

Entrepreneurship in higher education, especially within non-business studies

Final Report of the Expert Group





EUROPEAN COMMISSION
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Promotion of SMEs competitiveness
Entrepreneurship

BEST PROCEDURE PROJECT:

**“ENTREPRENEURSHIP IN HIGHER EDUCATION, ESPECIALLY IN
NON-BUSINESS STUDIES”**

FINAL REPORT OF THE EXPERT GROUP

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EXECUTIVE SUMMARY

If it is to make a success of the Lisbon strategy for growth and employment, Europe needs to stimulate the **entrepreneurial mindsets** of young people, encourage innovative business start-ups, and foster a culture that is friendlier to entrepreneurship and to the growth of small and medium-sized enterprises (SMEs). The important role of **education** in promoting more entrepreneurial attitudes and behaviours is now widely recognised.

However, the benefits of entrepreneurship education are not limited to start-ups, innovative ventures and 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.

The **Bologna process** can have a positive effect on the way entrepreneurial knowledge is spread. The 46 Bologna signatory countries met in London in May 2007, and recommended such measures as the recognition of non-formal learning, the development of flexible curricula to accommodate student and staff mobility, and enhanced university-employer collaboration in innovation and knowledge transfer.

At higher education level, the primary purpose of entrepreneurship education should be to **develop entrepreneurial capacities and mindsets**. In this context, entrepreneurship education programmes can have different objectives, such as: a) developing entrepreneurial drive among students (raising awareness and motivation); b) training students in the skills they need to set up a business and manage its growth; c) developing the entrepreneurial ability to identify and exploit opportunities. Graduates' start-up is one of a range of possible outcomes.

Currently the teaching of entrepreneurship is **not yet sufficiently integrated** in higher education institutions' curricula. Available data show **that the majority of entrepreneurship courses are offered in business and economic studies**. The diffusion of entrepreneurship is particularly weak in some of the Member States that joined the EU in and after 2004.

However, it is questionable whether Business Schools are the most appropriate place to teach entrepreneurship: innovative and viable business ideas are more likely to arise from **technical, scientific and creative studies**. So the real challenge is to build **inter-disciplinary** approaches, making entrepreneurship education accessible to all students, creating teams for the development and exploitation of business ideas, mixing students from economic and business studies with students from other faculties and with different backgrounds.

The demand for learning about entrepreneurship is increasing. However, there is a **shortage of human resources and funding** for this type of education; therefore it is not possible to meet this demand fully. Action-oriented teaching is labour-intensive and costly, and requires specific training.

There are currently **too few professors** of entrepreneurship. There is a need to graduate enough PhD students in entrepreneurship who can become teachers. Moreover, there is **very little in terms of incentives** to motivate and reward teachers for getting involved in entrepreneurial teaching and interaction with students. It is currently difficult to build a career in entrepreneurship, as research remains the main promotion criterion.

Developing and delivering entrepreneurship is significantly affected by the **internal organisational structure** of an institution. **Faculties and departments tend to work quite separately**, with many obstacles for students who want to move and for teachers interested in establishing cross-disciplinary courses. A rigid curriculum structure is often an impediment to inter-disciplinary approaches.

In terms of **specific contents**, programmes and courses should be adapted to **different target groups** (by level: undergraduate, graduate, post-graduate, PhD; by field of study: economics/business, scientific/technical studies, humanities, arts & design, etc.). The best way to encourage entrepreneurship among students is by **giving examples from the relevant technical area**.

As regards current teaching methods, there are a wide range of techniques to supplement lectures as the most basic teaching tool. However, there seems to be a **gap between the methods actually used and those that are viewed as the most effective** and appropriate.

Using experience-based teaching methods is crucial to developing entrepreneurial skills and abilities. **Traditional educational methods** (like lectures) **do not correlate well with the development of entrepreneurial thinking**.

There is a need for **more interactive learning approaches**, where the teacher becomes more of a moderator than a lecturer. Crossing boundaries between disciplines, and **multi-disciplinary collaboration**, are essential elements in building enterprising abilities.

