). Sadly, the opposite appears to be the case in many African countries that have failed to benefit from the past decade of economic stability and growth. Africa appears to have been left behind and poses a serious challenge for both national governments and multilateral agencies.[26]

Within the debates about free trade one needs to take account of "fair trade." The stalled Doha Development Agreement[27] talks including market access of the World Trade Organization and the protectionist approaches of wealthy countries means that to attain real social inclusion through fair trade and not necessarily through aid programmes is proving difficult. This poses an ideological challenge to the promotion of free enterprise by the very

organizations that obstruct fair trade, because at the low income levels and in markets where competition is almost perfect there is need for fairness. The monopolistic behaviours of corporations and resource rich countries that promote free trade without promoting fair trade are a retrograde step. However there has been a growth of fair trade due to consumer actions.

Corporate Social Responsibility

Large, often multinational corporations have always been part of the landscape of commitment from employers to engage with the communities in which they operate. There are many examples from around the world.[28] Ms Ayodeji Megbope owns No Left Over, an outdoor catering outfit in Lagos, Nigeria. Although she never went to a catering school, her food is comparable to that of a professional chef. She cooks both national and continental dishes. After secondary education, she went to a secretarial school. In a society that believes so much in qualifications, that Ayodeji did not go to University undermined her confidence and made her feel inadequate. In 2006, she started her catering business. She felt she did well as she never borrowed money from anyone after the first year. However, she knew something was missing and she needed more than being able to cook good food. In 2008, she won a scholarship to develop her entrepreneurial management skills under the Goldman Sachs *10,000 Women* initiative at the Centre for Enterprise Development Services (CEDS) of the Pan-African University.

The *10,000 Women* Certificate in Entrepreneurial Management (CEM) is the flagship executive entrepreneurial management programme offered at CEDS. It is a 30-day, 12-module course spread over five months so that participants can learn and practice at the same time. The course covers all the functional areas of entrepreneurial management, including Finance & Accounting, Human Resource Management, Business Planning, Sales & Marketing, Legal, Tax & Regulatory Compliance, Environment of Business and Customer Service.

24 http://www.tbnetwork.org
25 See for example the work of the Adam Smith Institute and the effects of the structural adjustment programmes of the World Bank and the IMF
26 http://www.un.org/apps/news/story.asp?NewsID=22115&Cr=least&Cr1=develop
27 http://www.wto.org/english/thewto_e/whatis_e/tif_e/utw_chap5_e.pdf
28 See for example http://www.10000women.org/; http://download.microsoft.com/download/d/2/5/d2513e64-0dcd-4ef6-89c4-c99ee117936f/EUPolicyHandbook/
   CorporateSocialResponsibility.pdf

After completing her CEM programme, Ayodeji's transformation became obvious in at least three key areas:

- **Confidence level:** Ordinarily, Ayodeji felt she had nothing to offer and was never thrilled talking about her catering business, especially considering her educational background. After training, she understood her unique value-proposition to her customers and talked about it at every networking event she went to. During the visit of a small Goldman Sachs group to Lagos, Ayodeji was undoubtedly the best and the most natural of all the CEM participants that spoke at the reception attended by over 200 guests, including many local business leaders. Her husband commented: "My wife would never have been able to stand up in public four months ago, talk less of speaking so eloquently like this!"

- **Prospecting:** Ayodeji learned to analyse and cost each job accurately. Her presentation skills have improved and she uses PowerPoint for presentations during prospecting. Follow-up and quotations are done by e-mail. Customers now perceive her as a serious-minded professional. Her revenues increased by two and half times in September 2008.

- **Keeping business records:** A month before finishing the *10,000 Women* programme, and 22 months after starting to trade, Ayodeji opened a business bank account. She kept a record of revenues and expenditure and paid herself a salary. According to her, "I keep my personal expenditure within my salary." This helps her to budget more accurately and plan further for growth.

"Despite not being a graduate and operating in a very difficult business environment, Ayodeji's story is an example of what business/entrepreneurial education could do for a female entrepreneur that would otherwise have been excluded". Peter (Banky) Bamkole. CEDS, Lagos, Nigeria.)

3.3.4 How to Teach

This section lays out some of the menu that is available to educators.

In the figure below we can see that there is a very large selection of approaches, everything from the traditional classroom lecture style to informal learning, simulations, cases, through to reflections. The actual methods selected for a particular course/programme need to be based on the identified needs and to blend the three elements of entrepreneurship education: personal development, business development and social skills.

Personal

Business

Social

Classroom
Informal Learning
Mentoring
Networking
Simulations
Internships
Case Studies
Metaphors
Rich Pictures
Action Learning
Reflections

The Menu

The wider ways in which these major educational streams have influenced pedagogies can be seen in the range of experiments listed below. The list is included here as a general menu and relevant items from the menu can be used in appropriate contexts.

Entrepreneurial processes

The dominant approach is Entrepreneurial Processes as summed by Moore whose starting point was "past the idea generation." His focus being on "Making it happen." Timmons work is very similar but his work refers to "enactment." We described these earlier and suggest that they draw on the wisdom of Business Schools – where we suggest that the content looks a bit like "strategy made simple" – because much of what is taught in entrepreneurship classes is also what is taught on MBA programmes in the mainstream curriculum, but with an "entrepreneurial fizz"[29].

Use of simulations

Many forms of simulation are available. They can be a powerful method as a typical educational environment is short on time and needs approaches that can form the basis of a useful set of lessons in a de-briefing with the students. Here are four examples:

- Creativity sessions can result in ideas to be taken forward. This is quite labour intensive and requires group work as well as directed learning. An environment has to be created in which individuals can be creative as well as learn about their creative ability. The ideal situation is that individuals and groups generate meaningful ideas that can then be taken forward for further development.

- Writing business plans for ideas given to students is an often used model in academic institutions to teach people how to develop plans and bring the various strands together. Unless these simulations are a means to an end – i.e. to help people bring all their ideas together, the activity can soon become sterile. The skills it develops are rigorous analysis, writing and communication, teamwork and "joined-up" thinking.

- Computer-based business simulations are available off the shelf and are used in time-constrained environments. These are starting to look dated now compared to games (like Slim City and others) coming from the games industry.

- Students can gain enterprise experience by running a real business for a defined period of time. These are the most difficult to implement, but they can be rich in lessons for individuals because of the real life simulation they contain. This is not a new model as it has been run in various formats for over 20 years[30] by Professor Malcolm Harper who has focused on enterprise education, policy, finance, training of trainers in a diverse set of contexts.

Use of case studies

Case studies are frequently used in universities and business schools. They are not easy to teach as the faculty member needs to have a deep insight into business and the case itself. However, this model of teaching is used very widely.

Case studies are best used for efficiency of learning certain key points, including how to actually get started, the nature of correct paperwork, marketing and contacting customers, dealing with suppliers, employing family members, ensuring the maintenance of cash flow, and other day to day business issues. Well-taught cases are long remembered and useful. They are highly "guru-dependent."

Cases specially developed to highlight a particular lesson are powerful. However, case studies can rarely bring about the inner passion that individuals might have for their own ideas. The most passion and interest in a case and its lessons are those brought to class by students through their own ideas and business plans.[31]

Metaphors

It is sometimes hard to communicate very new ideas, whether these are for business or for a new concept in education. Hence the use of metaphors can be truly helpful. Tutors need the skills to draw on metaphors and need to help students learn the benefits of such tools to

29 The author of this chapter of the report recently attended as a guest a Harvard case study discussion on an entrepreneurship module. The case was about strategy for a fast growth company and all the analytical tools used looked much like any other MBA class discussion.
30 http://www.alibris.com/booksearch?qwork=8000291&matches=7&author=Harper%2C+Malcolm&browse=1&cm_sp=works*listing*title
31 http://www.alibris.com/booksearch?binding=&mtype=&keyword=harper+and+vyakarnam

describe their own ideas to audiences who might be sceptical. In other words, this is a form of communication skills that potential entrepreneurs need to give themselves credibility with potential customers, investors, team members and the wider community.

Action learning

The essence of action learning[32] is to present questions or tasks for a team of people to answer or solve. These need to be somewhat open ended so that the team can work on the meaning of the question and give themselves a set of sub-routines that enable them to solve the question. Although first developed in large organizations[33] for management development, this technique has wide application in entrepreneurship development as it is practical and highly interactive. A few examples are cited here.
- Creativity sessions – to solve a particular problem
- Project or business planning
- Building something – as part of a simulation
- Taking on a real project for a "client"
- Investigating the cause of a problem
- Conducting market research for a new product or service

The key to setting up an action learning environment is to be tolerant of ambiguity when setting the task, so as to allow students to discover and internalize more of the lessons for themselves.

Tasks as a subset of action learning

Simple classroom or group tasks are a subset of action learning, where the latter builds on bigger (perhaps ambiguous) questions from which the groups can learn. Tasks on the other hand are very clearly defined routines.

Tasks are important sources of exposure and experience for people to learn by doing and to build confidence that they can achieve whatever they set out to do. For some people, shyness and inhibitions can be overcome through tasks.

Tasks are also a good way to establish the desire and motivation to make things happen. Entrepreneurship is as much about doing as it is about the idea – so enabling people to perform tasks within a safe environment is a great way to build confidence.

Typical tasks might include:
- Making short presentations and self-introductions
- Team building task that involves dexterity, thinking, planning and accessing resources
- Understanding team roles, appreciating different roles as a debriefing
- Collaborating to complete a bigger task
- Designing and performing a cabaret that brings together lessons from a course

Rich pictures

Rich pictures involve providing delegates with colour pens, papers, etc, and giving them freedom to express themselves about concepts such as personal motivations, values and ethics. These are really helpful in getting group discussions going as they dig underneath self-introductions and can take an ice-breaking session to a deeper level. In entrepreneurship education, they may help to debunk stereotypes and define what entrepreneurship means to people. This technique can also be used to unlock personal stories and backgrounds to help build trust within a group or community and to encourage sharing.

32 The extensive work by Reg Revans provides useful backdrop to this approach
33 http://en.wikipedia.org/wiki/Action_learning

Rich pictures are often used in training sessions.[34] It is a standard way to unlock creativity by placing a key word in the centre of a sheet of paper and asking people to expand outward with words and pictures the ideas they come up with in terms of needs, solutions, materials, and so on. This technique can be used in the first stages of a creativity session to explore potential business opportunities.

Reflections

Individuals who are being encouraged to modify the way they think and behave need to have time to reflect on what they have learned and how they will internalize lessons and ideas. Time and tools for reflection include:

- Quiet time with a diary or learning log. This requires discipline
- Writing a letter or note to oneself
- Talking through the insights with a facilitator or mentor
- Committing to take action that comes from the desired new behaviours

It is important in any learning environment to build in time for reflection, especially with expectations of new behaviours.

Standard lectures

Standard lectures are perhaps the most conventional way to deliver new information and insights. Nonetheless, they are a very efficient method – and can be as interactive and lively as the speaker makes them.

The course tutor needs to cover information, concepts that are more easily taught through a standard lecture using boards, flip charts, presentations, and so on. This is a very academic approach that may require pre-reading and group discussions.

Guest speakers – practitioners – often provide great role model effects.[35] There is a danger with guest speakers that they get onto a hobbyhorse of their own and do not respect the needs of the curriculum. Guest speakers need very careful management, both in terms of respecting their input and in ensuring that they deliver what is asked of them. The tutor typically places himself or herself in a "middle-man" position and care has to be taken.

Having raised the cautionary note, there are many points in favour of working with guest speakers to deliver practical tangible lessons because they bring a very high level of credibility and passion that can inspire students.

" What we do is a joint presentation. The University faculty facilitates the session while the guest speaker sits in. He therefore sets the tone, pace upon which the guest speaker rides on. Even in cases of disagreement, it is still within the set framework. Never should a guest speaker be left alone 100%."

Peter Bamkole, Director,
Centre for Enterprise Development Services,
Pan-African University

Entrepreneurship education for the supply side

Social inclusion is not just about training the "poor." It is also about training those on the supply side of policy, including educational institutions, civic organizations, business development agencies and NGOs.

What to teach

This target group needs to discuss the role of entrepreneurship education, entrepreneurial finance, fair play, regulations, managing civic administration, banking rules and so forth. They need to understand and feel the emotional content of entrepreneurs, the mindset of individuals who put their families and livelihoods at risk. They also need role models of entrepreneurs as change agents in society, demystifying entrepreneurship for policy, civic administration and education. They need to feel and understand the overall cultural barriers to enterprise and work towards creating higher levels of aspiration.

34 http://www.technologystudent.com/designpro/richpic1.htm
35 See for example www.cfel.jbs.cam.ac.uk/resources and http://ecorner.stanford.edu

It is critical that the supply side also understands the often-conflicting rules that apply in their countries and institutions, because inadvertently they "criminalize" entrepreneurs who find it impossible to comply with one set of rules while obeying another conflicting set of rules. And more widely some countries have rules that simply do not allow people to operate in the formal economy.

Bearing in mind these weaknesses in the supply side we are left with the question how do we build an enterprise friendly ecosystem?

At a high level, it can be argued that the trainers and others among the stakeholders need to be from within the community. As they are more likely to have access to formal institutions they might provide some help through the use of technology, creating a single large community that can share insights, materials and support each other.

A more detailed view is provided in the table below of the what, where and how we might strengthen the supply side of entrepreneurship education. This Table provides a glimpse of the complex landscape that needs developing.

Table 9	Entrepreneurship Education for the Supply Side		
TARGET GROUP	**WHAT TO TEACH**	**WHERE TO TEACH**	**HOW TO TEACH**
Policy-makers	How to implement free market rules	Think tanks, Universities	High level discussions, cases
Administrators in Government and other Institutions	Administering relevant rules of fair trade, liberal HR policies. Being empathetic to entrepreneurship	Training Centres, Conferences, Universities	Work on specifics, writing documents to lobby Policy-makers
Teachers in Schools	Curriculum design. Helping to create social networks with entrepreneurs	In schools	Workshops run by entrepreneurs, videos, cases, simulations
University Academics	Curriculum, regulatory reforms, relevant research	Conferences	Papers, books, discussions, cases, entrepreneur interactions
Bankers	Risk appraisals, understand the world life of the entrepreneur. Finding ways to make things happen	Conferences Bank training centres Universities	Cases Facilitated interactions with entrepreneurs (target groups)
Business Development Agencies	Entrepreneurial/business processes Marketing Team Building Building Business	In situ In classrooms	Learn by doing Mentored Reflections
NGOs and other Social Enterprises	All of the above!	Close to locations and target groups	Cases, action learning, reflections

Neighbouring domains of knowledge

While we build on these platforms, we also need to recognize other domains of knowledge that influence our work. These are the work of Polanyi (Prusak, 1997) on tacit knowledge, and Nahapiet and Ghoshal on social capital (Myint, Vyakarnam, New, 2005).

Both of these are hugely influential in the practice of enterprise. Polanyi's work leads us to recognize that in entrepreneurship the educator cannot have all the answers to all the questions. Much of the information about opportunities, threats, resources and so forth lie outside the classroom with networks of people. To access these networks, an individual needs to build on his or her social capital. We can transfer explicit knowledge more easily in formal education but tacit knowledge passes through a form of osmosis and informal learning. These are important theoretical frames of reference in designing entrepreneurship education.

If we are to stimulate intent we also need to provide an ecosystem in which people can go forward by meeting potential team members, investors, suppliers, customers and others, through whom opportunities can be found and developed. We describe it as building an ecosystem of opportunity. It requires careful design and orchestration, because as educators we have to go beyond the creation of content and delivery and also find ways of ensuring we are taking an ethical stance. After all we are stimulating higher levels of aspiration and not everyone will be able to achieve their dreams.

Bringing it all together

The following examples of entrepreneurship education illustrate the approaches described above. The examples also attempt to show the diverse ways in which entrepreneurship education takes place drawing some conclusions about the gaps that need filling.

From the UK

- The National Council for Graduate Entrepreneurship (NCGE) aims its programmes at high education. The NCGE has created a framework for itself and is gradually rolling this out through the UK. At a high level the essence of the

pedagogy is to take the entrepreneurial life journey (developing the entrepreneurial mindset – also part of the agenda within the EU) as the basis of its framework, especially in the training of trainers programme. At the more practical level the NCGE also runs a number of projects, courses (Flyingstart and others) and conferences. It also provides a platform for the dissemination of research and commissions and co-authors reports.

- Enterprise Insight is a national campaign organization that seeks to illuminate the opportunities of enterprise in schools across secondary and further education. It runs an annual campaign and this has now gone "global" with an Enterprise Week, usually each autumn.
- Enterprise Educators UK is a membership driven organization that runs training of trainer events, shares knowledge and insights across peers and co-organizes an annual conference with NCGE. The key to this organization is that it is bottom-up and funded by members to share and develop enterprise education in the UK.
- The Centre for Entrepreneurial Learning at the University of Cambridge is an example of entrepreneurship education at universities. It is practitioner lead and blends theory with practice. It has created a portfolio of courses to meet a variety of learning needs within entrepreneurship education. The Centre is largely funded by the UK Government's Higher Education Innovation Fund.

Global Projects

- JA Worldwide (Young Enterprise/Junior Achievement) is a global network with a broad spectrum of activities in 123 countries, reaching out to over 9 million students across all ages (primary, secondary and tertiary education). It is popular because it is practice and mentor based in its delivery.
- The National Foundation for Teaching Entrepreneurship (NFTE) works in 14 countries, focusing exclusively on youth from low-income communities. NFTE has pioneered project-based, experiential learning and works especially closely with entrepreneurship teachers to deliver its programmes.

- Students in Free Enterprise work in many countries and encourage students from higher education to take up social enterprise projects.
- The ILO has developed extensive resources for trainers to use in business and entrepreneurship courses.[36] A primary example is the Expand Your Business programme.

European Projects
- Perhaps one of the better known projects in the field has been that of the European Foundation for Entrepreneurship Research. Through the sponsorship of serial entrepreneur, Bert Twaalfhoven, over 200 academics from around Europe have received training in business and entrepreneurship teaching using the case method from Harvard Business School. This network is now growing to include a more European focus and provides an excellent critical mass of educators.[37]
- JA-YE Europe (Junior Achievement/Young Enterprise) reaches 2.9 million students in 39 countries.

From the US
- The Kauffman Foundation engages in a wide range of activities across the US at the elementary, high school and university levels.
- The US has a framework of regulations and institutions that enable and foster entrepreneurship. For example the Small Business Administration helps small firms, the public sector (especially defence) has facilities to buy from small firms and there is much more venture capital available for more ambitious businesses.
- At the low income end of the spectrum much is achieved through urban regeneration work.[38] For example, in devastated coal mining, ship building and former industrial environments, new projects of regeneration are commenced to provide hope and opportunity to the urban people disadvantaged by loss of jobs and income. In addition to the examples from US such as the work of NFTE (supported by the Kauffman Foundation) there are many such programmes around the world.
- Junior Achievement reaches 4.5 million young people in 139 cities across the US.

From India
- Over several decades, the Entrepreneurship Development Institute of India in Ahmedabad has developed a strong suite of programmes, based largely on personal development (mindset, confidence, skill and abilities) and curriculum for business start-up and growth in several contexts.
- The Wadhwani Foundation has started to develop projects around more ambitious Web-savvy entrepreneurs and institutions (see http://www.nenonline.org).
- Social enterprise is strong in India with many individuals, formal institutions, corporations and not-for-profit organizations engaged in formal and informal forms of enterprise education. For example, Aviva Ltd, an insurance company, is building on the "bottom of the pyramid" principle and is providing marketing training for insurance products. This provides informal education in business and sales skills that are transferable. Larsen & Toubro Ltd provides training in building construction trades enabling young people to earn a living and later to diversify into self-employed construction workers. Computer literacy is provided to enable people to run Rural information Centres, microfinance and training in dairy farming and other forms of training for self employment. While the list is huge, there continues to be a major challenge in India – with the size of population.
- Junior Achievement India started operations two years ago and has ambitious goals to reach millions of young people.

From China
- Started in 1993, Junior Achievement China is now reaching 332,000 students. Appealing to the burgeoning private sector for support as well as reaching out to foundations and other agencies, it is building a national infrastructure to drive scale. The focuses of its efforts have been in Beijing, Shanghai and Guangzhou.
- Bright China Foundation is another example of education and support for youth (and featured in a case study in the youth entrepreneurship chapter of this report).

36 http://www.ilo-eyb-africa.org/training_materials.html
37 The author of this chapter of the report worked with Prof Malcolm Harper between 1986 and 1996 on enterprise education for NGOs, microfinance institutions and others, and on training of trainers at Cranfield University, within what was then the Enterprise Development Centre. In all we developed an alumni of 3,000 people from poorer countries trained in the content and method of enterprise education.
38 http://www.lehigh.edu/~taw4/corps.html

There is an increasing level of entrepreneurship education in the higher education sector of China, but it has been difficult to find reliable evidence of examples for social inclusion, a gap that needs to be filled in future studies and reports.

From the Middle East

- INJAZ (Junior Achievement/Young Enterprise) operates in 12 countries with 109,000 students. This is a clear indication of growth. Much has been done over the years in a patchwork of programmes for social inclusion. These have included efforts in Islamic banking, rural enterprise, and tackling graduate underemployment, especially in densely populated countries like Egypt.

From Africa

One of the many examples from African is provided here[39] as a way of highlighting a fairly typical programme. The example is taken from Botswana (Swartland, 2008),[40] and provides an illustration of the challenges and benefits. In the programme, loan officers act as trainers and advisers. This is an attempt to reduce the costs of running parallel services. The programme seeks to go beyond information services to:

- Enable their clients to see new possibilities in their context and what they know
- Motivate clients to find solutions and get involved in local community issues
- Engage in family planning
- Share resources
- Raise health awareness and immunizations
- Help with managing the relationship with the banks, bureaucracy and access other services

These extra services seem to require a 6 % cross-subsidy from microfinance to education and therefore thought to be highly manageable.

However, the education programmes that sit behind these high level objectives are out of synch. Much of what is delivered appears to be restricted to:

- Skills for vocational activity.
- Very basic business knowledge, such as accounting, bookkeeping and other such drab subjects.
- Teaching is provided by individuals who may not have had experience of starting and running a business.
- The curriculum is restricted to the establishment of business and does not seem to include anything in the area of social enterprise, and so on.

What appears to be missing are many of the activities performed by entrepreneurs:

- Networking – getting to know people who can help
- Resource investigation
- Finding new ideas
- Being competitive with ideas, markets and products
- Selling skills
- Avoiding imitation
- Wider social skills
- Managing cash and money (although this may well be part of the book-keeping teaching)
- Building small teams of people – employing others
- Growing from informal to formal business and so forth

Highlighting the single case above is not meant to be critical of the case, but simply to highlight the potential disconnect between what policy-makers have considered through careful research and what eventually gets delivered. In other words, we need to gain a better understanding of what is required in entrepreneurship education that can achieve the results expected from the high-level policy frameworks.

Hereunder, some additional examples of entrepreneurship education for social inclusion from Asia, Africa and Latin America.

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39 There is a huge amount of work done in Africa by multilateral agencies, national agencies of rich countries, NGOs and consultants working for national Governments
40 This author together with Professor Malcolm Harper ran a number of courses in enterprise promotion and development for about 10 years: Developing Income Generating Enterprise – at Cranfield University; Small Enterprise Promotion Programme – with Kenya Institute of Management in Nairobi; in addition they co-authored books on rural enterprise; the author also facilitated a workshop on enterprise development for the FAO

Table 10a					
TITLE	**LINK**	**COMMENTS**	**SOURCE**	**GEOGRAPHY**	**TOPIC**
Beyond Primary Education: Challenges and Approaches to Expanding Learning Opportunities in Africa	http://www.adeanet.org/Biennale%20f or%20presentation/06.%20Session%206/Parallel%20session%206C/F inal%20PDF%20documents/Session%206C%20Doc%202%20Botswa na%20ENG.pdf	Discussion on entrepreneurship education in institutions in Botswana	ADEA	Africa	Non-formal education (NFE)
Moving beyond the Classroom: Expanding learning opportunities for marginalized populations in Tanzania	http://www.adeanet.org:8080/adeaPortal/action/telechargerDocument? method=telechargerDocument&urlDoc=%2Fussr%2Fapache-tomcat%2Fwebapps%2FadeaPortal%2FBASE+DE+DONNEE%2FProfil e1-1998-2004%2FFiles%2Fen%2Fe03a321.pdf	Discusses learning opportunities for displaced populations in Tanzania	ADEA	Africa	Non-formal education (NFE)
Friedrich Ebert Foundation – Report from a working group on Entrepreneurship development and training in Africa	http://library.fes.de/fulltext/bueros/botswana/00553001.htm	Discusses the need for entrepreneur-ship education and training and how chambers of commerce can support SMEs/entrepreneurs	Friedrich Ebert Foundation	Africa	Entrepreneur-ship education
Friedrich Ebert Foundation – Report from a working group on Entrepreneurship development and training in Africa	http://library.fes.de/fulltext/bueros/botswana/00553002.htm	Describes the experience of Botswana in how chambers of commerce can support SMEs and the entrepreneurs running them	Friedrich Ebert Foundation	Africa	Entrepreneur-ship education
Friedrich Ebert Foundation – Report from a working group on Entrepreneurship development and training in Africa	http://library.fes.de/fulltext/bueros/botswana/00553003.htm	Describes the experience of Mauritius in how chambers of commerce can support SMEs and the entrepreneurs running them	Friedrich Ebert Foundation	Africa	Entrepreneur-ship education
Friedrich Ebert Foundation – Report from a working group on Entrepreneurship development and training in Africa	http://library.fes.de/fulltext/bueros/botswana/00553004.htm	Discusses the need for entrepreneur-ship education and training and how chambers of commerce can support SMEs/entrepreneurs running them	Friedrich Ebert Foundation	Africa	Entrepreneur-ship education
Entrepreneurship education in South Africa: a nationwide survey	http://www.creativity.ir/images/stories/PDF/EntrepreneurhipEdu cationinsouthAfrica.pdf	This paper aims to assess the state of development of entrepreneurship education, determine the importance of entrepreneurship in the South African higher education institutions (HEIs), and offer recommendations for improving preparations for the developing field.	Jesselyn, M, Mitchell, B. "Entrepreneurship Education in South Africa". University of Surrey, http://www.creativity.ir/images/ stories/PDF/Entrepreneurship Educationinsouth Africa.pdf, 2005 Education + Training, 2006, 48-5; 348-359	Africa	Entrepreneurship education
Education in India	http://sramanamitra.com/2007/03/09/the-education-problem-raj-reddy-part-1/	Rural development in India (Look at segment 14)	www.SramanaMitra.com	South Asia	Non-formal education (NFE)
Mann Deshi: A Micro-Business School for rural women	http://www.evancarmichael.com/African-Accounts/1680/Mann-Deshi-A-MicroBusiness-School-for-rural-women.html	Article highlighting a microbusiness school in India	Development Gateway Foundation	South Asia	Skills for small business

TITLE	LINK	COMMENTS	SOURCE	GEOGRAPHY	TOPIC
UNCTAD – Information economy report	http://www.unctad.org/en/docs/sdteecb20071_en.pdf	Discusses, among other things, two examples of adoption of ICT by microbusinesses in Africa and India	UNCTAD	Global	Skills for small business
Entrepreneurship Education as a catalyst of development in the third world	http://books.google.co.uk/books?hl=en&lr=&id=Fh3hljcniid4C&oi=fnd&pg=PA56&dq=entrepreneurship+development+&ots=jlUNPhVlI1&sig=Upoe0zeqAuoG2MiNtd8iCS-S5ndY#PPA56,M1	Author J.B. Singh, focuses on the returns gained by developing countries by investing in education.	Journal of Small Business & Entrepreneur-ship. 1990, 7:56-63	Global	Entrepreneur-ship education
Management Skills for small business	http://www.ic.gc.ca/epic/site/sbrp-rppe.nsf/vwapj/mmgtskils_e.pdf/$FILE/mmgtskils_e.pdf	Focuses on issues related to management skills for small business in Canada	Industry Canada	North America	Skills for small business
Choosing an entrepreneurial development system: the concept and the challenges	http://www.emporia.edu/business/cbedPDF/Choosing%20an%20Entrepreneurial%20Development%20System.ppt	This paper presents a discussion on the process of choosing an entrepreneurial development system for a local rural community and region. Background information is provided from which the selection of a number of programme elements available from the literature was made in developing the proposed system. Challenges of implementing the proposed system are presented	Smith, W. "Choosing an Entrepreneurial Development System: The Concept and the Challenges", Emporia State University, http://www.emporia.edu/business/cbedPDF/Choosing%20an%20Entrepreneurial%20Development%20System.ppt International Journal of Management and Enterprise Development Issue, 2005, 2- 3-4	North America	Entrepreneur-ship education
FSB Training and qualifications policy	http://www.fsb.org.uk/policy/images/Qualificatons.pdf	Current policy of FSB towards training and qualifications - provides the context towards its approach and its work with EDGE, the educational charity	Federation of Small Businesses	UK	Skills for small business
Developing the business and developing people	http://www.fsb.org.uk/policy/assets/FSB SFEDI report.pdf	Presents results from a survey on learning and development in small business	Federation of Small Businesses	UK	Skills for small business
Management development and learning in microbusinesses	http://www.berr.gov.uk/files/file38306.pdf	Presents a conceptual model drawing attention to the nature of management development	Dept. of Business, Enterprise &Regulatory Reform	UK	Skills for small business

3.4 Key Indicators of Success

The Table below provides a broad matching scheme for measuring success with entrepreneurship education. The Table is based on the earlier one on target groups and proposed inputs. With this Table we therefore consider what measures would be relevant to the educational input for each of the target groups.

Table 11 Key Success Factors Entrepreneurship Education for Social Inclusion				
TARGET GROUP - Educational Attainment	**Awareness of Entrepreneurship and its impact on economy** Numbers of participants and in the longer term an improved climate for enterprise. Similar to advertising and brand awareness studies opinion polls.	**Social Skills to become entrepreneurs** Use of before and after measures of specified entrepreneurial skills.	**Basic Business Skills to run own small business** Create a check list of desired learning outcomes and measure against these. At this level, might include numeracy. Maintain a register of participants and carry out annual surveys to see how many have converted to actual business starts.	**Advanced business skills to grow business** Number of businesses started, certification. Maintain a register and carry out annual surveys to see how many have grown.
Illiterate, Unemployed	✓	✓	✓	
Semi-literate and Underemployed	✓	✓	✓	✓
Secondary Education	✓	✓	✓	✓
Higher Education	✓	✓		✓
Society at Large	✓			

3.5 Case Studies

AMUL – A case of progress in social inclusion

The Anand Milk Union Limited (AMUL) began in 1946 with a group of farmers who were keen to free themselves of intermediaries and gain more direct access to markets thus ensuring more of the profits coming to them.

Based in the village of Anand, AMUL expanded exponentially. It joined hands with other milk cooperatives and the network now covers 2.12 million farmers, 10,411 village level milk collection centres and fourteen district level plants (unions) under the overall supervision of the Gujarat Cooperative Milk Marketing Federation (GCMMF). There are similar federations in other states. Right from the beginning, there was recognition that this initiative would directly benefit and transform small farmers and contribute to the development of society.

Indian markets, then and even today, are primitive and poor in infrastructure. AMUL and GCMMF acknowledged that development and growth could not be left to market forces and that proactive intervention was required. Two key requirements were identified. First, sustained growth for the long term would depend on matching supply and demand requiring heavy investment in the simultaneous development of suppliers and consumers. Second, effective management of the network and commercial viability would require professional managers and technocrats.

AMUL products are available in over 500,000 retail outlets across India through its network of over 3,500 distributors. There are 47 depots with dry and cold warehouses to buffer inventory of the entire range of products. The network follows an umbrella branding strategy. Amul is the common brand for most product categories produced by various unions: liquid milk, milk powders, butter, ghee, cheese, cocoa products, sweets, ice-cream and condensed milk. Amul's sub-brands include variants such as Amulspray, Amulspree, Amulya and Nutramul. The edible oil products are grouped around Dhara and Lokdhara, mineral water is sold under the Jal Dhara brand while fruit drinks bear the Safal name. By insisting on an umbrella brand, GCMMF not only skilfully avoided inter-union conflicts but also created an opportunity for the union members to cooperate in developing products.

Even though the cooperative was formed to bring together farmers, it was recognised that professional managers and technocrats would be required to manage the network effectively and make it commercially viable. AMUL is therefore an interesting case of where professional management is mixed in with semi-literate farmers and their families in connecting rural India with its markets. The impact of diversifications, product innovations and other marketing decisions have an impact on rural entrepreneurship and through this influence people learn new skills and knowledge.

GEN Initiative

In April 2007, GEN Initiative started female literacy projects in India to teach young women to read and do simple arithmetic. It also enables young women to take up sewing and start to sell small items and take tailoring orders. Another project run locally is that of "Shakti" traders. Women resell Unilever products in small units at extremely affordable prices (soap bars for examples). Both these projects have resulted in the teaching of basic entrepreneurial skills. The main outcome though is increased levels of income.

Fair Trade

There has been a rapid growth of fair trade organizations,[41] with visions similar to those of farmers' cooperatives all over the world. The basic objective is to bring more of the profits back into the supply chain. This movement has now become much more sophisticated and wide ranging with product lines in commodities, foods, textiles, handicrafts, manufactured products, horticulture, and plantation crops. This important business model attempts to enable those at the base of the pyramid to benefit from the enterprises more than they otherwise would under pure free market economics, where those with the power and influence in the supply chain exercise power over pricing.

The benefits of this approach are that people learn about how to participate in modern supply chains, are treated fairly and in turn might be expected to transmit those values and methods into their other interactions.

41 http://www.fairtrade.org.uk/producers/default.aspx

3.6 Recommendations

Policy-makers

Governments need to commit to long-term, sustained (5-10 years) funding for this agenda. This is because short-term funding cycles create instability in programmes (Vyakarnam, Adams, 2001). This is an important agenda, similar to the provision of health services and broader education. It can lead to people who are better equipped to participate in the economy.

Governments need to review legislation that holds back entrepreneurship and ease regulatory frameworks to encourage responsible forms of entrepreneurship. In many countries the legislation (red tape) is so cumbersome that entrepreneurs prefer to operate in the informal sector and so they remain outside the scope of effective assistance, outside formal banking support and suffer many other disadvantages.

There seems to be much lip service at senior levels of policy-making where claims are made in support of the need for an enterprise culture, but there is great reluctance to loosen up legislation and to provide resources, clear frameworks and policies that can empower people into enterprise.

Corporations and other stakeholders

Stakeholders, such as not-for-profit organisations, large local and multinational companies, well-established entrepreneurs and others need to come together in networks to create an ecosystem in which entrepreneurship can flourish. For example, stakeholders could set aside a number of days for staff to participate as "educators"; provide short duration internships; buy locally; open up spare places on training events for owners of small businesses to participate; encourage governments to develop a portfolio approach; engage with celebration events such as Global Entrepreneurship Week; participate in business creation/plan competitions as sponsors and judges and whatever else is appropriate locally.

Although there are good examples of such activity, it is a matter of scaling up the provision. However, there are many parts of the world where this does not happen at all and the emphasis of this recommendation is a call to action in such environments.

Entrepreneurship education is very practice based and needs to be part of an ecosystem in which society and institutions are engaged, supportive and where the culture is "pro-enterprise."

Multilateral organizations

Organizations such as the UN ought to create Web-based resources, knowledge-sharing platforms and networks of educators.

The world is full of teaching materials. Apart from maintaining a stream of new case studies, a major project needs to be initiated to create a sharing mechanism in the major languages. At present, finding materials that are relevant to particular sessions or contexts is quite hard for educators and so they have to rely on whatever was done most recently or even make the session somewhat anecdotal. Conversely there is also a "franchise" mentality among educators, simply licensing or copying courses from other countries without thinking about what is the most relevant. There are many educator networks, but it would be interesting to create a meta-network, to bring about a critical mass of thinkers in the field.

Materials need to be aggregated from global sources and institutions around the world should be encouraged to share information digitally on a technology platform that could be developed for example in the spirit of a "wiki."[42]

Educators and Trainers

Governments and stakeholders need to provide resources (sponsorship) for access to world-class journals and publications so that educators and trainers can be encouraged to read what is cutting edge and current. Many of these journals and publications are simply not available to educators and trainers in poor countries and so they risk being stuck with old materials, ideas and methods.