Getting **real entrepreneurs** involved in the teaching can make up for the current lack of practical experience among professors. Although **entrepreneurs and business practitioners are in general involved in the teaching**, there are few examples of entrepreneurial practitioners engaged in the full curricula experience. Most frequently, they come to give short presentations to students (e.g. as personal testimonials or guest lecturer) or as judges in competitions. European higher education institutions are not sufficiently involved and effective in **working with alumni** who have been successful in their entrepreneurial endeavours, and who could bring back knowledge and funds.

Also, **mobility of teachers and researchers** between higher education institutions and business is in general very low, and this practice is not actively encouraged. There are in many cases few or no incentives, and in some cases outright disincentives. For instance, lecturers may be banned from engaging in external commercial activities.

The strength that gives higher education institutions an innovative capacity, and hence entrepreneurial potential, is their **autonomy**. While diversity is richness, institutions and educators will gain from exchanges and mutual learning, open sources of information, examples of good practice across Europe. Coordination is needed at a **policy level** to ensure that all higher education institutions are given the necessary incentives and opportunities to take on this challenge.

This Report does not aim to prescribe a single strategy, which would be unrealistic. Its goal is rather to highlight key issues, to identify existing obstacles and to propose a range of solutions, taking into account the different levels of responsibility (public policy, institutions and educators, relevant stakeholders).

For instance, it is proposed that **public authorities** might:

- **set up a task force** (including the Ministry of Education and other ministerial departments: Economy; Employment; Science and Research) to determine how entrepreneurship can be integrated into primary, secondary, and higher education;
- adopt **legislation** supporting relations between private business and universities, including allowing professors to work part-time with business;
- help develop an **accreditation system** to validate non-formal learning and practical activities that favour entrepreneurship development;
- establish **awards for entrepreneurial universities**, teachers and students, and promote positive examples of academic spin-offs.

At their level of responsibility, **higher education institutions** could:

- set up a **strategy** and an **action plan** for teaching and research in entrepreneurship, embedding practice-based activities, and for new venture start-ups and spin-offs;
- create an **entrepreneurship education department**, which would serve as an entrepreneurial hub within the institution and spread the teaching of entrepreneurship across all other departments;
- offer an **introduction to entrepreneurship** and self-employment to all undergraduate students during their first year. In addition, give all students the opportunity to attend seminars and lectures in this subject;
- set up **incentive systems** to motivate and reward faculty staff in supporting students interested in entrepreneurship, and **acknowledge** the academic value of research and activities in the entrepreneurial field;
- develop clear institutional rules about **intellectual property**;
- **award academic credits** for practical work on enterprise projects outside the established courses.

Finally, as regards **other actors** who need to be involved:

- **Business associations** could help to get their members more involved in teaching entrepreneurship at educational establishments.
- The **European Commission** could support programmes to train entrepreneurship teachers on a European scale, and back the creation of networks and cross-border exchange programmes for educators.

Raising awareness should be one important effect of this Expert Report. So the primary beneficiaries of this project would include Ministries of Economy and Education, and the managers of higher education institutions. This work aims to **support policy and decision-making at various levels**.

1. INTRODUCTION

1.1. The importance of education for entrepreneurship

Entrepreneurship refers to an individual's ability to turn ideas into action. It includes creativity, innovation and risk taking, 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 activity¹.

If it is to make a success of the Lisbon strategy for growth and employment, Europe needs to stimulate the **entrepreneurial mindsets** of young people, encourage innovative business start-ups, and foster a culture that is friendlier to entrepreneurship and to the growth of small and medium-sized businesses. The important role of **education** in promoting more entrepreneurial attitudes and behaviours, starting even at primary school, is now widely recognised.

The **Spring European Council of March 2006** underlined the need for an overall positive entrepreneurial climate and for framework conditions that facilitate and encourage entrepreneurship, and invited Member States to introduce stronger measures, including entrepreneurship education.

Following the European Conference in Oslo in October 2006, which presented a wealth of good practice examples, the Commission published the “**Oslo Agenda for Entrepreneurship Education in Europe**”². as the idea was to set out a menu from which all stakeholders can pick items at the appropriate level.

Entrepreneurship education should not be confused with general business and economic studies; its goal is to promote creativity, innovation and self-employment, and **may include the following elements**:

- developing personal attributes and skills that form the basis of an entrepreneurial mindset and behaviour (creativity, sense of initiative, risk-taking, autonomy, self-confidence, leadership, team spirit, etc.);
- raising the awareness of students about self-employment and entrepreneurship as possible career options;
- working on concrete enterprise projects and activities;
- providing specific business skills and knowledge of how to start a company and run it successfully.