42 See for example http://www.fairtrade.org.uk/producers/default.aspx or www.entrepedia.org.

Educators, trainers and institutions should adapt their curricula, to ensure that it is relevant, cutting edge, fresh and dynamic. It is time to go beyond the "teaching of business plans" or rather simple business know-how to include much more on practical skills, personal development and confidence building. Educators and trainers also need to be embedded in the context and provide access to resources, markets and opportunities, not just "training."

The credibility of the delivery institution and its staff needs enhancement. Educators and trainers in this field must find increasing ways of engaging more experienced entrepreneurs from within their own communities to "teach" and to "mentor" nascent and novice entrepreneurs. These individuals have the greatest credibility and when combined with a relevant curriculum the model can be most effective.

Educators and trainers need to strike a balance between formal and informal approaches. Because the formal education system treats entrepreneurship education as an extension to strategy/business studies much content is lost. The lack of integration of practitioner inputs and, networking means that informal learning is often overlooked.

Programmes and courses need to be made worthwhile for participants. Many entrepreneurship courses suffer from a steep decline in attendance after the early sessions because the timing of such a course in the life of the participant is inappropriate, the course itself is not well run (administratively), or the content and style is not appealing and sometimes boring. A far greater level of training is required for trainers and educators to make sure that effort is well directed.

Societal changes

Policy-makers, educators, entrepreneurs and sponsors need to come together in conferences on a sufficiently large scale to work together to raise standards, increase the volumes of participation and find appropriate local, regional and national solutions so that entrepreneurship education can have a positive impact at the grass roots. This is a key strategy to move us from the heroic model of entrepreneurship education to a more democratic and culturally sensitive approach. It is a model that ensures sharing and collaboration and ultimately is more sustainable.

Television must not be ignored. Although not universal, TV has a major reach across society and can be influential in transmitting ideas and raising aspirations.[43] This can either be run in a public service spirit or on more commercial bases. Senior figures from TV companies and production businesses should be engaged in scoping out how best to help and in determining the nature of programming that might work over all cultures and formats. Perhaps a Discovery Channel or similarly serious content provider can be invited to contribute to discussions on this topic.

Finally, the big message is that the vast majority of the working people in the world are self-employed or work in small organizations, but as yet their income levels are not sufficient to lift people above grinding poverty and hit the targets set under Millennium Development Goals. While economic and political reforms play an important role in setting the scene, people need the knowledge, skills and mindset to take advantage of opportunities. It is hoped that this contribution can help make a difference in this arena.

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43 If the TV viewing figures are to be relied on – it would appear that the Athens Olympics were watched by some 3.9 billion people in 2004 – giving us an approx indicator of the level of TV penetration globally.

Steering Board Case Studies

KAREN E. WILSON,
GV Partners

Lessons Learned from GEI Steering Board Case Studies

As part of this project, a series of interviews was conducted with several companies serving on the Steering Board of the World Economic Forum Global Education Initiative to learn about their programmes and experiences in entrepreneurship education. The organizations interviewed included AMD, Cisco, Intel, Microsoft and the Goldman Sachs Foundation.

These organizations have launched a range of activities including organizing conferences/ forums, initiating business plan competitions, developing training courses – for both entrepreneurs and faculty, creating accelerator programmes and labs and developing course materials using online tools such as videos and games.

While each company has taken various approaches to addressing entrepreneurship education, there are a number of **common elements**:

- Focusing on raising awareness, changing mindsets, developing both hard and soft skills
- Connecting business, technology and other disciplines
- Using technology as an enabler for delivering entrepreneurship education
- Building cross-border linkages

At the same time, there are many **common challenges** that were identified through the case studies:

- Changing mindsets is a long-term goal; it is difficult to "move the needle."
- Entrepreneurial attitudes vary across regions/cultures.
- Need to localize content to fit the local context.
- Challenge of building serious student interest in launching high growth/tech companies (depending on the region/culture).
- Necessity of building the proper internal and external systems or infrastructure to implement the programmes.
- Need effective short-, medium- and long-term measures of programme outcomes.
- Making sure the programmes are sustainable.

There were also a number of **common lessons learned** including:

- The need to address the ecosystem/all parts of the value chain
  This cannot be done in isolated manner – have to partner with others.
- The importance of multistakeholder partnerships
  - Local, regional and national governments
  - Other companies
  - NGOs
  - Schools, universities, training centres
  - Student and entrepreneur organizations
- Need for critical mass
  - More than one-off initiatives
  - Need to scale/link programmes
- Importance of getting out there, getting feedback and then modifying approach
  - In essence, being entrepreneurs
- Activities are more powerful if they leverage the core competencies and human capital/people of firms

We congratulate these companies, as well as the other GEI Steering Board members, for their significant investment in entrepreneurship education as well as their leadership in spearheading the World Economic Forum initiative in this area.

Table 12 **Steering Board Case Studies**							
Activities / Company	Forums / Events	Training / Mentoring Students & Entrepreneurs	Training Faculty	Business Plan Competition / Awards	Accelerator / Incubator Programs	Centres or Labs (Physical / Virtual)	Curriculum Content	Online Education Tools
AMD							✓	✓
CISCO		✓	✓	✓	✓	✓	✓	✓
INTEL			✓	✓			✓	
MICROSOFT	✓	✓		✓	✓	✓	✓	
GOLDMAN SACHS	✓	✓	✓	✓			✓	✓

4.1 AMD

AMD Interviewees

Allyson Peerman, Vice-President, Public Affairs and President, AMD Foundation

Anne Fertitta, Marketing Communications Manager, 50x15 Initiative

Background

AMD is built upon the value of putting people first – our customers, our employees, our neighbours and our communities around the world. We believe that the success of our company is directly related to the health of the communities we call home. As a result, we have a long-standing heritage of investing our core assets of time, money, technology and volunteer expertise in local organizations to help solve some of society's toughest challenges.

As an extension of this legacy, AMD recently created the AMD Foundation to bolster the company's philanthropic giving and provide sharper focus for its more than 25-year history of investing in our communities. The mission of the AMD Foundation is to connect and empower individuals with knowledge, thereby opening doors to opportunity. Education is AMD's primary charitable focus area because it serves as a great equalizer and sustains each community's long-term quality of life.

Key Programmes

AMD Changing the Game

AMD Changing the Game builds upon AMD's longstanding philanthropic heritage and the efforts of employees globally in support of education initiatives around the world.

AMD Changing the Game is designed to help youth at the middle and high school levels harness the power of digital games with social content while learning critical education and life skills. Through the process of developing and playing their own issue-themed games, AMD Changing the Game participants develop essential skills in science, technology, engineering, and math, also known as STEM skills. At the same time, students explore critical thinking, problem solving, project leadership, and contemporary themes of social responsibility. Attention to these developmental areas will, in turn, help participants expand their future educational and professional opportunities as citizens of the 21st Century.

AMD believes that digital games are evolving and educators are only just beginning to understand their value as educational tools. For today's young people to realize their full potential, their 21st Century skill set must include unique proficiencies that will prepare them for the challenges of higher education and career development. Their preparation should include:
• Core subjects of science, technology, engineering and math
• Learning skills including critical thinking and problem solving
• Life skills such as leadership and citizenship

AMD Changing the Game strives to support organizations that meet kids where they are—turning their innate passion for gaming into a renewed focus on learning. When youth conceive and develop their own socially conscious games, their learning potential can multiply significantly. This new breed of games can have a positive impact on the environmental and social issues that matter most to current and future generations—from climate change, to disaster relief, to causes for social justice. Through hands-on development of games with social content, our youth can be more aware, active, and empowered to seek change in the world.

Socially Responsible Gaming: A movement for the positive potential of games.

The Games for Change movement, advanced by groups such as the New York-based non-profit organization Games for Change, promotes the use of digital games to educate and engage people of all ages around pressing social issues. These games are designed to inspire players to get involved with problem solving based on real-world needs. These games can teach kids how to be more engaged citizens, enable them to see conflict from another person's viewpoint, and inspire them to find positive ways of responding to key issues of the day.

Examples of games with social content include:
• Ayiti: The Cost of Life
• Karma Tycoon
• PeaceMaker
• Planet Green Game
• Tempest in Crescent City

AMD is proud to advance the use of digital games to promote social issues through AMD Changing the Game, an initiative of the AMD Foundation. We believe that as gaming evolves, it will grow far beyond entertainment ? and into a powerful tool used to educate and help improve our world.

50x15 Initiative

50×15

www.50x15.com

50x15 was started as a global initiative, founded by AMD, with a goal to enable affordable Internet access and computing capabilities to 50% of the world's population by the year 2015. Launched in January 2004 at the World Economic Forum, 50x15 was designed from the beginning to be a partner-based, global initiative, drawing upon the

strengths and resources of diverse organizations working towards the common goal of connecting half the world's population to the transformational power of the Internet and computing capability.

Today, almost five years later, 50x15 has developed a remarkable ecosystem of global partners, including Microsoft, Sun, Cisco, the International Telecommunications Union, UNESCO, PEPFAR (The US President's Emergency Plea for AIDS Relief)and many others, and is now ready to take a transformational step in the initiative's evolution. Beginning in 2009, 50x15 will operate through the independent 501(c) non-profit, 50x15 Foundation.

Key Partnerships
Games for Change:
- Girlstart (Austin, TX)
- Global Kids (Brooklyn, NY)
- Institute for Urban Game Design (Washington, DC)
- Science Buddies (Carmel, CA)
- 5th Annual Games for Change Festival (New York, NY)
- PETLab, a joint project of Games for Change and Parsons The New School

50x15:
Hundreds of partners have been involved. Navigating the world's diverse digital and cultural landscape presents a challenge that requires many organizations—including local governments, NGOs, corporations, educational institutions, and thought leaders—working together to achieve a common goal. The 50x15 Partner Program facilitates end-to-end collaborative relationships that help accelerate the distribution of technology solutions, new products, and lessons learned to the markets and individuals that need them most.

To date, 50x15 partners have implemented dozens of Learning Labs around the world, from South America and Africa to Eastern Europe and Asia. And many more are planned, in places where the potential for economic growth can benefit from a populace ready and eager to embrace an entrée into global markets that only digital inclusion can bring.

Each initiative has a local group of companies, NGOs, governments and others involved, e.g., Microsoft, Cisco, Sun and various NGOs have been working together in Africa.

Funding

AMD Changing the Game makes grants to selected non-profits that provide opportunities for youth to develop social-issue games. The amounts range from US$ 25,000-100,000.

The 50x15 initiative has been fully integrated into all activities domestically and internationally, as well as in functional areas such as sales, marketing, and government affairs. Programme costs, as well as corporate and regional investments for 2007-2008, were approximately US$ 3.1 million.

Outcomes

AMD Games for Change:

The programme targets 13-18 year old students, helping youth learn by developing STEM skills as well as life skills, both of which are important for entrepreneurship. Students have the opportunity not only to play the games but to create them. The programme was launched in June 2008 at the Games for Change Festival in New York, so it is in the development phase. The initiative was intentionally designed to scale over time as more resources and partners become available globally.

In addition to providing grants to non-profit partner organizations, AMD is also working with PETLab, a joint project of Games for Change and Parsons The New School, to create a social issue game development curriculum for youth. The curriculum will be piloted in the Spring of 2009 and made available later in the year.

50x15:

At the Initiative's inception, only about 10 % of the world's population had access to the Internet. Today, the visibility and impact of 50x15 programmes have enabled millions more to access the Internet, and significantly helped foster long-term economic progress and investment within high-growth markets. By its own account, the Initiative has:

- Established more than 50 learning labs in 15 countries on five continents
- Connected more than 1,000,000 students in Africa to computers and the Internet—a number that continues to grow exponentially as the programme scales
- Expanded the global network of corporate, non-profit and government ecosystem partners to include more than 100 organizations, all united by a common goal
- Been recognized by the World Economic Forum as one of the leading global efforts to improve digital inclusion and increase computing and information technology access worldwide

Today, approximately 22 % of the world's six billion inhabitants now have access to the educational, social and economic opportunities available through the Internet. The 50x15 Initiative and its ecosystem of partners have played a key role in accelerating digital inclusion worldwide.

Key Success Factors

AMD Changing the Game:

Changing the Game inspires kids to learn by finding the right arena through which to engage the hearts and minds of today's youth. AMD Changing the Game can inspire kids to learn and teach collaborative skills as the students must agree upon and research the social issue they will explore for the games they develop. Further, introducing game development to kids at a young age may encourage

them to enter the gaming field or a similar technical area as a career. There is a recognized shortage of qualified game developers in many communities around the world.

50x15:

The 50x15 Partner Program seeks to build local digital inclusion ecosystems that consist of six key areas of services: power, financing, devices, content, expertise, and connectivity. By bringing together collaborators with expertise in these disciplines, the programme is designed to ensure that the vital resources offered by 50x15 partners and their solutions are utilized in a way that maximizes the chances for success.

Challenges/Barriers

We try to navigate the vast number of opportunities related to gaming and education. It is amazing to see the multitude of changes happening so quickly in this space. There is not nearly enough time or money to do all we would like, so we must constantly prioritize our efforts.

Lessons Learned/Recommendations for Others

For these programmes to be sustainable, they must have strong leadership within the organization (i.e. an "executive champion") and must drive business value. In the case of AMD Changing the Game, the program enhances STEM skills, thus helping to build the next generation workforce. It also supports the corporate brand and showcases AMD as a leading-edge graphics provider for gaming applications.

50X15 enables AMD to build strong market relationships with influencers around the globe and provides opportunities to expand market share in developing countries.

Future Plans

Having recently launched AMD Changing the Game, the program is still exploring a broad array of partners. There are many potential linkages with universities, high schools, non-profit organizations, customers, game developers and others interested in the social gaming movement. The plan is to have one full-time person dedicated to the program in 2009. While currently US-focused, the intent is to make

AMD Changing the Game a global program by finding potential partners in AMD site communities around the world. To learn more about AMD Changing the Game, visit www.amd.com/learn.

AMD's 50x15 Initiative is taking the next step in its designed evolution: transitioning from an AMD led effort to an externally supported, non-profit global coalition managed by the 50x15 Foundation. The 50x15 Foundation, created in 2005 in anticipation of this evolution, has already been a key factor in attracting partnership and engagement, offering the flexibility and autonomy necessary to leverage global resources critical to achieving the goals of 50x15. For 2009, the 50x15 Foundation will apply special focus to digital inclusion projects in Africa, a region where the economic, education and geographic conditions have constantly resulted in both impact and scale. To learn more about the 50x15 Foundation, visit www.50x15.org.

4.2 Cisco

Cisco Interviewees

Tara A. Collison, PhD, Senior Manager, Cisco Corporate Affairs

Bill Souders, Senior Director, Cisco Networking Academy, Corporate Affairs

Kevin Warner, Senior Director, Cisco Entrepreneur Institute

Donna Wright, PhD, Marketing Manager, Cisco Corporate Affairs

Background

Over the past 20 years, Cisco has used technology to advance its business and become one of the world's leading companies. Cisco's vision is to offer the lessons learned from its own experience, combine business-relevant knowledge from leading business and learning resources, and connect entrepreneurs with people, information, and the leadership of local organizations. The result will be strengthened business skills that help entrepreneurs grow, differentiate, and innovate—and dramatically improve their potential for success.

> *"I believe there are two great equalizers in life – education and the Internet. We cannot underestimate the impact that a level playing field has on education, the local economy, job creation, and a country's competitiveness. Education combined with technology creates that level playing field."*
>
> John T. Chambers, Chairman and CEO, Cisco

Key Programmes

Cisco has several programmes around the world that support entrepreneurship education in a variety of ways:

- Cisco Networking Academy
- Cisco NEPAD e-School Curriculum
- The Cisco Entrepreneur Institute
- Digital Opportunity Trust

Cisco Networking Academy

Cisco Networking Academy is an innovative education initiative that provides ICT education to students in more than 160 countries. Networking Academy has been preparing students from virtually every socioeconomic background and region to take advantage of ICT opportunities since 1997. This helps narrow the skills gap between countries and enables students in disadvantaged areas to compete more successfully in the global marketplace.

Networking Academy uses a global partnership network to accomplish the following:

- Extend first-rate technology education to underserved areas
- Empower people to realize their potential and achieve greater personal prosperity
- Stimulate the development of a global knowledge-based economy
- Encourage long-term, sustainable economic growth in communities and countries

Networking Academy is committed to helping students develop the skills needed to succeed in the ICT field. It integrates 21st century skills in the curricula such as problem solving, creativity, critical thinking, collaboration, communication, and negotiation to stimulate students' intellectual capacity and support the application of skills in a real world environment.

Key Partnerships

Networking Academy utilizes a partnership approach that leverages the expertise of many types of organizations, including educational institutions, governments and NGOs. Many academies also partner with local organizations to help strengthen the programme.

Networking Academy recently launched new programmes that directly support entrepreneurship. In India, Cisco has partnered with the Small Industries Development Bank of India (SIDBI) and Tiruchirappalli Regional Engineering College – Science and Technology Entrepreneurs Park (TREC-STEP) to provide loans, mentoring and training to ICT entrepreneurs in Tamil Nadu state. These entrepreneurs have completed

Networking Academy courses. TREC-STEP will evaluate programme participants' capabilities and provide appropriate training and guidance. SIDBI has developed a special LaunchPad loan for this project.

In Bangladesh, Cisco has partnered with the Grameen Group to bring business services to rural Bangladesh. The business centres will be run by rural entrepreneurs who will receive training and guidance from Grameen. Grameen will also facilitate information exchanges between business centre operators.

Funding/Resources

Networking Academy is an excellent example of an effective, sustainable partnership between the public and private sectors. Together they accomplish more than either could do alone.

- Educational institutions provide teaching expertise, students, facilities, and a local relevance.
- Governments provide an understanding of the local community, culture, and resources.
- NGOs provide a nonbiased approach to education, as well as strategies for sustainability.
- Private sector companies and local communities provide technology equipment/solutions, labs, and business/operational expertise.
- Cisco provides a blend of business acumen and IT expertise, a commitment to education as a global equalizer, and a culture of giving back.

Outcomes

Networking Academy delivered ICT skill training to more than 700,000 students in more than 160 countries in 2008. Cisco endeavours to understand how student use their skills after they leave Networking Academy. Many students report that their Networking Academy experience resulted in positive career outcomes, going on to pursue additional ICT education and even starting their own businesses.

" I'm a very hands-on learner, so the interactive activities helped me to practice what I was reading and provided explanations when I was doing something wrong. The structure of the course, the visual layout, and the navigation made it easy and fun to learn about building networks and to understand how everything works together. CCNA Discovery was very helpful in building my small business – it not only gave me the networking knowledge I needed, but also the communication and troubleshooting skills I use on a daily basis."

Zach Thomas,
entrepreneur and a former CCNA Discovery student at the
Applied Technology Center in Rock Hill, South Carolina

Key Success Factors

- **Curriculum:** Cisco has leveraged a comprehensive understanding of networking technical skills along with the 21st century skills necessary for success in the global economy to create state of the art course content. In addition, all of the courses are designed with a strong focus on the application of skills in a real world environment. For example, in one course, students are guided through a real world example of designing a network for a sports stadium. The approach requires students to respond as they would if they were running an ICT business, from gathering customer requirements to development of requests for proposals (RFPs) to estimating timelines and resource needs.
- **Partnerships:** Networking Academy partners help ensure that the programme is implemented in a locally relevant way, help improve the quality and accessibility of the Networking Academy curricula, encourage workforce development, and help students succeed during and after their studies.

Challenges/Barriers

Starting a business requires obtaining capital that students may not easily have access to. This is why Cisco is now investing in ICT Entrepreneur Projects such as those in India and Bangladesh.

Future Plans

Networking Academy will continue to invest in building entry level networking skills in a way that continues to increase awareness of how ICT skills can help solve business problems, and thereby enhance creativity in ideas around creating new businesses to solve new and emerging business problems.
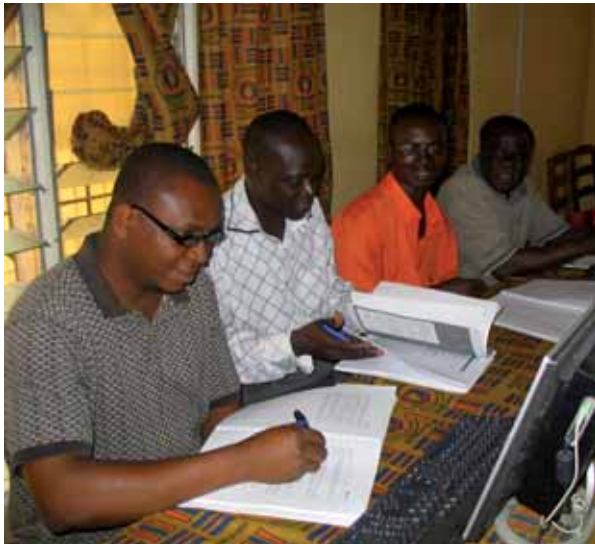
Cisco NEPAD e-School Consortium

The New Partnership for African Development (NEPAD) was established in 2001 to address challenges facing the African continent and set forth a new vision for Africa's growth and renewal. In the area of education, the NEPAD e-Schools Initiative was developed to help reduce the digital divide by improving the quality of primary and secondary education. The primary objectives of the NEPAD e-Schools Initiative are as follows:

- Deliver ICT skills and knowledge to primary and secondary school students for improved access to opportunities in the global information society.
- Make every learner health literate.
- Enable teachers to use ICT tools to enhance teaching and learning.
- Provide ICT skills training to administrators to facilitate the efficient management of school.

Key Partnerships

Five companies are leading consortiums within the NEPAD e-Schools Initiative: Cisco, Microsoft, HP, AMD, and Oracle. Cisco's consortium of 25 partners from the public and private sectors focused on integrating ICT into educational processes to improve student outcomes. The consortium ran for three years, wrapping up its work in December 2008.

Funding

Each consortium leader made significant investments.

Outcomes

The initiative helped demonstrate what it takes to deliver ICT in education. The Cisco consortium focused on six countries: South Africa, Rwanda, Mauritius, Senegal, Ghana, and Algeria. During the three years of the initiative, thousands of students and hundreds of teachers were reached. The results were documented and have been made available externally. In addition, guidelines were developed for governments to consider for planning and implementation.

Key Success Factors

- Teacher training is critical and one-third of the total investment was focused in this area. Enlightened and motivated teachers have the greatest impact and are able to reach more students.
- Ownership by national, regional and local governments is important.

Challenges/Barriers

The pilot initiative was set up to test across countries and schools. It might have been better to focus the pilot more tightly within a region to minimize costs and maximize impact.

Lessons Learned/Recommendations

- Teacher training requires significant investment. It is a long, "high touch", and expensive process, but critical to the overall success of the programme.
- Public-private partnerships requirement strong commitment and ownership on both sides. NGOs and development agencies should be engaged early on since they play important roles in providing expertise and filling gaps.

Future Plans

Following the pilot, Cisco provided seed funding for a new entrepreneur training programme in South Africa in partnership with Dabba Communications, with plans to scale the programme through a partnership with Inveneo. The programme will focus on wireless ISP opportunities and associated small businesses.

" At Cisco we realize that the success of an economy depends to a large extent on the success of local entrepreneurs. Today's entrepreneur must be equipped with 21st century skills, including collaboration, communication and critical thinking, as well as technological literacy to effectively compete and thrive in an increasingly interconnected world."

Tae Yoo, Senior Vice-President,
Corporate Affairs, Cisco

Cisco Entrepreneur Institute

<u>The Cisco Entrepreneur Institute</u>

The Cisco Entrepreneur Institute is a collaborative effort between Cisco, top business schools, local governments, and business organizations. Through the Institute, Cisco is fostering innovation, growth, and prosperity by working with recognized business leaders and sharing best practices to help entrepreneurs thrive both locally and globally. The Entrepreneur Institute helps develop the economies and social landscape of emerging market countries by providing entrepreneur-specific business knowledge, including business planning skills and Cisco's solutions for small and medium-sized enterprises.

Cisco has developed media-rich, business-relevant content from a variety of sources, including Stanford University, Cornell University, and My Own Business, Inc. It shares this expertise with entrepreneurs through a network of training centres and local institutes. The Institute currently offers workshops on starting, growing, and tech-enabling a business, which are led by local entrepreneurs and facilitators. Cisco provides the workshop content to training centres and local institutes at no cost. For workshop delivery, Cisco uses an open-source Web- and media-enabled platform. Training centres and local institutes can recover the cost of providing the workshops by charging a reasonable fee at their site and may not profit from the programme.

Outcomes

Two key partners, Stanford and Cornell, have been working closely with Cisco to develop educational video content for entrepreneurship. International content needs to be flexible so that it can be adapted to different legal environments and cultures. The Institute is currently active in Latin American, Africa, Central and Eastern Europe, Russia and the Commonwealth of Independent States, and the Middle East. Workshops run by the Institute aim to create virtual entrepreneurship communities.

After completing workshops, participants are asked to complete follow-up surveys at 6, 12 and 24 months post completion to keep them involved and to measure if the programme helped them achieve business success. The survey is geared toward capturing changing opinions over time to provide an overall picture and allow Cisco to continually improve the workshops.

Key Success Factors

- Identifying, training, and supporting strong partner organizations to act as institutes.
- Seeking customer feedback and adjusting to meet their needs.
- Having the right partners according to the local context.
- Creating a sustainable network and entrepreneur virtual community.

Challenges /Barriers

In cross-border activities, it is important to understand and adapt to the local culture. In addressing the local content issue, video is fastest and easiest. It is important to get feedback and modify the content as quickly as possible. The biggest challenge is finding local content or making international content relevant. Other challenges include bandwidth constraints in terms of speed, performance, and cost, as well as how to financially sustain the effort.

Future Plans

Cisco will continue to refine services based on customer feedback and relative demand.

To learn more about the Cisco Entrepreneur Institute's collaborative vision for developing entrepreneurial success, visit http://ciscoinstitute.net or contact the Cisco Entrepreneur Institute team at entrepreneurs@cisco.com.

Digital Opportunity Trust

Background

Digital Opportunity Trust (DOT) is a leading international organization, headquartered in Ottawa, Canada. DOT focuses on creating educational, economic, and entrepreneurial opportunity through the effective use of ICT for communities and people in the developing world, with a focus on youth and women. DOT operates programmes in Canada, China, Ethiopia, Kenya, Jordan, Lebanon, Turkey, Azerbaijan, Egypt, and the United States.

DOT was created in 2002 with funding from the Canadian International Development Agency (CIDA), USAID, and the Cisco Foundation. Since then, DOT has mobilized more than 750 young ICT interns who have cumulatively dedicated more than one million hours to positively affect the lives of more than 73,000 people in communities and schools around the world.

DOT's signature entrepreneurship programmes include ReachUp! and ScaleUp! These programmes train local interns to deliver entrepreneurship curricula to small business owners. In both programmes, interns act as mentors and coaches, linking participants to microfunding and business development opportunities. DOT and Cisco share a vision of a connected world in the 21st century, in which the human network and the power of teaching people how to use technology effectively are combined to produce scalable and sustainable entrepreneurship and educational development.

" Many agree that technology must play a greater role in our education system. Educators, governments, and businesses understand technology's role in preparing our next-generation workforce and the importance of competing in a borderless digital world."

John T. Chambers,
Chairman and CEO, Cisco

DOT utilizes a unique model to implement its programmes through local partners, local interns, and local communities. The core belief behind its model is the confidence that local partnerships are at the heart of sustainability and that localization of training, curricula, and people is fundamental to developing a meaningful and relevant relationship between technology and the entrepreneurs who use it.

Local partners: Typically DOT establishes a country office with local staff to develop regional partner networks, deliver training, stimulate business opportunities, and improve livelihoods. DOT encourages its country offices to become self-sustaining within three to five years. This is reflective of Cisco's intent to help foster sustainable innovation in the non-profit sector as way to achieve scale and long-term impact.

Local interns: DOT recruits, hires, and trains talented young men and women (usually university graduates) to become interns. These technology ambassadors are trained in leadership, project management, facilitation, communication, and teamwork. The internship programme allows talented young people to stay within their countries and use their skills to have a positive impact in their communities. Globally, interns experience an average employment/self-employment rate of 86%.

Local communities: Interns are deployed to local schools and community organizations, where they transfer their knowledge through practical ICT, educational, and business skills projects. DOT is able to achieve a multiplier effect by leveraging interns.

Key Partnerships

DOT's success lies in its ability to leverage partnerships with local and international organizations that share a common vision of a connected world in the 21st century.

DOT community partners include the following:
- Youth organizations, colleges, and universities.
- Business associations, women's advocacy groups, youth at risk organizations.
- Community telecentres and other NGOs.

Funding

In 2008 DOT Global was awarded more than CAD 6 million in programme funds from major donors including Cisco, the TOSA Foundation, the Kellogg Foundation, CIDA, and IBM. DOT was also asked to help in Cisco's US$ 45 million effort in China to respond to the Sichuan earthquake.

DOT also supports its country offices in local fundraising and sustainability endeavours. Country teams have established cost-recovery, fee-based training in Jordan and Kenya.

Outcomes

DOT's entrepreneurship curricula are developed in collaboration with local country staff. DOT employs a facilitated learning approach where learners actively participate in the learning event.

Everything DOT does is linked to a results-based management (RBM) approach. DOT provides clear and straightforward reporting on qualitative and quantitative indicators to its partners. DOT's entrepreneurship programmes have positively affected the lives of 3,000 community participants and 45 interns in Ethiopia and Kenya. The Lebanon programme will train an estimated 1,700 entrepreneurs, employ 32 interns, and establish eight self-sustaining business centres.

Key Success Factors

Country selection: DOT selects countries whose infrastructure, government, NGOs, and private sector can support new ICT initiatives to improve chances for success.

In-country offices: Country offices provide local context and insight.

Partner selection: DOT partners with NGOs and other community organizations that serve the target constituencies of youth, women, the under- and unemployed, and other disadvantaged groups, to help ensure that entrepreneurship training reaches its target audience and creates local ownership.

Listening: DOT collaborates with partners at all levels to ensure that local buy-in is present at every step, that the training is appropriate to context, and that the global network of staff, interns, and partners has the means for frequent and constructive communication.

Challenges/Barriers

DOT is challenged by the short-term nature of funding. Change is incremental and embedded impacts may not become apparent for years.

At the local level, the most significant challenge is the cost and availability of ICT facilities.

Another significant challenge is making sure that ICT facilities are women-friendly. Creating a women-friendly environment includes paying attention to hours of operation, toilet facilities, prayer rooms, and cultural considerations.

Lessons Learned/Recommendations

Country teams often need to be educated on the importance of meaningful metrics and evaluation as a management tool for internal improvements, and as a way to demonstrate a high return on investment for participants and donors.

Future Plans

DOT will expand to additional TeachUp! schools in United States, and is exploring ways to integrate financial literacy and entrepreneurship into school district curricula. DOT and Cisco will add additional schools in China and are exploring possible expansion into Mexico. DOT expects to deepen its entrepreneurship work in Africa (Kenya, Ethiopia, and Rwanda); the Middle East (Jordan, Lebanon, Egypt); and Southern Europe and the Caucasus.

More information about DOT can be found at www.dotrust.org

4.3 Goldman Sachs

Goldman Sachs Interviewees

Amy Bradshaw, Corporate Engagement

Jennifer Field, Corporate Engagement

Anuja Khemka, Corporate Engagement

Background

Goldman Sachs philanthropy builds upon the firm's long tradition of service. Initiatives combine the firm's core business strengths with high-impact charitable programmes and best-in-class partners to deliver measurable results for the communities in which the firm operates.

The Goldman Sachs Foundation supports programmes that promote and advance leadership, entrepreneurship, business education and training. Specifically, the Foundation supports programmes offering high-quality instruction that prepare a new generation of young global innovators – the new "social entrepreneurs" – who are generating cutting-edge solutions to complex social problems.

In recent years, Goldman Sachs (GS) has accelerated its overall commitment to education and entrepreneurship with a focus on women's empowerment with an integrated strategy that effectively impacts these areas and engages the people of the firm.

Key Programmes

Specific Programme in Education Targeting Women:

10,000 Women

10,000 Women is a global philanthropic initiative that invests in the exponential power of women as entrepreneurs and managers, guided by the knowledge that extending more opportunity to women is one of the most powerful means to greater and shared global economic growth. Launched in March 2008, the programme is investing US$ 100 million over five years to provide 10,000 underserved women around the world with a business and management education. By supporting partnerships between a global network of universities and non-profit organizations, the initiative funds business and management education certificate programmes and offers a suite of critical 'wrap-around services' for programme participants. 'Wrap-around services' include mentoring, networking, access to capital opportunities and professional development activities. *10,000 Women* furthers this investment by supporting robust capacity building efforts with developing country educational institutions, thereby improving the quality of education in developing regions for generations to come.

Approximately 20% of the financial investment in the programme is focused exclusively on capacity building activities. The initiative will train 2,000 professors, create 200 new case studies with local emphasis, and develop innovative, comprehensive curricula. The initiative also works with premiere development and nonprofit organizations including Vital Voices Global Partnership, the International Center for Research on Women (ICRW), and Women for Women International to strategically leverage efforts and to better understand the local challenges girls and women must overcome.

10,000 Women was founded on economic data proving that educating and empowering women may have the highest social return of any investment. As highlighted in *Women Hold Up Half the Sky*, a Goldman Sachs research report, and confirmed by the World Bank and other development experts, "female education is a key source of support for long-term economic growth…linked to higher productivity; higher returns to investment; higher agricultural yields; and a more favorable demographic structure...feed(ing) a virtuous cycle, supporting continued investments in education and extending the gains to human capital and productivity."

Investing in women has been proven to raise GDP in emerging markets by significant and quantifiable amounts. *10,000 Women* fuels the "multiplier effect" of investing in women through a model that addresses an area of "white space" at the intersection of small to medium-sized enterprise (SME) development, women's empowerment, tertiary business education, and business certificate training. *10,000 Women* also seeks to inspire further investment in women's empowerment and equity issues, and to push the envelope of corporate philanthropy by sharing our innovative model that capitalizes on the resources, diverse perspectives, and shared missions of different sectors in a collaborative and effective way.

10,000 Women uses a state-of-the-art measurement system that includes Randomized Control Trials (RCTs) and quantifies number of graduates, small to medium-sized enterprise growth, and community ripple effects. The measurement system also facilitates a sharing of information between a learning community of partners, and with the development community, to enhance all stakeholders' work in advancing women's education and empowerment. The people of Goldman Sachs, of all levels from offices around the world, also actively contribute to the initiative, serving as guest lecturers in the classrooms of global academic partners, participating on advisory and scholarship selection committees, providing programmatic consulting, and serving as mentors. *10,000 Women* scholars are paired with GS mentors, forming relationships through online and in-person interactions that bring the programme to life.

10,000 Women has been praised by leaders including Ngozi Okonjo-Iweala, Managing Director of the World Bank, who stated that *10,000 Women* is "not just a programme, it's a movement."

Specific Programmes in Entrepreneurship Education to Develop High-Potential Youth:
National Foundation for Teaching Entrepreneurship NFTE
National Foundation for Teaching Entrepreneurship (NFTE) is a global leader in providing high-quality and rigorous entrepreneurship education to pre-college youth. The NFTE/GSF partnership offers youth from underrepresented groups, particularly those living in low-income areas, with high-quality entrepreneurship education, both "face-to-face" and online. An innovative set of interactive, hands-on tools and programmes offer teachers and students the opportunity to "bring to life" what is learned in the classroom and develop skills required of an effective entrepreneur and leader.

In the United States, NFTE serves as an important partner in the Foundation's Signature Initiative programmes working to develop high-potential youth into future leaders. Since inception, the NFTE/GSF partnership programmes and resources have reached approximately 17,000 talented Signature Initiative youth. A 2008 independent evaluation conducted by Brandeis University of more than 700 NFTE students found that NFTE increases college aspirations and spurs independent reading outside of class. Other past research shows that students significantly increase their entrepreneurial knowledge and leadership skills. Nearly 300 Goldman Sachs professionals have been engaged in these efforts as board members, business plan judges, mentors, classroom speakers, and in other capacities.

During 2006, the GSF/NFTE partnership introduced entrepreneurial education programmes in China and Germany. In China, the GSF/NFTE partnership is implemented through the Bright China Foundation – a Chinese non-profit dedicated to building the capacities of low-income and at-risk communities. With Foundation support, the Bright China Foundation developed and has provided entrepreneurship training and education programmes to low-income students in 10 provinces. Since 2003, the programme has reached more than 13,000 students and trained 323 teachers.