Entrepreneurial programmes and modules offer students the tools to think creatively, be an effective problem solver, analyse a business idea objectively, and communicate, network, lead, and evaluate any given project. Students feel more confident about setting up their own

¹ Commission Communication “Fostering entrepreneurial mindsets through education and learning”. COM(2006) 33 final.

² Available at: http://ec.europa.eu/enterprise/entrepreneurship/support_measures/training_education/index.htm

business as they can now test their own business ideas in an educational, supportive environment.

However, the benefits of entrepreneurship education are not limited to boosting start-ups, innovative ventures and new jobs. **Entrepreneurship is a competence for all**, helping young people to be more creative and self-confident in whatever they undertake.

The **Recommendation of the European Parliament and the Council** of 18 December 2006 on Key Competences for Lifelong Learning³ identifies the “sense of initiative and entrepreneurship” as one of eight key competences that should be put across at all stages of education and training.

Previous analysis carried out by the Commission⁴ — in cooperation with national authorities — shows that although numerous initiatives on entrepreneurship education are under way at all levels across the EU, most of them are neither integrated into the curriculum nor form part of a coherent framework, and that as a result **most students — at school and university — have no possibility as yet of taking part in entrepreneurship courses and programmes.**

Higher education is not isolated from previous levels of educations. It should reflect what is done at school. Entrepreneurship is a combination of mindsets, knowledge and skills. As mindsets take shape at an early age, entrepreneurship is something that should be fostered already at school.

Higher education is normally highly **decentralised**, but there are examples of public policy driving entrepreneurship, for instance based on cooperation between public administrations and universities. Universities and technical institutions (e.g. polytechnics) should **integrate entrepreneurship as an important part of the curriculum**, spread across different subjects, and require or encourage students to take entrepreneurship courses.

Special attention should be paid to systematically integrating entrepreneurship training into **scientific and technical studies and within technical institutions**, to facilitate spin-offs and innovative start-ups, and to help researchers acquire entrepreneurial skills. There needs to be more focus on developing the skills necessary for fully exploiting **innovation** and knowledge transfer activities in combination with the **commercialisation of new technologies**. Academic **spin-offs** are increasingly seen as important means of enhancing local economic development. However, in their new roles, scientists and universities must build business and managerial competencies⁵.

More generally, **students in all fields, including Humanities, Arts and Creative studies**, may greatly benefit from learning about — and gaining experience of — entrepreneurship. In fact, entrepreneurial mindsets, knowledge and abilities will be of benefit to young people in all walks of life and in a variety of jobs.

At higher education level, the primary purpose of entrepreneurship education should be to **develop entrepreneurial capacities and mindsets**. The way to success is to teach students

³ 2006/962/EC, OJ L394/10

⁴ “Best Procedure” Projects. Final Reports are available at:
http://ec.europa.eu/enterprise/entrepreneurship/support_measures/training_education/index.htm

⁵ Commission Communication “Fostering entrepreneurial mindsets through education and learning”. COM(2006) 33 final.

about new sources of self-employment and convince them that being a businessman or woman is one way of entering the labour market. Start-up is therefore one of a range of possible outcomes. Historically, entrepreneurship has been associated with small businesses and hence viewed as a less attractive career option for dynamic university graduates. A shift in attitudes among students can be fostered by introducing and promoting the dynamic, innovative and ambitious face of entrepreneurship.

The **Bologna process**⁶ can have a positive effect on the way entrepreneurial knowledge is spread; the result is that it is possible to compare the content of training and it becomes more straightforward for training to be recognised throughout Europe. It is much easier for students and professors to travel and to forge international contacts. The system makes it possible for European citizens to study or to make use of their qualifications, in particular those skills they have acquired during their entrepreneurship training, as employees or entrepreneurs in all of the Member States without restriction.

The 46 Bologna signatory countries met in London in May 2007. Ministers urged higher education institutions to develop partnerships and cooperation with employers in the ongoing process of curriculum innovation based on learning outcomes⁷. They also recommended such measures as the recognition of non-formal learning, the development of flexible curricula to accommodate student and staff mobility, and enhanced university-employer collaboration in innovation and knowledge transfer. These issues are addressed later in this Report.

European universities do not enjoy equal degrees of **autonomy**; the framework conditions therefore vary. It is for higher education institutions to determine the best ways forward, in the light of their degrees of autonomy, missions and contexts. It is not realistic to prescribe a unique strategy. On the other hand, **guidelines and indications of good practice** may be very helpful.

1.2. Objectives and methodology

This European project was developed under the Multiannual Programme for Enterprise and Entrepreneurship (2001-2005)⁸, by using “*Best procedure*”.

“**Best Procedure**” was set up (under a mandate from the Lisbon Council in 2000) to promote the exchange of best practice and to create synergies between existing processes. The common feature of Best Procedure projects is an analysis of issues of interest for the Commission and national administrations, with a view to gaining a better understanding of the nature of such issues, of the efforts being deployed and the identification of best practice.

The ultimate aim of the whole process is to encourage policy change in the Member States and in the other participating countries, and one of the essential features of this methodology

⁶ The Bologna Process aims to create a European Higher Education Area, in which students can choose from a wide and transparent range of high quality courses and benefit from smooth recognition procedures. The three priorities of the Bologna process are: Introduction of the three cycle system (bachelor/master/doctorate), quality assurance and recognition of qualifications and periods of study. More information is available at:

http://ec.europa.eu/education/policies/educ/bologna/bologna_en.html

⁷ London Communiqué para.3.5

⁸ Council Decision (2000/819/EC) of 20 December 2000, on the OJ L 333/84 of 29/12/2000.

is that projects are carried out jointly by the Commission and by the national administrations concerned.

This project builds on the Commission Communication “Fostering entrepreneurial mindsets through education and learning”, adopted in February 2006, and on the “Oslo Agenda for Entrepreneurship Education in Europe”, published in the wake of the European Conference organised jointly by the European Commission and by the Norwegian government in Oslo in October 2006.

An **Expert Group** was set up to run this project. National governments were asked by the Commission to designate an expert. Representatives of certain European organisations and networks active in the field were also invited to participate as Observers (*the complete list of Experts appears at the beginning of this Report*).

The Group looked at programmes and activities aimed at fostering entrepreneurial mindsets, attitudes and skills among young people and available to higher education students at **different levels**, i.e. undergraduate, graduate and postgraduate, and in **all fields of study**. Other possible targets of entrepreneurship training programmes (entrepreneurs, company executives, secondary school teachers, etc.) are not considered.

More specifically, the main **objectives** of this project were:

- to identify strengths and weaknesses in European higher education institutions, as regards offering entrepreneurship teaching;
- to investigate the most common teaching methods currently in use, and identify best practice in delivering entrepreneurship education at this level;
- to explore in depth issues related to the teaching of entrepreneurship in different fields of study;
- to evaluate how entrepreneurship education could best contribute to new start-ups and to the exploitation of business ideas;
- to gather information on existing good practice and provide concrete examples;
- to identify factors of success and main obstacles;
- to promote the exchange of experiences;
- to highlight the role of public policies and identify relevant support measures;
- to draw main conclusions and recommendations for policy action.

The **tasks** of the Group were: to bring together the necessary expertise; to provide information and data on existing programmes; to ensure cooperation with and the active involvement of the national administrations in the participating countries.

This activity was open to EU Member States, Candidate Countries and EFTA/EEA countries. In addition to **26 of the EU Member States, Liechtenstein and Norway** also decided to participate.

In addition, and the Commission launched a cross-European **Survey on Entrepreneurship in Higher Education**⁹, to provide a comprehensive picture of the teaching of entrepreneurship

⁹ OJ S — 2006/S 101-107657

in higher education institutions, both in quantitative terms (e.g. number of courses, professors and students, etc.) and in qualitative terms (teaching tools used). This survey will address entrepreneurship teaching in all types of institutions and courses (in both business and non-business studies). The results will be available after the publication of this Expert Report, and will provide a factual basis (statistical evidence) for the Expert Group's proposals.

Awareness raising should be an important effect of this Report, and of the associated Survey. In this sense, the primary beneficiaries of this project would include the Ministries of Economy/Industry and Education and the managers of higher education institutions. The action should have an impact in supporting policy and decision-making at various levels.