The Foundation also helped launch NFTE Deutschland, which has served nearly 3,000 students and 437 teachers in eight German states with large low-income and immigrant populations. Consistent with our focus on leadership development, the effort includes an advanced entrepreneurial skills development camp for talented underrepresented students.

A key event of the NFTE/GSF partnership in helping develop high-potential youth is the Goldman Sachs Youth Entrepreneurship Expo. This annual national event, held at the Goldman Sachs headquarters in New York City, spotlights students from our developing high potential youth programmes who have excelled in months-long study and training in all facets of business planning. At the Expo, student teams take part in a business plan competition, present their ideas and plans, and prizes are provided to the winners. Goldman Sachs professionals coach students on their presentations, and others are on hand to judge the teams.

Another important programme of the GSF/NFTE partnership is the summer BizCamp initiative. Since 2005, more than 200 students from around the US have participated in this intensive week-long, residential camp conducted in partnership with Duke University's Talent Identification Program (TIP) and Johns Hopkins University's Centre for Talented Youth (CTY). At BizCamp, students delve deeply into all aspects of business and entrepreneurship, working towards individual or group business plans and going on field trips to local businesses. In 2009, NFTE plans to host two camps, one at Duke and the other at JHU, for over 170 Next Generation Venture Fund students from seven or more states. This summer initiative has been building great momentum every year. Winners proceed to the annual GSF/NFTE Youth Entrepreneurship Expo in New York City.

Goldman Sachs Global Leaders Program (GSGLP)

For eight years, the Goldman Sachs Global Leaders Program (GSGLP) has supported young leaders around the world by providing enhanced leadership training, gatherings with world leaders, relationship-building activities, and opportunities for social entrepreneurship to extraordinary young people at a critical stage in their lives. Developed in 2001 in partnership with the Institute of International Education (IIE), the programme has quickly distinguished itself as one of the most prestigious and distinctive awards programmes of its kind. To date, 900 students representing more than 100 colleges and universities in 20 countries have participated in the programme as Global Leaders.

Nearly 250 renowned leaders from a broad range of disciplines have engaged students in meaningful dialogue about critical global issues. The GSGLP has an Alumni Program which is forging new relationships through in-person dialogues, trainings, and gatherings, as well as through an online resource centre and alumni directory. GSGLP alumni have access to an annual Social Entrepreneurship Fund competition through which 53 Global Leaders from 18 countries have received project funds totalling close to US$ 300,000. Such projects have addressed important issues such as literacy, poverty, AIDS, the environment and education around the world.

Prep for Prep

The Prep for Prep/Goldman Sachs Foundation Institute for Entrepreneurship (IFE) offers four weeks of summer entrepreneurship training culminating in a business plan competition for 40 talented students from underrepresented backgrounds. The Institute is held at Goldman Sachs' offices where, over the last seven years, more than 50 Goldman Sachs volunteers served as business plan mentors and competition judges. Initial evaluation results show that 96 % of participants found the IFE to be an exciting way to channel hobbies while learning ways to provide economic progress in communities.

Girls Inc.

Through a Foundation-supported competition, Girls Inc. – one of the nation's most well-established and well-respected non-profits focused on the education and leadership development of secondary schoolgirls from low-income backgrounds – helps girls to develop and launch business plans. Since inception in 2006, the initiative has attracted more than 110 competitors; many have travelled to New York for a unique summer "corporate camp" experience that provides advanced entrepreneurship and business training as well as the opportunity to see high-powered entrepreneurs at work. During the three years of the event, 30 Goldman Sachs professionals – from all levels of the company – have served as judges for the national competition and mentors for teams.

Additionally, 50 women leaders from the Goldman Sachs Investment Management Division Women's Network have supported and participated in the programme by mentoring students and providing guidance on their business models, elevator pitches, presentations, and sales/marketing plans. Evaluation reports indicate that 100 % of participants reported the programme had "helped them to understand entrepreneurship better" and enhance their visual and oral presentations skills. More than four-fifths reported that the camp had influenced their career goals.

NCEE

In partnership with the NCEE, the Foundation implements the NCEE/Goldman Sachs Foundation National Economics Challenge. Now in its seventh year, the Challenge brings together thousands of high school students who have demonstrated exemplary knowledge in economics for a competition that tests their ability to apply it. Several benchmarks are used for assessing the programme's impact; for example, Challenge participants' results on AP Economics tests tend to exceed those of their peers. Goldman Sachs economists serve as judges, and firm leaders officiate at regional events. Well over 1,000 teams representing nearly 500 schools nationwide and involving 5,300 young people participated in 2007.

SIFE

SIFE (Students In Free Enterprise), with Goldman Sachs Foundation support, engaged teams of college students studying business, economics and related fields in the United States, Germany, and China to teach capital markets to high school students in these countries. Curricula and other resources from the firm's Global Markets Institute have been incorporated into the training and instructors from Goldman Sachs have participated in the events.

In China, 41 teams involving over 3,000 college students implemented projects teaching capital markets that reached over 30,000 high school students. In Germany, 10 teams involving close to 60 college-student educators developed projects to reach over 1,200 high school students. In the United States, 48 SIFE teams, including 350 student educators, conducted projects educating over 3,000 high school students.

Evaluation results demonstrated that in all three countries, the instruction led to an increase in knowledge among high school participants. SIFE teams' instruction in China, for example, led to a 60 % increase in knowledge among high school participants, and in Germany, an 80 % increase in knowledge. Pre- and post-test measurements for the US programme showed a 91 % knowledge increase and significant behavioural changes among students. Across all three countries, three-fourths of participants indicated that participation had "increased their understanding of capital markets and the important role they play in the global economy."

Key Partnerships

For *10,000 Women* Initiative: Multiple academic and non profit partners.

For Youth programmes: NFTE, Girls Inc, Prep for Prep, NCEE, SIFE and Institute of International Education (IIE).

Funding

Grants funded by the Goldman Sachs Foundation or Goldman, Sachs & Co.

Key Success Factors

- Sustained commitment and engagement of Goldman Sachs' senior leadership and professionals of all levels is essential for programme impact and innovation.
- Leveraging of the firm's core competencies and resources for the programme's mission and strategy.
- Support of effective, strategic partnerships between corporations and non-profits.

Challenges/Barriers

- Measurement of results. For the *10,000 Women* initiative, an outside consulting firm is helping develop an evaluation methodology that will measure and report on a variety of metrics.

Lessons Learned/Recommendations for others

- The boldness of *10,000 Women* - the five year, US$ 100 million commitment, the development gap targeted, the clearly-defined programme model and extensive

measurement system - enhanced the level of attention and interest from stakeholders. Making a significant, defined commitment creates opportunity and momentum that smaller philanthropic endeavors might not, increasing social impact as well as maximizing positive business benefits.

- Our convening power as a global corporation has enabled us to bring together the best minds from a variety of disciplines to create innovative solutions for targeted social problems.
- Selecting investments and partnerships that align well with the firm's business competencies and interests. Selecting partners that demonstrate capacity and strong comparative advantage in the field.
- Importance of metrics – clearly articulated at the outset (and assessment process) as a part of the firm's investment.
- Multiple, carefully targeted "investment streams" – financial, intellectual and human capital.

Future Plans

- Continue to engage Goldman Sachs employees and maintain the firm's rich tradition of service and community support.
- Expand *10,000 Women* to reach our goal of 10,000 women trained in five years. Explore further growth opportunities and partnership proposals from universities, non-profits, significant philanthropists and other global corporations.
- Share our diverse philanthropic model with stakeholders to inspire similar commitments.

4.4 INTEL

Intel Interviewees

Mark Harris, Associated Professor for Technology Entrepreneurship & Innovation; Director Higher Education & Research Europe, Middle East, Africa Corporate Affairs Group

JoZell Johnson, Global Manager – Intel® Higher Education Program

Lara Timanis, Specialist for Applied Education Research and Policy Standards

Background

For nearly 40 years, Intel has been fostering the next generation of innovators through its extensive commitment to education, including wide-ranging support of universities and university students around the world. The **Intel® Education Initiative** includes teacher training programmes, promoting excellence in science and math, encouraging technology innovation at universities and community learning.

Key Programmes

The **Intel® Higher Education Program** is a collaborative worldwide effort between Intel and more than 150 universities in 34 countries. The programme provides students with access to world-class research leadership, direct technology support and technology entrepreneurship skills to help move the resulting technology expertise and knowledge to the local economy.

Technology Entrepreneurship Education Program

Technology Entrepreneurship is filling a gap in entrepreneurship education. While students of business schools are educated in the principles of entrepreneurship, this is not so for the technical disciplines. Yet, the technical disciplines are where most innovation happens. Students creating new companies out of technical innovations were previously amateur entrepreneurs. The Technology Entrepreneurship Education Program is focused on filling this gap and creating professional entrepreneurs.

To encourage and prepare students everywhere to become tomorrow's technology entrepreneurs, Intel provides entrepreneurship education to professors, including educational seminars, global faculty colloquiums and local and global entrepreneurship competitions for student teams. Intel, in collaboration with the Lester Centre for Entrepreneurship and Innovation at University of California, Berkeley, provides:

1. Theory to Practice Seminars

These seminars are designed to encourage entrepreneurial creativity at universities around the world. The Theory to Practice Seminars train academic faculty about the concept and value of technology entrepreneurship, and demonstrate how to build entrepreneurship programmes that drive new uses of technology and promote successful technology commercialization. The seminar is designed for engineering or science faculty at technology-oriented schools, and faculty from complimentary business programmes. Seminar topics include:

- Building a curriculum
- Recruiting faculty
- Adapting materials to your local situation
- Use of mentors, guest lecturers and others in support of your programmes
- Creation of an entrepreneurial ecosystem

Each seminar is an active, comprehensive, two days of participation and learning shaped to match the local entrepreneurial and technology environment, but with a solid foundation in the model curriculum used at UC Berkeley. The seminars are held at universities around the world. The curriculum can be viewed at www.intel.com/education/highered/entrepreneur/index.htm

2. Global Faculty Colloquium

This is a programme, held at Berkeley, that trains university faculty and helps them create and operate a multi-disciplinary, multi-functional entrepreneurship centre. It also allows for the sharing of faculty experiences along with the development of a plan for the professors to execute when they return to their universities. The participants of the Global Faculty Colloquium have typically already participated in a Technology Entrepreneurship Seminar and have been identified by their government or university to be a potential in-country "replicator" of the seminar series. This is the model for scale of the programme.

3. The Intel+UC Berkeley Technology Entrepreneurship Challenge

Founded in 2005 through collaboration between UC Berkeley and Intel, the Intel+UC Berkeley Technology Entrepreneurship Challenge (IBTEC) seeks to support and promote entrepreneurship globally. The local "regional" competitions are predominantly in developing countries. The Challenge also permits developed countries to participate in a "fast-path" fashion thus creating a truly global and top-notch competition. The programme is designed to showcase global business opportunities that have the greatest potential for a positive impact on society through the deployment of new and truly innovative technologies. Not only does the winning team receive US$ 25,000 and the winning title, but they also have direct visibility and interaction with over twenty leading venture capitalist firms.

Why do you need a business plan competition? If you are lecturing computer programming to students, you then send them to a computer lab for them to practice their newly acquired theoretical skills. Where do you send young student entrepreneurs? From the educational aspect, the IBTEC is a "lab" for the students.

Other higher education programmes (but not the focus in the rest of this case study) include:

Technology Curriculum

Intel provides free cutting-edge technology curriculum to engineering universities. This curriculum, developed by leading faculty around the world, helps professors include the latest technology in their lesson plans. It encompasses the following disciplines:

- Intel Multi-Core Technology
- Signal Integrity
- Microelectronic Fabrication
- Microelectronics Packaging
- Very-large-scale Integration (VLSI)
- Network Processing
- Embedded Computing
- Wireless Computing

Research with Universities

Investment in high tech research is key to developing the next generation of technological breakthroughs. To help foster such innovation, Intel is working with universities worldwide through a variety of programmes, including regional academic forums, university research grants and the funding of open and collaborative research labs. More than 250 Intel-sponsored research engagements are underway at universities throughout the world.

From the University of the Philippines to the University of Costa Rica to National Taiwan University, Intel has supported research on everything from silicone modification to digital health, resulting in global recognition, increased credibility and funding, and the furthering of the boundaries of science.

The Intel Research Network of Labs

The Intel Research Network of Labs operates under a model of collaboration between industry and academia. Wholly owned and funded by Intel, these labs allow scientists and engineers to dream up new ways to meet performance challenges. What makes these labs unique is the open and collaborative research model under which they operate. Pioneered to enhance and accelerate long-term research, this system eliminates conflicts over

intellectual property rights that often hinder or prevent many collaborations between companies and universities, allowing for the free exchange of ideas.

Intel Academic Forums

For more than a decade, these regional forums have fostered interaction between Intel and leading universities by providing faculty and researchers direct access to Intel technologists, as well as a forum to highlight their ongoing research. This link with global technology leaders fosters innovative discussion and lays the frameworks for ongoing partnerships.

Student Support Programmes

Intel's student support programmes target students studying technical disciplines that support the Information Technology industry such as electrical engineering, computer science and manufacturing. Student support programmes are tailored to meet the needs of the specific region or country where they are implemented, and include undergraduate scholarships, graduate level fellowships and student research contests.

Intel Scholarship Support

Intel scholarship programmes are tailored by the Intel regional sites. In the US, for example, programmes include undergraduate scholarships available at schools local to Intel site communities, masters level programmes supported through a national consortium focusing on diverse populations and Intel PhD fellowship programmes supported through national tier one universities. Globally, all programmes are administered directly through supporting universities.

Intel Student Research Contests

Research contests seek to highlight emerging technology by providing students the hands-on opportunity to experience a specific technology and develop a targeted project. These contests are supported regionally by Intel sites. The 2007 Intel National Multi-core Programming Contest in China received over 5,750 applicants and almost 1,000 participants moved to the 1st round of the competition. Students work with their college or university

professor to develop their product or skills, consulting with designated Intel researchers along the way who provide key technical expertise. These contests traditionally conclude with the student presentations to an Intel panel of experts, and are currently in place in India, the People's Republic of China, Mexico and Taiwan.

Undergraduate Research
Intel's undergraduate research programme engages students directly in ongoing research teams at their university to provide them with "hands on" research experience in their chosen field. Programmes such as these have been shown to dramatically increase the retention of technical students in their fields and encourage students to continue their education and enter graduate programmes.

Students are assigned to standing research teams under the direction of professors and matched with mentors who oversee their day-to-day activities.

Intel believes all students, everywhere, deserve to have the tools they need to become the next generation of innovators. From local schools to global universities, Intel works to help improve the quality of education around the world.

To learn more about Intel's commitment to education, please visit www.intel.com/education.

Key Partnerships
Intel has developed a strong partnership with the Lester Centre for Entrepreneurship and Innovation at Berkeley's Haas School of Business. In addition, partnerships have been developed with over 150 "lighthouse" or reference universities around the world as well as with local partners, including policy-makers and NGOs.

Funding
Over the past decade alone, Intel has invested more than US$ 1 billion in cash and in-kind contributions to help teachers teach, students learn and universities innovate – particularly in the areas of math, science and technology.

Entrepreneurship activities in certain countries are conducted with the support of state and local governments. Intel has two people at corporate level to support the programme but they also handle other responsibilities. In the regions, there are one to two higher-education Intel contact people who handle the partnerships with the universities and local entities. The goal is to leverage as much as possible through these local partnerships.

The local seminars are offered free. The global two-week workshop at Berkeley is also free (including travel), but only offered to the top professors identified through the local workshops.

The Technology Entrepreneurship Challenge is financed through the Intel Foundation with funds matched locally.

Outcomes
Intel's set of entrepreneurship education technology programmes was launched in 2005. The idea was to serve as a catalyst and partner with other organizations to develop the curriculum, research and teaching at universities around the world (Europe, Middle East and North Africa, Latin American, China and India are the key regions/ countries) with a focus on professors teaching technology.

The **Theory to Practice Seminars** take place in various countries and are about four days long. Initially these workshops were only for 20-25 professors but now government officials, NGOs and other key actors in the ecosystem are invited as well. Since the programme started, more than 40 seminars have been held, reaching more than 800 participants.

Following the seminar, the top professors are invited to an intensive two-week **Global Faculty Colloquium** that takes place at Berkeley. There are no formal commitments or requirements for the professors following the programme at Berkeley. However, the programme does build a complementary longer term relationship. Outcomes include the number of new courses developed after professors participate in the programme and the role the professors

play as champions for entrepreneurship, both within the university and the local ecosystem. To date, two programmes have been held which have trained over 100 professors.

The **Intel+UC Berkeley Technology Entrepreneurship Challenge** rewards business plans that move technology out of labs and into local communities where they can have a positive impact on society. It is currently running in the Middle East, Central and Eastern Europe, Russia, India, China, Mexico, Brazil, Chile and the US. This programme is implemented locally, in partnership with universities and NGOs, not as "Intel." Cash prizes are awarded locally on a scale appropriate to the region but are meant to be a token, not the focus. More importantly, the teams are provided feedback and training. The local competitions are followed by regional and international competitions, which enable Intel to keep in touch with how the teams are developing.

Indicators/measures of success include sustainable change in the local environment, creating a pipeline of innovative ideas that can change the way of thinking about bringing products and ideas to market. More specific measures include the number of business plans received and the number that make it to the final review. In the first year, there were 100 applications in the first stage, which were narrowed down to five in the final review. Last year, there were thousands of applications including more than 500 full business plans and about 100 in the final review. The international competition held at the Haas School of Business, in Berkeley, California, hosted 22 teams from 14 countries in 2008.

Key Success Factors

The role of the universities and professors as well as the engagement of the local ecosystem.

Challenges/Barriers

Monitoring the longer-term impact of the programmes to make sure that the result is not just start-ups, but innovation within companies and sustainable growth companies.

Lessons Learned/Recommendations for Others

It is not enough to support the universities. Some universities are very traditional and are unwilling to change their curriculum. Intel has therefore had to find institutions beyond the traditional training models and to encourage others in the local environment to think outside of the box. There is also a need to support the infrastructure and local ecosystem. This is why it is crucial to include policy-makers, NGOs and other key stakeholders in the ecosystem in the local training programmes.

Future Plans

The programme was initially focused on emerging markets but began receiving requests from developed countries as well. The programme is therefore continuing to expand in both areas. The focus remains on entrepreneurship education in technology disciplines, not in business. Intel will be looking more into incubator models as well as other infrastructure and ecosystem aspects.

In terms of measures, Intel plans to work on developing more specific measures of outcomes. This is particularly important given the significant financial support being given to the programme.

Intel has a strong commitment to the programme as well as to its continuous improvement, monitoring what is working and what is not, adjusting as necessary.

4.5 Microsoft

Microsoft interviewees
Kate Barnes, Entrepreneurship Forum Project Co-ordinator
Elena Bonfiglioli, EMEA Director of Corporate Citizenship
Kimberly Voltero, Worldwide Academic Marketing Manager

Background

" Educate, innovate and undertake. These are three elements of paramount importance to fostering a healthy entrepreneurial ecosystem and they become even more relevant when all other resources become scarce, particularly in times of economic downturn. Long-term success requires the synergy of public and private partners coming together to provide the right framework for young business to flourish and entrepreneurship education drives the first phase of the entrepreneurial lifecycle. At Microsoft we are committed to supporting every stage of this lifecycle with the end goal of developing SMEs, progressing innovation and driving growth."

Elena Bonfiglioli,
EMEA Director of Corporate Citizenship,
Microsoft

Microsoft believes that technology is a vital strategic and communication tool to achieve the potential of entrepreneurship in the 21st century. Microsoft's entrepreneurship initiatives are part of the company's business and citizenship focus to foster innovation and promote 21st century skills for employability. Microsoft is helping start-ups around the world realize their potential by providing world class tools, technologies and market resources to students and entrepreneurs, bringing new ideas, new companies and new software innovation to life. This commitment is grounded in the overarching goal to support growth and jobs through the provision of relevant, affordable, inclusive and accessible technology for all.

Key Programmes
Today in Europe and globally, Microsoft acts on its commitment to support the inclusion of entrepreneurship in education and learning through five main initiatives.

1. Microsoft Entrepreneurship Forums in partnership with universities across Europe.
In 2008, Microsoft launched a series of Entrepreneurship Forums working in close collaboration with universities and government-supported SME incubators across Europe. The driving force behind the initiative is to give students an insight into the ways in which technology can be used to enable them to develop and apply their capacity as innovators and as the leaders of tomorrow – the "creative class" of the future who will help drive Europe's knowledge economy in new and exciting directions.

The Entrepreneurship Forum seeks to foster excitement about entrepreneurship and promote its infusion in the curriculum and educational experience of students and faculty by demonstrating some of the technology skills, curriculum, partnerships and attitudes required to enable the innovators of tomorrow. The Entrepreneurship Forums aim to break down barriers and overcome the fear and distance that at times arises for young students to approach the concept and practice of entrepreneurship. During 2008, Microsoft cooperated with 25 leading universities in Europe to hold campus events that promote the importance of innovation and entrepreneurship, bring the real stories of young successful entrepreneurs in touch with students and encourage students' involvement in business through inspirational key-notes, interactive debate and technology demonstrations. To date, over 5,000 students across Europe have been reached.

The events bring together and seek active engagement of local venture capitalists, NGOs and social entrepreneurs, local SME partners and Microsoft employees, to interact with students and faculty in a real marketplace of ideas, solutions and experiences.

The Forums mobilize Microsoft and partners' employees to share their experiences and, where possible, to engage young and high potential talent from the companies in mentorship and support.

" The true role of education is to form students – motivated people, people dedicated to achieving success. The entrepreneurship concept is based on the opportunity to offer our students the right tools to explore their creativity. We are pleased to host this event and welcome Kevin Turner to our university."

Rector of The Academy of Economic Studies, commenting on the Romanian Entrepreneurship Forum

2. Microsoft Software Business Management for Students Curriculum

This initiative introduces business strategy and entrepreneur-ship content into the technical curriculum of universities and technical colleges. Within this curriculum the software entrepreneurship content provides students with information to fuel innovation, support entrepreneurialism and aid the employability of the next generation. Often tech students are teamed with business students of the age range 16-25. The pilot began in eight countries, reaching hundreds of students, and now the curriculum is freely available worldwide on Microsoft's Faculty Connection.

"NCGE is committed to supporting and encouraging the entrepreneurial endeavours of UK students and graduates. We are delighted to continue to support Microsoft and the Entrepreneurship software curriculum for universities which it is developing. We believe this work will make a significant contribution to helping students develop their entrepreneurial skills and ultimately benefit our knowledge economy."

Lorna Collins, Director of Flying Start at the National Council for Graduate Entrepreneurship

3. Microsoft Imagine Cup

Imagine Cup is the world's premier student technology competition, challenging students around the globe to imagine a better world empowered by technology and created by their talent and innovation. This student competition attracts about 200,000 registrants each year in 100 countries. Students compete in nine categories with

a strong entrepreneurship spirit working on a range of activities spanning software design and short film to challenges involving algorithms and programming. After advancing through online, local and regional Imagine Cup competitions, qualifying students convene at the annual world championships to present their entries to a panel of judges from academia and the technology industry. The prize is US$ 25,000 and winning can be life changing, especially for people in developing countries. Students who win often become well-known in their town, region or country.

Winning contestants are invited to the Imagine Cup Innovation Accelerator, which propels Imagine Cup software design champions into the next stage of developing their innovative ideas as a business. The Imagine Cup Innovation Accelerator, sponsored since 2007 by BT, is a prize awarded to the best software design teams from the Microsoft Imagine Cup Worldwide finals. Teams selected for the Innovation Accelerator programme receive technical support and business coaching to create the must-have technology and communications applications of the future. Over an intensive two-week period, students further develop their designs and viable business plans by pitching their plans to VCs with close guidance from some of the best minds at Microsoft and BT.

To extend the value of the Imagine Cup Innovation Accelerator, the winning teams that have competed in national Imagine Cup finals travel to and experience the hosting countries, including Brazil, Japan, the UK Netherlands, Germany, Poland, Italy and Spain, where the Innovation Accelerator programme is run.

" I think the Imagine Cup gives students an amazing ability to think beyond the usual boundaries to develop solutions to solve real global issues."

Brian Thomas,
2007 worldwide finalist in Seoul,
South Korea

4. Microsoft BizSpark, a global start-up programme

Microsoft BizSpark is a global programme designed to accelerate the success of early stage start-ups. From November 2008 it is available in countries from the US, Canada, Western, Central and Eastern Europe, to India, China, Asia Pacific and Latin America. Middle East and Africa will launch early 2009 thus helping support the next generation of software entrepreneurs from developed – and developing – economies.

BizSpark provides entrepreneurs fast and easy access to current full-featured Microsoft development tools and productions licenses of server products, with no upfront costs and minimal requirements.

The programme increases their probability of success because it gives companies access to technology (from Microsoft) but also access to a broad network of partners so that technology start-ups have the best possible start. This community of organizations, investors, government agencies, incubators, universities, technology parks and other groups can provide guidance, mentoring, financing and resources to start-ups.

By virtue of their participation in BizSpark, start-ups can also gain visibility with potential investors, partners and customers.

Each BizSpark start-up will have the opportunity to profile their company in the BizSparkDB, an online start-up directory, hosted on the Microsoft Start-up Zone website. Start-ups get exposure to potential investors, partners and customers around the world.

Helping to increase visibility is the opportunity to be highlighted on the BizSparkDB as a featured company and be promoted as BizSpark Company of the Week on the Microsoft Start-up Zone website: www.MicrosoftStartupZone.com.

BizSpark is for start-ups that are actively engaged in the development of a software-based product or service, are privately held and in business for less than three years, with annual revenues less than US$1 million.

" We believe that focusing on start-ups and entrepreneurs – enabling them with a better network of advice, support and finance – is critical to the success of software economies worldwide. Many governments focus on SMEs and now Microsoft, together with a broad network of partner organizations, is delivering a rich platform from which technology entrepreneurs can succeed and grow. This is particularly important during an economic downturn and this programme will stimulate growth at a time when confidence may be low and access to finance restricted. From TiE to JA-YE, EO, NVCA to government agencies, our network partners are now proactively supporting this group of start-ups and helping create the next generation of high-growth software companies around the globe."

Claire O'Halloran,
Emerging Business International, Microsoft

5. Microsoft Innovation Centres (MICs)

The Microsoft Local Software Economy (LSE) Initiative is a catalyst in the creation of vibrant national software economies, working with local communities to accelerate innovation in the ICT industry and create job opportunities that foster socioeconomic growth. LSE teams in more than 60 countries work closely with local stakeholders to foster strong, self-sustaining software ecosystems that advance countries' overall economic health. Key LSE priorities include:

- Supporting government programmes that encourage entrepreneurial growth in the ICT industry

- Cultivating local communities of qualified IT product and service providers
- Strengthening the competencies of local software developers
- Providing college students with training and work experiences that boost their employability
- Helping new businesses overcome challenges and capitalize on opportunities

Microsoft's network of 110 MICs serves 100 communities in 60 nations, and will grow to 200 centres in 85 countries by 2009. MICs provide access to world-class resources for software developers, IT professionals, students, academic researchers and entrepreneurs. MICs focus on:

- Building skills and intellectual capital through training courses, employment programmes and mentoring experiences (Examples include software business management, Quality Certification, Mini-MBA and Innovation Days.)
- Fostering industry partnerships through programmes that help companies to work more successfully with Microsoft, as well as through the cultivation of local and regional industry alliances
- Increasing innovation at the local level through hands-on engagements, such as labs geared towards the interests of independent software vendors (ISVs), start-ups, partners, students and entrepreneurs (Examples include proof of concept, architectural reviews and interoperability labs.)

" As knowledge and innovation become the primary catalysts for economic growth, the Microsoft Innovation Centres can play a vital role in generating powerful new ideas through training, education and knowledge transfer."

Sanjay Parthasarathy,
Microsoft Corporate Vice-President

Other entrepreneurship programmes (but not the focus of this case study) include:

Microsoft is committed to a long-term strategy in support of the growth and competitiveness of Small and Medium-Sized Enterprises (SMEs). Microsoft, representing an ecosystem consisting of more than 250,000 partner companies in Europe alone, has adopted a Lifecycle Approach to SMEs. Microsoft's five-stage Lifecycle approach aims to foster an environment where enterprise and innovation can flourish through the following stages:

- Stimulating Entrepreneurial Mindsets
- Turning Ideas into Business
- Supporting SMEs with Tools for Competitiveness
- Enhancing the Skills of the SME Workforce
- Enabling a High Growth Competitive Ecosystem

To this end, Microsoft supports several programmes in each specific phase of the SME Lifecycle. In addition to those listed in the main body of the case study, one global example is:

EU Grants Adviser Program (EUGA): Facilitating access to funding and mentoring for the development of SMEs
EUGA is a programme developed by Microsoft and others, including Intel and HP, in response to the European Union's Growth and Jobs Agenda. Through EUGA, SMEs can use a portal that helps them identify and apply for EU funding. EUGA greatly simplifies a process that is far too complex for most small businesses and young entrepreneurs. The overall objective is to help Europe's SMEs innovate and grow through the use of new technologies, and to do so EUGA helps projects get funding. To date, over 300 million euros worth of projects are in development.

EUGA has been launched in 26 EU member countries and will be rolled out in two non-EU pilot countries during 2009. Some important facts:

- Over €236 million of EU and national government funding awarded as a result of EUGA.
- 1,361 grant application projects are either successfully completed or in progress through EUGA and it boasts an 82% application success rate.

- 98 consortium members across the region.
- Over 105,000 people to be trained from grants awarded. Last year, EUGA impacted over 113,000 companies.
- About 8,968 jobs have been or will soon been created by awarded EUGA projects and over 100,000 people are to be trained.

> *" This grant means we'll be able to complete the project much faster than we would have done otherwise. Our new business integration server will improve our service offering – something that would have been more difficult without EUGA's help."*
>
> Fredrik Svard, CEO, FS Systems

Other relevant initiatives include:

- Working with venture capitalists to support new SMEs
- Policy advocacy and awareness raising
- Community support to social entrepreneurship and microcredit

Key Partnerships
(for the entrepreneurship education and learning programmes)
Partnerships with schools and universities:

- Microsoft Developers Network Academic Alliance with institutions that are given MS software (15,000 subscribers in total).
- Microsoft IT Academy where institutions are given access to Microsoft official curriculum, software and books to efficiently educate students in technology skills (5,000 institutions worldwide).
- Closer/highly motivated relationships with about 100 institutions for Imagine Cup (they provide mentors, etc.) and Microsoft Students to Business (connecting Microsoft partners to qualified students).

Partnership with Junior Achievement

Working in partnership with Junior Achievement (JA), Microsoft aims to foster a culture and a mindset of innovation and entrepreneurship for young people. Through strategic grants, the provision of technical tools to enhance the capacity of start-ups, volunteering support and collaborative forums that raise awareness to enterprise in education, Microsoft and JA address the challenge of creating a more supportive environment for young entrepreneurs. JA reached 9.3 million children and youth around the world in 2008.

To take an illustration of this partnership; Junior Achievement Latvia (JAL) has focused on providing business education and practical experience to more than 69,768 pupils in Latvia since 2008. Microsoft has a strong collaboration with JAL, which includes the provision of software to enable the strategic use of technology in JAL's efforts to develop a new portal for school children and teachers.

Other partners include governments, NGOs, business angels, venture capitalists, telecommunications and hosting companies, and investment banks.

Funding

These programmes are centrally funded. However, Microsoft subsidiaries in country provide additional funding along with local sponsors, such as banks and other engaged businesses who provide support for the local activities. Public-private partnerships are key to the effectiveness of many of the projects to ensure that resources and funding are sourced from a combination of stakeholders.

Outcomes

Microsoft's programmes in this field target mostly college and university students (mostly IT). There are three main goals:

- Contribute to technology curriculum advancement and skills development to enable the next generation of innovators.
- Events/competitions that put enterprise at the centre of the educational experience and bring together a supportive entrepreneurial ecosystem.
- Change the perception among youth and improve the capacity to start and grow businesses of the future.

Microsoft's programmes in support to entrepreneurship education have generated the following impact:

- 200, 000 students have participated globally in the 2008 Imagine Cup competition.
- Participation of 5,000 European students in the Entrepreneurship Forums to date.
- Over 3,000 start-ups in the first month since the launch have downloaded the BizSpark package.
- 1,500 students have had access to the Microsoft Business Software for Students curriculum through 30 academic institutions.
- Last year, EUGA impacted over 113,000 SMEs through the provision of grants

The benefits to Microsoft include:

- Connecting Microsoft technology with tech/innovation (but not via direct branding)
- Encouraging people to use Microsoft technology to turn ideas to businesses (DreamSpark and BizSpark)

Key Success Factors

- Responding to the local needs in the market and society in a way that reflects the core competencies and business model of the company
- A strong partner ecosystem
- Effective partnerships with a targeted sphere of stakeholders including student, academic, government and industry organizations
- A long-standing commitment to realizing potential through technology and a forward-looking vision to stimulate jobs and growth
- An industry leader in the field of education and skills development

Challenges/Barriers

- There are a variety of Microsoft initiatives so it is sometimes hard to connect them and understand the full spectrum. The Entrepreneur Forum event helps provide those connections – upon a single platform.
- It can be difficult to localize and translate content and programmes to adapt to local requirements.

- Programmes and activities must be adapted to cultural differences. Culture plays a key role. For example, in Western Europe there is less interest in starting a company while in school, while in Latin American most students are already involved in a business.
- The number of companies sustained after these programmes needs to be increased.
- Mindsets and culture need changing to increase interest in learning and becoming entrepreneurs.
- Technology needs to be viewed, not simply as a sector, but also as an enabler and a tool for realizing potential.

Lessons Learned/Recommendations for others

- Every segment of the entrepreneurial process needs to be addressed with an integrated approach and development of a vivid entrepreneurial ecosystem needs to be encouraged. This cannot be done without effective public-private partnerships to reach scale and impact.
- Projects must be based on effective stakeholder partnerships whereby core competencies are aligned to create a value chain for the beneficiary.
- Each country needs to adapt the programmes and initiatives to suit its local environment. Appropriate relationships and infrastructure must be put in place.

Future Plans

For all of the programmes, the plan is to focus on the breadth and depth of the initiative by expanding into more countries and more regions within countries and to enhance and adapt the resources on a regular basis. www.microsoft.com/citizenship

5. Overall Recommendations

KAREN E. WILSON,
GV Partners

The role of education in society is changing. No longer are schools and universities expected to stay within their ivy towers. New forms of education are emerging both within and outside of formal education systems. After school and community programmes, workplaces as well as TV, Internet and media are playing increasingly active and important roles. These multiple channels provide many opportunities to build effective approaches to delivering entrepreneurship education.

Below are a set of recommendations, which through the work on the report, have been found to be agreed upon approaches and success factors for entrepreneurship education. In addition, some remaining challenges are outlined.

Approaches

Across youth, higher education and social inclusion, there are a number approaches that are being effectively utilized and support the call to action to "mainstream" entrepreneurship education.

APPROACHES

1. Developing Leadership and Life Skills
2. Embedding Entrepreneurship in Education
3. Taking a Cross-disciplinary Approach
4. Utilizing Interactive Pedagogy
5. Leveraging Technology

1. Developing Leadership and Life Skills

The clear priority of entrepreneurship education is to focus on developing entrepreneurial attitudes, skills and behaviours. It is about developing the leaders for the society of the future and providing them with the life skills necessary for navigating in the rapidly changing world. Effective entrepreneurship education programmes focus on building self-confidence and self-efficacy, developing the practical skills necessary for students to initiate and pursue ideas, and providing students with experience in building the necessary teams to implement projects.

Entrepreneurship education should not be limited to a focus on start-ups, which is often the case in current programmes around the world. Rather it should be focused on shifting mindsets and developing skills that can be applied in many forms and entrepreneurial settings. Always important, but perhaps more so in today's environment, is the inclusion of ethics – helping students understand the importance of being responsible leaders.

" Entrepreneurship in education means developing personal qualities and attitudes as well as formal knowledge and skills: personal qualities and attitudes that increase the probability that a person will see opportunities and act upon them. Further creativity, self- confidence, resourcefulness, willingness to take risks, the ability to see the consequences of one's own actions, and the willingness and ability to come up with new solutions all help to develop an entrepreneurial attitude and conduct. Such qualities and attitudes will be useful in any work situation and in society in general, and knowledge and skills related to what is required to establish a new enterprise and how and why we succeed in developing an idea into a practical and well-structured activity."