2. AN OVERVIEW OF THE CURRENT SITUATION IN EUROPE

In many countries entrepreneurship in non-business studies is a very new issue. In general terms, entrepreneurship is **not yet sufficiently integrated** into the curriculum of higher education institutions. The situation seems to be more positive in only few countries (such as **Germany**), while the spread of entrepreneurship is particularly weak in some of the Member States that joined the EU in and after 2004.

Data from some European countries show **that the majority of entrepreneurship courses are offered in business and economic studies** (for instance in **Spain**¹⁰ and in the **UK**¹¹, see *Tables 1 and 2 at the end of this Section*).

As a complement to the activities of the Expert Group **the Commission launched a European-wide survey** on higher education institutions, aiming to provide a complete picture of the state of the teaching of entrepreneurship in higher education. The objective of the study is to provide factual and quantitative information on the existing offer. The results of this survey are expected in the autumn of 2008, and are therefore not included in this Expert Report. However, a short summary of main developments in some of the countries participating to this work is provided below, based on the knowledge and judgment of the members of the Expert Group.

The focus of the brief analysis presented here is on the teaching of entrepreneurship within **non-business fields of study**.

Belgium

Generally speaking, there is a lack of entrepreneurship courses and teaching for non-business students in higher education. Entrepreneurship is still mostly taught within economic studies, and to some extent engineering studies. A notable initiative is an introductory course on entrepreneurship, which is organised by all universities and aims to raise awareness of entrepreneurship and self-employment. It is addressed to graduate students from all sections (business and non-business) and to researchers. The initiative has met with mild interest. Many deans of “hard-science faculties” have not included it in their programmes.

Czech Republic

There is no generally accepted system of entrepreneurship teaching in the Czech Republic. Education in entrepreneurship is running at some universities, more or less on the basis of individual approaches. Entrepreneurship teaching within technical studies is mostly limited to selected courses generally related to economics or business. In some cases the technology transfer offices of large universities are offering selected practice-oriented courses on entrepreneurship to young researchers interested in marketing their knowledge.

Denmark

In Denmark the number of entrepreneurship courses is growing, within economic, humanistic and technical studies. The Government created in 2004 the International Danish

¹⁰ Survey by the Spanish Ministry for Industry, Tourism and Trade, Directorate General for SME Policy, 2006.

¹¹ Report on Enterprise and Entrepreneurship in Higher Education, 2007 National Council for Graduate Entrepreneurship.

Entrepreneurship Academy (IDEA), entirely focused on entrepreneurship teaching in higher education (38 universities and colleges were IDEA partners, encompassing business as well as non-business institutions/faculties). Policy plans have been accompanied by a number of new initiatives generated or supported by IDEA, such as an International Master in Entrepreneurship Education and Training (starting March 2008) and a Diploma Course for Entrepreneurship Teachers, aiming at post-graduate training, particularly at college level (starting September 2008). In 2007 the new Danish Government announced as one of its policies that all students in higher education institutions should have access to courses in entrepreneurship.

Germany

The impact of entrepreneurship education in higher education institutions has been growing in recent years. At the beginning of 2008, fifty-eight working chairs in entrepreneurship were recorded, while fourteen further professorships were advertised as open positions or definitely planned. Thus the number of active chairs in entrepreneurship rocketed from one in 1998 to fifty-eight in 2008 (twenty-two in universities, six in technical universities and thirty in universities of applied sciences). In addition, there are some 40 entrepreneurship affiliated chairs which have integrated entrepreneurial aspects into their teaching. Examples are chairs of innovation/innovation management, marketing, financing and management. With the growing impact of entrepreneurship in higher education institutions, some universities in Germany become increasingly entrepreneurial themselves.

Estonia

The overall situation in Estonia — as in many other new Member States — is generally very weak. Usually non-business and technical studies include macro- and microeconomics courses. Sometimes, in addition, general courses are offered on accounting and innovation. However courses genuinely targeting entrepreneurship and business (start-up, business plan, etc) are lacking in almost all universities and all curricula. Where such courses do exist, they are usually of low quality since most faculty members do not have the requisite experience and qualifications.