Strategic Plan,
Norwegian Government, 2004-2008

2. Embedding Entrepreneurship in Education

Access and exposure to entrepreneurship within educational systems at all levels is important as is outreach to target audiences outside of traditional educational systems. In both respects, the role that technology can play in delivering entrepreneurship education is essential. While most students do not start or join a new business upon graduation, many do so during later stages of their careers or will contribute as an entrepreneurial employee within an organization. Therefore, exposure to entrepreneurship as well as practical training in starting and growing companies is important. Many recent reports support the call for making opportunities available to students at all levels and in all settings. At the same time, the level and background of the students, as well as the local context, need to be taken into account in shaping the programmes and curricula.

Institutional culture, practice and policies often get in the way of developing an entrepreneurial spirit and environment within educational systems. Entrepreneurship champions play critical roles, but there must also be a strong commitment from the school leadership. Traditionally, schools and universities have been focused on ensuring students can secure future employment. Today, both formal and informal school systems must prepare students to work in a dynamic, rapidly changing entrepreneurial and global environment. This requires a complete paradigm shift for academia, including changing the fundamentals of how schools operate and their role in society. It requires encouraging and supporting our educational institutions to become more entrepreneurial.

3. Taking a Cross-disciplinary Approach

The world is not divided into functional silos, so the educational process should not be either. In an increasing number of schools and universities, entrepreneurship is treated as an integral part of a multidisciplinary education process. Students are encouraged to take courses and engage in projects with students from other disciplines, enabling them to draw upon expertise from across the institution – engineering, science, design, liberal arts and business. Minimizing the institutional barriers to this cross-

fertilization, these institutions can provide a more creative and innovation learning process. There is no discipline whose students will not benefit from such an approach.

In most countries, the majority of entrepreneurship courses are offered in business schools or programmes. Entrepreneurship needs to be expanded across disciplines – particularly to the technology and science departments, where many innovative ideas and companies originate. Even on campuses with less of an interdisciplinary approach, entrepreneurship programmes are increasingly linking traditional business courses with those offered in science and technology programmes. This allows for the sharing of expertise and knowledge between the business and technical students, sparking greater innovation and facilitating technology transfer.

4. Utilizing Interactive Pedagogy

A greater emphasis is needed on experiential and action learning with a focus on critical thinking and problem solving. The pedagogy should be interactive, encouraging students to experiment and experience entrepreneurship through working on case studies, games, projects, simulations, real-life actions, internships with start-ups and other hands-on activities that involve interaction with entrepreneurs. Schools and training programmes provide a safe environment for encouraging students to stretch and test themselves, to experiment and develop an understanding of risk-taking and to turn ideas into action. It is important that students have the opportunity to experience both successes and failures – and to learn from both experiences. Most importantly, they need to learn to try, even if they fail, and then to start over and try again.

Active and learning-by-doing methods integrate elements of practice into the learning process. This highlights the importance of actively engaging entrepreneurs and other professionals in both course design and delivery. These individuals also serve as role models, particularly if they are alumni of the school, as well as coaches and mentors. They also enhance entrepreneurial spirit within the university and create stronger links between the university and the local community.

5. Leveraging Technology

In today's environment, technology plays an increasingly important role in the educational process. Many leading ICT companies, including the members of the World Economic Forum's Global Education Initiative Steering Board, are ahead of the curve on this trend, already working with school systems and teachers to leverage technology, both as a delivery channel and a teaching tool. For entrepreneurship education, this is particularly important. Not only can technology help reach larger audiences, including those who previously might not have had access to entrepreneurship education, but it can also help in the development of interactive and locally relevant programmes and materials.

Key Success Factors

Across youth, higher education and social inclusion, there are a number of key success factors that enable effective entrepreneurship education.

SUCCESS FACTORS
1. The Entrepreneurial Ecosystem
2. Developing Effective Educators
3. Curriculum Development
4. Outreach (Engagement of Business)
5. Advancing Innovation
6. Sustainable Funding

1. The Entrepreneurial Ecosystem

Entrepreneurship thrives in ecosystems in which multiple stakeholders play a role in facilitating entrepreneurship. Policy-makers at the international, national, regional and local levels all have important roles to play in setting the appropriate legal and fiscal frameworks to encourage entrepreneurship and to fill market gaps as necessary.

Educational institutions, at all levels (primary, secondary and higher education) have a critical role to play in developing the appropriate learning environment, utilizing relevant learning methods and developing educators to teach using interactive pedagogies. Higher education institutions, in particular, have a critical role to play as intellectual hubs in entrepreneurial ecosystems by serving as an incubator for innovation and research as well as a focal network for collaboration among researchers, students, professors, companies, venture capital firms, angel investors and entrepreneurs.

> *" Intel believes that entrepreneurship is crucial to building local innovation capacity. It brings new technologies to market, and supports economic development through building strong local and regional economies. Both the public and the private sectors have important roles to play in advancing entrepreneurship around the world, including through enabling effective entrepreneurship education."*
>
> Craig R. Barrett,
> Chairman of the Board, Intel Corporation

2. Developing Effective Educators

Despite the rapid growth of interest in entrepreneurship education, entrepreneurship educators still lack critical mass in schools and universities across world, not to mention in the informal educational systems. The current pool of entrepreneurship teachers should be expanded. Growing the base of experienced educators not only means providing the necessary training and education, but also requires expanding the definition of educators beyond professors to include entrepreneurs, alumni, business professionals and even students. Entrepreneurs and others with entrepreneurial experience should be allowed, encouraged and trained to teach. They not only provide great value in the classroom, but they also enhance entrepreneurial spirit within the institution overall and create stronger links with the local community and ecosystem.

Using active learning methods is more complex than traditional teaching methods. It requires engaging students' feelings and emotions in the learning process and developing the creativity, innovation and critical thinking skills of individuals. Educators/facilitators therefore must be able to create an open environment of trust in which students develop the necessary confidence to take

risks by learning from trial experiences with both successes and failures. The proper incentives, assessment, rewards and recognition must be put in place to encourage educators to try these approaches.

3. Curriculum Development

The proliferation of entrepreneurship programmes around the world has been positive in terms of validating interest in the field, but more depth and rigor is needed to ensure that entrepreneurship courses, materials and research are of high quality. Research and curriculum development are of particular importance in helping to ensure entrepreneurship's rightful place among the academic disciplines. This requires curricula that focus on learning "for" rather than "about" entrepreneurship. Students also need to learn how to manage and grow enterprises, not just how to start them.

Entrepreneurial learning must be deeply embedded into the curriculum to ingrain a new entrepreneurial spirit and mindset among students. In many countries around the world, entrepreneurship tends to be offered in stand-alone courses rather than being integrated in the content of courses in other departments or disciplines. Entrepreneurship also remains primarily elective or extracurricular at many schools and universities.

4. Outreach (Engagement of Business)

Entrepreneurship education should be very closely linked with practice. Educators should be encouraged to reach out to the business community and integrate it into the learning process. Outside speakers and case studies provide role models for students considering an entrepreneurial career path. This is an important part of creating entrepreneurial drive: if students see that people "like themselves" were able to successfully create companies, it helps to demystify the process and make that option more feasible.

More local case studies, featuring entrepreneurs discussing their successes and failures as well as challenges they faced in the process, need to be developed and shared broadly. This is particularly important for those outside of formal education systems. More could also be done to profile these entrepreneurs in the media to create a broader exposure to such role models.

In most countries, universities are government funded and, in many cases, lack the incentives to initiate proactive outreach with the private sector. Government-funded universities tend to have very traditional structures making it more difficult to integrate new approaches. University-business collaborations are an essential element of the entrepreneurial university and are founded on mutually-beneficial relationships. This is a major policy thrust of the European Commission and is a new government approach in the United Kingdom, where university enterprise networks are being established.

5. Advancing Innovation

Innovation and R&D spur economic growth, competitiveness and employment, notably in high-tech, high-skilled and high-value areas of the economy. A number of institutes and universities around the world provide some of the finest engineering, technology and science training; however, the commercialization of R&D is still in its infancy. More needs to be done to encourage links between academia and the private sector, as well as the sharing of best technology transfer practices.

To foster technology transfer, scientific and technical institutes and universities should include modules on entrepreneurship; these would enhance awareness within the research community of the opportunities and modalities that exist to commercialize innovative R&D. Links with business school students and faculty as well as with the business community should also be encouraged. Venture capital firms can and are beginning to play a more important role in working with technical universities to structure and fund spin-outs.

Nurturing centres of R&D excellence is important as well. This includes attracting and retaining the most talented PhDs from around the world. For any country to realize its global competitive potential, it will need to create a full

ecosystem revolving around attracting and retaining the most talented researchers; encouraging links between universities and the private sector; enlarging the flow of technology transfers supported by efficient and effective intellectual property rights; and creating schemes to specifically support young innovative companies at the cutting edge of development (EVCA, 2005).
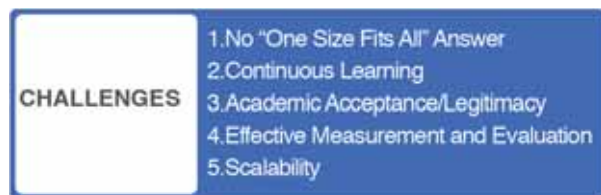
6. Sustainable Funding

In most countries, the bulk of the funding for schools and universities still comes from governments, although this is beginning to change as companies and foundations have begun to contribute. There are a few examples of entrepreneurs funding centres or chairs, but this is still relatively rare outside of the US. In general, most alumni around the world do not feel strong ties to their own schools and universities, which are still seen as the realm of governments. There needs to be a stronger culture of "giving back", which requires that schools track and engage alumni. Engagement of the private sectors also should be further encouraged.

It is clear that public interventions have affected the behaviour of schools, universities and educators, increasing the focus on entrepreneurship education. The field of entrepreneurship education is still relatively young and it is therefore important and necessary that this support is continued until entrepreneurship is embedded in a sustainable manner in schools and universities and supported through informal education systems. Efforts to communicate with policy-makers about the need, benefits and possible actions to take to encourage and support entrepreneurship education should be increased. At the same time, too much start and stop financing should be avoided, and plans for making the programmes sustainable should be considered and integrated from the start. This requires a shared vision by all stakeholders of the desired outcomes at the policy level.

Challenges

A number of challenges remain across entrepreneurship education for youth, higher education and social inclusion.

CHALLENGES
1. No "One Size Fits All" Answer
2. Continuous Learning
3. Academic Acceptance/Legitimacy
4. Effective Measurement and Evaluation
5. Scalability

1. No "One Size Fits All" Answer

There is no "one size fits all" solution for entrepreneurship education. The challenges and opportunities for entrepreneurship vary dramatically in different parts of the world as well as for different segments of the educational journey. It is therefore not possible to take only one approach. Given the multifaceted nature of entrepreneurship, educational programmes must also be multifaceted. Nor is it possible to import models from other parts of the world without modification. Local context must be taken into account in devising and tailoring a set of programmes and initiatives relevant for each area. In countries, regions, cities and towns around the world where entrepreneurship education is most prevalent, often this is the result of many different approaches and actors playing various roles, whether individually or through multistakeholder partnerships.

2. Continuous Learning

Entrepreneurial learning models, knowledge and good practice across sectors and national borders need to be better shared. There are many new models being tested around the world, both inside and outside of formal educational systems. These models need to be shared more broadly to fuel new and more effective approaches to entrepreneurship education.

Within the formal education system, more must also be done to facilitate faculty and teacher collaboration, exchanges and research across borders. While collaboration may be strong between schools within a given country, there is a large gap in cross-border activities. Currently, networks and working relationships between faculty who teach entrepreneurs are limited and there is little sharing of good practice.

Greater mobility and exchange of experience between educators is needed, not only between schools and universities but also between academia and the business world. Programmes need to be developed that allow educators to spend a significant amount of time at other institutions and/or in the private sector to truly engage, learn and grow.

3. Academic Acceptance/Legitimacy

Another issue is the acceptance of entrepreneurship within academia more broadly. While entrepreneurship is still not fully accepted as an academic discipline, many schools and universities have created niches in this area. A growing numbers of universities are offering "concentrations" or "majors" in entrepreneur-ship, many have academic entrepreneurship departments and a large percentage is offering entrepreneurship courses.

However, entrepreneurship is still trying to find its home. Faculty champions of entrepreneur-ship often have to fight internal battles for support and funding of their activities. Efforts are often fragmented and driven by external actors instead of by the education system itself (European Commission, 2002).

4. Effective Measurement and Evaluation

Greater clarity is needed regarding the purpose and goals of entrepreneurship education. These should be based on a broadly defined set of outcomes, not only on narrow measures such as the number of start-ups created. Measures need to not only cover short-term results, but also medium- and longer-term results. It also needs to be cross-country, including as many countries and regions as possible. To date, much of the existing data is from the US and Europe, even though entrepreneurial activity could actually be higher in many other parts of the world. As each of the three main chapters cover, measurement is still one of the biggest challenges in entrepreneurship education and one we hope will be addressed as a result of the report.

5. Scalability

While an increasing number of entrepreneurship education programmes exist today compared to a decade ago, scalability and penetration remain key challenges.

Technology provides a mechanism for reaching greater economies of scale as well as providing greater access. At the same time, given the explosion of activity in this field, educators and providers struggle to take advantage of the growing body of knowledge and experience that exists. It is not easy to find the right information at the right time about other programmes and initiatives that one might leverage and/or approach as partners. Again, technology can help provide solutions. Additionally, the system is not yet developmental across the key parts of education – from primary, through secondary to tertiary. This is an area beginning to receive attention but in which much more work is needed.

5.1 Recommended Actions for Key Stakeholders

To prepare for educating the next wave of entrepreneurs, entrepreneurial individuals and entrepreneurial organizations, actions are necessary at the international, national, regional and local levels. All sectors have a role to play. Policy-makers, academic institutions, the business community and other key stakeholders need to work together to seize this opportunity to fuel the engine of the economy's future growth and to improve social well-being by preparing young people to thrive and succeed in a globally competitive and dynamic world.

Governments should encourage and support entrepreneurship education, both in the formal school systems as well as in various informal education channels. This includes supporting programmes to train teachers and other educators (including business people and entrepreneurs) to teach entrepreneurship. As the report outlines, the teaching methods required to teach entrepreneurship effectively are dramatically different from traditional lecture-based teaching methods.

Educational institutions at all levels, primary, secondary and tertiary, need to embrace entrepreneurship education and embed it into not only the curriculum but, perhaps more importantly, into the way they operate and teach. Most school systems around the world are government owned and/or financed. Teaching materials and methods

are based on tools and techniques from the last century. The entire system needs revamping or a reboot to adjust to the needs of the society of the future. Sticking to the status quo is dangerous. We need to challenge ourselves and our institutions to address the needs of the future, not those of the past.

Educators themselves need to have more mechanisms to learn and share with each other, particularly since the field of entrepreneurship is still relatively new in many educational institutions and, unlike in other disciplines like math or science, there is not a set, agreed-upon curriculum or quality standard.

Entrepreneurship education also needs to extend more effectively beyond educational systems – many effective models are being developed by foundations, community organizations, NGOs, etc. These efforts should be supported and encouraged. The use of technology and media tools is also critical but needs to be coupled with the development of locally relevant content.

The development of online educational games to engage young people in entrepreneurship is an important new and developing area.

Entrepreneurship education is not an "extra" or a "nice to have." It is not an option. It is a necessity in today's world. We need ubiquitous entrepreneurship and innovation – it should not be limited to those who actually start companies. It needs to permeate society and our way of operating.

" To promote entrepreneurship we must create a better culture for innovation and creativity, and to accomplish this, we must focus on our young. Children and young people must gain confidence in their own creative powers and the ability to see and use local resources as the basis for developing businesses and employment. They must be given the opportunity to see and experience how creativity, personal confidence, drive and the ability to cooperate are vital underpinnings of entrepreneurship and also the basis for being constructive, creative and active at school and home, and at work and play."

Strategic Plan,
Norwegian Government, 2004-2008

Recommended Actions for Governments

It is clear that public interventions have affected the behaviour of schools, universities and educators, increasing the focus on entrepreneurship education. The field of entrepreneurship education is still relatively young in many parts of the world and it is therefore important and necessary that this support is continued until entrepreneurship is embedded in a sustainable manner in schools and universities. Efforts to communicate with policy-makers about the need, benefits and possible actions to take to encourage and support entrepreneurship education should be increased.

Transform the Educational System

1. Develop ambitious national plans for entrepreneurship education at all levels: primary, secondary and higher education (example: Norway)

2. Create working groups to bring together players from different ministries involved in entrepreneurship education (entrepreneurship often cuts across several ministries: education, economy, research and technology, etc.) to develop coordinated solutions and approaches

3. Encourage the creation of public or private agencies and/or foundations to support and foster entrepreneurship education

4. Work with leadership in educational institutions:
   - Agree on shared outcomes, targets and measures linked to funding mechanisms

5. Reassess the rules and regulations for academia:
   - Recognize and accept teaching by practitioners
   - In undergraduate education, recognize entrepreneurship as a legitimate career path
   - Create appropriate rewards and recognition

Build the Entrepreneurial Ecosystem

1. Provide the appropriate regulatory framework for:
   - Start-ups
   - Growth firms
   - Employment contracts
   - Intellectual property and transfer
   - Risk taking (bankruptcy laws)

2. Support the local physical infrastructure necessary for entrepreneurship education.

3. Ensure a consistent and adequate level of funding for entrepreneurship education programmes:
   - Provide tax incentives, including those to encourage donations to universities to support entrepreneurship programmes
   - Provide resources (and seek private-sector matching) to help fund entrepreneurship teaching and research
   - Ensure that the initiatives funded are sustainable and provide the necessary funding to reach sustainability
   - Encourage the development of local angel and venture capital funds

4. Support training programmes of educators (professors, teachers, practitioners, students):
   - Using interactive pedagogies
   - Developing new and relevant course materials
   - Focusing on the critical "how-to" of becoming leaders in entrepreneurship education

- Building career development and accreditation opportunities

5. Provide support to encourage the sharing and exchange of practice:
   - Facilitate the sharing of good practice across institutions and borders, both within regions and internationally
   - Create opportunities for professors and researchers from various countries to work together on projects
   - Provide support for international mobility and exchanges of educators and researchers

6. Provide support for the development of entrepreneurship course materials and case studies

7. Encourage the development of social capital/ecosystem networks:
   - Support organizations providing linkages and networking events

Strive for Effective Outcomes and Impact

1. Work with academia and other stakeholders to develop appropriate measurement and evaluation of the impact of entrepreneurial institutions, not just outputs, of entrepreneurship programmes:
   - Support longitudinal studies and data collection
   - Develop measures that take the specific programme goals, local market needs and context into account

Leverage Technology as an Enabler

1. Support the ICT infrastructure necessary for entrepreneurship education:
   - IT-broadband, telecommunications

2. Support the development of technology as both a tool and delivery method for entrepreneurship education (and education in general), not only for entrepreneurship per se, but also for leadership and personal development:
   - Computers in schools and community centres
   - Development of online training materials relevant in the local context

Recommended Actions for Academic Institutions

Most initiatives are led by individual champions, whether inside or outside the academic institution, but a commitment is also needed from the highest levels of the school or university.

Transform the Educational System

1. Engage schools and university leaders in actions to gain their commitment to reshaping the institutional paradigm: institutional vision, policies and outcomes, structures, values and rewards

Build the Entrepreneurial Ecosystem

1. Encourage all faculties/disciplines to develop opportunities for students at every level to experience entrepreneurship. Integrate entrepreneurship into the curriculum and build towards a multidisciplinary learning environment:
   - Increase the number of schools offering entrepreneurship courses, programmes and activities
   - Augment the number entrepreneurship courses, programmes and activities and make them available to a broader group of students
   - Make entrepreneurship a required course
   - Integrate entrepreneurship across other disciplines
   - Encourage entrepreneurship across disciplines, particularly in science and technology
   - Build projects and programmes across disciplines
2. Encourage the use of interactive teaching methods:
   - Promote the application of "learning by doing" through project-based learning, internships and consulting
   - Leverage the uses of case studies for discussion-based learning
   - Develop the proper incentives, assessment, rewards and recognition to encourage educators to try these approaches
   - Involve entrepreneurs and companies in entrepreneurship courses and activities
3. Broaden and build a strong pipeline of entrepreneurship professors and teachers:
   - Hire more professors and teachers fully dedicated to entrepreneurship

- Recruit professors and teachers who have entrepreneurship experience
- Support workshops and training programmes for teachers
- Provide training for entrepreneurs, business people and other practitioners to become effective educators
- Develop appropriate incentives and celebrate successes
- Review regulations on the participation of entrepreneurs, business people and others in teaching activities
- Encourage the development of specialized entrepreneurship doctoral programmes

4. Encourage the sharing of best practices among teachers and across institutions and countries.
5. Support the development of course materials (books, cases, online games, videos, etc.), not only for entrepreneurship per se, but also for leadership and personal development
6. Engage a diverse body of students in existing offerings and provide support and facilities allowing students to develop their own initiatives, through clubs, laboratories, etc.
7. Reach out to and engage the business community, public sector and other players in the ecosystem
8. Encourage the use of alumni, entrepreneurs and other practitioners in the classroom
9. Facilitate spin-outs from technical and scientific institutions:
   - Advance core research and innovation
   - Accelerate the application of science and technology to market through technology transfer offices and/or other mechanisms
   - Establish stronger links between academia, business and entrepreneurs
   - Facilitate the provision of direct training and/or support programmes for entrepreneurs in the process of starting companies
   - Provide the appropriate training for staff, particularly in the area of technology transfer
   - Ensure the time (sabbaticals, if necessary) for faculty to engage in entrepreneurial activities

Strive for Effective Outcomes and Impact

1. Develop a clear framework of desired outcomes of entrepreneurship education by:
   - Developing individual capabilities, attitudes, and mindsets
   - Encouraging application of those capabilities (as evidenced through start-ups and other ventures)
   - Contributing to economy/society
2. Create effective measures and track those over the long-term to understand the impact of entrepreneurship education
3. Ensure a consistent and adequate level of funding for entrepreneurship education programmes:
   - Provide resources (and seek public and private sector matching) to help fund entrepreneurship teaching and research
   - Provide the necessary funding to reach sustainability
   - Encourage the development of local angel and venture capital funds
4. Set high-quality standards for entrepreneurship curricula and research:
   - Encourage the development of research on entrepreneurship as well as the field of entrepreneurship education
   - Ensure research and teaching covers all of the entrepreneurial growth phases, not just the start-up phase
   - Develop high-quality local content, case studies and course materials
   - Facilitate the development of high quality, locally relevant materials
   - Create degree programmes, consistent with those at an international level
   - Promote entrepreneurship as a legitimate academic discipline

Leverage Technology as an Enabler

1. Support the development of technology as both a tool and delivery method for entrepreneurship education (and education in general), not only for entrepreneurship per se, but also for leadership and personal development:
   - Computers in schools and community centres
   - Development of online training materials relevant to the local context

Recommended Actions for Companies

Companies, and especially entrepreneurs, have an important role to play in developing entrepreneurship education.

Transform the Educational System

1. Encourage governments and academia to make entrepreneurship education a key priority for the education agenda in both formal and informal education and all age levels
2. Encourage mutually-beneficial business-university collaborations

Build the Entrepreneurial Ecosystem

1. Support the development of entrepreneurship within schools and universities by providing resources for professorships/chairs, educators, institutes and entrepreneurship centres
2. Engage with academic institutions as well as other organizations providing entrepreneurship training by providing expertise, teaching and mentoring:
   - Encourage the involvement of employees (as speakers, mentors, role models)
   - Exchanges of academic and company staff
3. Participate actively in the ecosystem, providing and sharing social capital
4. Partner with other stakeholders in the ecosystem to launch specific initiatives to develop effective programmes and processes for entrepreneurship education:
   - Forums and events
   - Training and/or mentoring entrepreneurs and students
   - Training faculty
   - Competitions and awards
   - Accelerators, incubators, labs
   - Entrepreneurship centres/institutes
   - Curriculum development
   - Online educational and training tools
   - Global exchange networks
5. Encourage programmes that target underdeveloped or underserved groups such as women, minorities, disadvantaged or disabled people
6. Share knowledge and capabilities with NGOs and other organizations that support entrepreneurs. This indirectly promotes entrepreneurship education by supporting the

capacity of organizations that develop entrepreneurs. In so doing, it enables such organizations to operate more effectively, thereby increasing their impact on the entrepreneurial educational process

Strive for Effective Outcomes and Impact

1. Work with academic institutions, governments and others to develop more effective measurement tools
2. Provide funding for research on the field of entrepreneurship education and evaluation tools such as longitudinal studies as well as statistics

Leverage Technology as an Enabler

1. Provide expertise and partner with educators to develop effective online tools and materials for entrepreneurship education

Recommended Actions for Other Actors

These could be foundations, NGOs, quasi-government agencies, media, etc.

1. Raise awareness about entrepreneurship as well as the importance of entrepreneurship education
2. Profile entrepreneurial role models:
   - Create more public recognition vehicles for entrepreneurs through the media, awards, etc.
   - Develop and share stories and case studies profiling successful entrepreneurs
3. Engage the media to share these stories more broadly as well as to change the mindset about entrepreneurship and entrepreneurs, particularly in countries or regions in which there are negative perceptions
4. Leverage existing networks offering good practice in entrepreneurship education
5. Create mechanisms for sharing practices and research not only through conferences and meetings but also through online sites or wikis which can be updated directly by those active in the field
6. Encourage the development of innovative new tools and approaches for entrepreneurship education
7. Develop and support programmes that target underdeveloped or underserved groups such as women, minorities, disadvantages or disabled people

The above recommendations attempt to outline some of the actions that can be taken by various stakeholders. Champions are needed at all levels and in all sectors. Both bottom up and top down approaches are necessary for different elements of the process. No one actor in the ecosystem can address these challenges on its own. Multistakeholder partnerships are essential for building the commitment and addressing the broader set of issues necessary for creating and sustaining a more entrepreneurial society. Capacity building is therefore important for all players, not just entrepreneurship educators. In that regard, policy-makers, academic leaders and even the media can benefit from entrepreneurship training.

There is no "one size fits all" answer. Context matters. The challenges and opportunities for entrepreneurship vary dramatically in different parts of the world. It is therefore critical that the local context is taken into account and that the relevant local players are engaged in the process.

Recommendation Matrix

Actions: / Actors:	POLICY MAKERS	SCHOOLS	UNIVERSITIES	EDUCATORS	COMPANIES ENTREPRENEURS	FOUNDATIONS	NGOs	MEDIA	STUDENTS
TRANSFORM THE EDUCATIONAL SYSTEM									
Embedded Strategy	✓	✓	✓	✓	✓	✓	✓		
Establish Coordinating Bodies	✓	✓	✓	✓	✓	✓	✓		
Embed Within Existing Bodies	✓	✓	✓		✓	✓	✓		
Change Rules and Regulations	✓	✓	✓						
BUILD THE ENTREPRENEURIAL ECOSYSTEM									
Funding	✓	✓	✓		✓	✓	✓		
Infrastructure Development	✓	✓	✓	✓	✓	✓	✓		
Capacity Building	✓	✓	✓	✓	✓	✓	✓		
Support Curriculum Development	✓	✓	✓	✓	✓	✓	✓		
Build Networks/ Social Capital	✓	✓	✓	✓	✓	✓	✓		✓
Share Practices & Information	✓	✓	✓	✓	✓	✓	✓	✓	✓
Facilitate Academia-Business Outreach	✓	✓	✓	✓	✓	✓	✓		✓
Awareness Raising	✓	✓	✓	✓	✓	✓	✓	✓	✓
STRIVE FOR EFFECTIVE OUTCOMES AND IMPACT									
Develop Effective Measures	✓	✓	✓	✓	✓	✓	✓		
LEVERAGE TECHNOLOGY AS AN ENABLER									
Leverage Technology	✓	✓	✓	✓	✓	✓	✓	✓	✓

6. Conclusions

KAREN E. WILSON,
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Entrepreneurship and entrepreneurial skills are core components to building socially inclusive and highly participatory economies in an increasingly global and competitive world. While this report highlights and raises awareness of the importance of entrepreneurship education in spurring economic growth and achieving the Millennium Development Goals, it also urges action.

The report consolidates existing knowledge and good practices in entrepreneurship education around the world to enable the sharing and development of innovative new tools, approaches and delivery methods. It also provides recommendations to governments, academia and the private sector on the development and delivery of effective education programmes for entrepreneurship. This is only the beginning – the launch of a process in which the recommendations can be discussed on the global, regional, national and local levels and implemented with the involvement of key stakeholders.

Innovation and economic growth depend on being able to produce future leaders with the skills and attitudes to be entrepreneurial in their professional lives, whether by creating their own companies or innovating in larger organizations. Entrepreneurship education is the first and arguably the most important step for embedding an innovative culture and preparing the new wave of entrepreneurs, entrepreneurial individuals and organizations.

The entrepreneurial movement is well underway. There is a high and growing level of interest in entrepreneurship from students, faculty, university administrators, employers and policy-makers, as well as an increasing number of initiatives throughout the world. The moment is right for a significant evolution of entrepreneurship education. We cannot determine today the exact nature of the next wave of entrepreneurship, however, we do know that it will require more creative, innovative and entrepreneurial attitudes, skills and behaviours.

This report is meant to be a catalyst and call for action on entrepreneurship education. We need to learn from models around the world and focus on integrating the most relevant and high quality practices into the context relevant for each country and region. This should be a long-term commitment, however, not one that starts and then stops a few years later. Sustainability is a key issue. That means the objectives of entrepreneurship education should be clear from the start and outcomes should be measured to ensure that the intended results are being delivered.

The findings of the full report will be shared through the World Economic Forum regional summits and other leading international fora during the course of 2009, with the goal of deepening the findings at the regional and local levels and initiating concrete actions that can advance entrepreneurship education as a critical component for addressing the global challenges of the 21st century.

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Executive Summary, Recommendations, Steering Board Case Studies, Consolidation of Full Report

Karen E. Wilson

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Karen Wilson is the founder of GV Partners, a firm she created in 2004, and also works as a Senior Fellow at the Kauffman Foundation. She has focused on entrepreneurship education, policy and financing (venture capital), working with private sector firms, international organizations, foundations and universities, primarily in Europe. She has authored several papers on these topics and has also served as an advisor on the recent European Commission Survey on Entrepreneurship in Higher Education.

Prior to founding GV Partners, Karen worked in the venture capital industry. Previously, she was part of the senior management team at the World Economic Forum in Geneva, Switzerland and, before that, served as the Executive Director of the Global Initiative at Harvard Business School. Her past experience also includes management consulting, primarily in financial services, as well as investment banking.

Karen has served on a number of boards and coached many start-ups. She currently serves as an advisor and board member of the European Foundation for Entrepreneurship Research (EFER), an advisory board member for the United Nations (UNCTAD) EMPRETEC programme and is a member of the European Leadership Council for Harvard Business School.

Karen received a Bachelors of Science Degree (with honours) in Mathematics and Management from Carnegie Mellon University and an MBA from Harvard Business School.

Chapter on Youth

Steve Mariotti

Founder and President, The National Foundation for Teaching Entrepreneurship (NFTE), US.

Considered one of today's leading experts in education for at-risk youth, Steve changed career paths in 1982 when he decided to move from the corporate sector and become a special education teacher in the New York City school system. Steve's first assignment was in the East New York section of Brooklyn, and his last was in the Fort Apache section of the South Bronx. While teaching in this hard-hitting environment for six and one-half years, Steve gained insight into how to successfully motivate his tough students – teaching them how to run a business. His perceptions and learnings inspired him to create a program to bring entrepreneurial education to low-income youth. In 1987, the National Foundation for Teaching Entrepreneurship (NFTE), a section 501(c)(3) non-profit organization, was formed.

Now, almost 20 years later, NFTE's mission is to teach entrepreneurship and help youth from low-income communities become economically productive members of society by improving their academic, business, technological, and general life skills. The programme has a proven track record of success. It is frequently used as a model for other programmes to teach business knowledge and the resulting business formation. NFTE has reached over 150,000 young people since its founding and has programs in 28 states and 13 countries outside the United States.

Mariotti is the recipient of numerous awards including an Ernst & Young Entrepreneur of the Year Award, the National Director's Entrepreneurship Award from the Minority Business Development Agency of the US Department of Commerce, the Association of Education Publishers' Golden Lamp Award, the ACE/Currie Foundation Humanitarian Venture Award, America's Top High School Business Teacher, and most recently, the Bernard A. Goldhirsch Award for Entrepreneurial Advocacy. He has been the subject of many national media profiles including ABC Evening News and

20/20. In addition, he is the co-author of eight books on entrepreneurship. NFTE is an active member of the Council on Foreign Relations. Mariotti has attended The World Economic Forum and has been a frequent speaker at the Annual Meeting as well as other business forums.

A native son of Flint, Michigan, Mariotti received his BBA. in business economics and his MBA from the University of Michigan, Ann Arbor. He has also studied at Harvard University, Stanford University and Brooklyn College. He started his professional career as a treasury analyst for Ford Motor Company before founding his own company, Mason Import/Export Services.

Daniel Rabuzzi

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Daniel A. Rabuzzi is Chief of Staff at the National Foundation for Teaching Entrepreneurship (NFTE), the leading provider of entrepreneurship education for youth (www.nfte.com), having previously been NFTE's Director of Sales and National Director of Programs.

Previous positions include CEO of the Leader to Leader Institute (formerly the Peter Drucker Foundation for Non-profit Management), CEO of the Kentucky Virtual University and Vice-President for Economic Initiatives at the Kentucky Council on Postsecondary Education, and Vice-President in international ship finance at Manufacturers Hanover Trust Company (NYC) and its start-up subsidiary in Oslo, Norway.

In these roles, Daniel led customer-facing teams with annual operating budgets up to US$ 10 million and P & L responsibility. He planned and participated in two entrepreneurial start-ups: the new bank subsidiary in Norway, and the virtual university within the Council (the virtual university quadrupled the number of learners served in 30 months to 16,000).

As a banker, most of his clients were entrepreneurs and founders of companies. He initiated and managed multiple-partner collaborations and strategic alliances in both the public and private sectors. He managed the design, testing and deployment of several enterprise-wide learning management systems and management information systems.

Daniel has significant experience in education, as a professor, administrator and policy advisor. Among other initiatives, he has designed, developed, launched, and/or expanded 32 for-credit programs and 49 professional development/continuing education modules, and has managed curricular and teacher training development in a national multiple-site system. He earned his PhD in history at Johns Hopkins. He also holds an MA in international business from The Fletcher School at Tufts University, and his AB from Harvard. In addition, he spent several years as a graduate fellow at the University of Oslo and at the University of Bielefeld, and has conducted research in the UK, the Netherlands, France, Germany, Norway, Denmark and Sweden.

Daniel won a silver award from the Society of National Association Publications for a 2005 cover story in American Society of Association Executives journal, and has had 15 other professional articles published. He was a senior editor of Leader to Leader journal. He has spoken at many venues including at the Harvard Kennedy School, the University of Michigan Ross School, the Net Impact National Conference at Columbia Business School, the NYU Stern School Nonprofit Association, the Executive Women International national leadership meeting, the Sloan Foundation Symposium, the National Governors Association, the Pew Symposium, the Southern Regional Education Board, the DoSomething national boot camp, the Education Pioneers summer workshop and the American Society of Trainers & Developers.

He is a three-time judge at NYU's Reynolds Graduate Fellowship in Social Entrepreneurship selection event, and a two-time evaluator for the Echoing Green Foundation Fellowships competition.

Outside work, he has had four short stories published and his first novel accepted for publication in 2009. He is a lifetime competitive distance runner. Daniel comes from a family of entrepreneurs, and his wife Deborah Mills (www.deborahmillswoodcarving.com) is an entrepreneur.

Chapter on Higher Education

Christine Volkmann

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Volkmann studied Economics at Gießen University
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Volkmann worked for Deutsche Bank where she held
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From April 1999 until August 2008, Volkmann worked as a
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Her research and teaching activities focus on Responsible
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Chapter on Social Inclusion

Shailendra Vyakarnam

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Shai is Director for the Centre for Entrepreneurial Learning.
He started his working career in small companies, leaving
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Management, where he stayed on the faculty for ten years,
before taking up a Chair in Enterprise at Nottingham
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In 1990 Shai, co-founded Transitions, combining his
academic interests with the practical 'how-to' for
businesses. He has worked with over 400 businesses in
workshops, consulting assignments and as coach, mentor
and non-executive director.

Shai is on the editorial board of the International Small
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