Ireland

Entrepreneurship learning initiatives have been growing in demand and popularity in recent years in Ireland, and many higher education institutions are now delivering specific modules in entrepreneurship and other innovative enterprise subjects, such as new venture creation and enterprise development. These programmes are not only being delivered to business faculties, but more recently there has been an increase in the demand for and interest in entrepreneurship from faculties such as Engineering, Science, and Arts. Incorporated into many of these modules are the practical elements of new venture creation, offering students the opportunity to create business plans and work in conjunction with prominent entrepreneurs, both national and international.

Greece

Since 2000, entrepreneurship-related measures have been incorporated by the government in the new Operational Programme for education under the European Social Fund (EPEAEK II). The policy for entrepreneurship in higher education does not have a mandatory character for the institutions, but almost all of them have submitted proposals for inclusion in their educational programmes. There is also a Pan-Hellenic competition and awards for the best entrepreneurial project from students.

Spain

The creation of new businesses based on university knowledge has become a priority in Spain over recent years. Many Spanish universities have set up entrepreneur detection and recruitment programmes, with support structures that can help turn an idea developed in the academic *milieu* into a viable business venture. A survey¹² identified 52 extracurricular programmes and initiatives of this type to add to 49 curricular teaching courses. Programmes are directed at any member of the university community with a business idea, although take-up is greatest among those who have completed their studies. As part of the curriculum, around 55% of identified entrepreneurship courses take place within business and economic courses, compared to 21% in technology and 19% in social studies.

France

Any overview of the situation needs to consider separately the two key components of higher education in France: “*Grandes Ecoles*” and universities. In very general terms, the “*Grandes Ecoles*” appear to be more advanced than universities in teaching entrepreneurial attitudes and business creation. At university, the situation is changing for the better in scientific higher education, but things are moving more slowly in other non-economic disciplines. Two specific initiatives can be quoted: the creation of nine polytechnic schools within universities with entrepreneurial teaching; and the “house of entrepreneurs” in a few universities, offering entrepreneurial courses to students. As regards professors, initiatives have been taken to develop exchange, training and research activities (“*Académie de l’Entrepreneuriat*”). Pedagogical experiences and tools in entrepreneurship are collected and disseminated through a national database (OPPE). The government is currently working on new initiatives to develop entrepreneurship values and initiatives within the student community.

Italy

In Italy there is a lack of courses specifically devoted to entrepreneurship in higher education. Nevertheless there are useful subjects for the potential entrepreneur in fields of study like economics, management, industrial engineering, and obviously in MBAs: e.g. accountability, industrial organisation, innovation economics and management, strategy. For every scientific degree, students have to attend at least one subject that at a very general level deals with the above topics. During these courses each professor may devote specific lectures to the subject of entrepreneurship.

Cyprus

Cyprus has one university, with two more due to become operational soon, and a number of private colleges. Entrepreneurship education is limited to the few MBA programmes at the University of Cyprus and the four major private colleges. The University of Cyprus organises the Cyprus Entrepreneurship Competition, with a high-tech focus. Most of the participants are non-business majors. Within the Cyprus Entrepreneurship Competition, there are a number of seminars designed to help participants develop their business plans.

Latvia

In Latvia — as in other new Member States — the overall situation is generally very weak. Entrepreneurship is not integrated across the curriculum, although some courses on

¹² Survey by the Ministry for Industry, Tourism and Trade, Directorate General for SME Policy, 2006.
<http://www.ipyme.org/NR/rdonlyres/C6A4591A-AC7B-42B9-9D9A-C71678149C59/0/EstudioIniciativasEmprendedoras.pdf>

management do exist. Business and entrepreneurship courses are missing in non-economic fields of study, and more generally inter-disciplinary approaches are rare.

Liechtenstein

The University of Liechtenstein is the only academic institution that offers entrepreneurship programmes in higher education. At undergraduate level, the module called “Corporate entrepreneurship” can be attended in the 5th semester of the bachelor programme. At Master of Science level, a Master of Entrepreneurship (MSc) is offered, while at post-graduate level, entrepreneurship is covered by the “Executive EMBA in Entrepreneurial Management”, designed to make especially engineers familiar with entrepreneurial ways of thinking and acting. These courses are developed and offered by the Institute for Entrepreneurship of the University of Liechtenstein¹³.

Lithuania

The overall teaching of entrepreneurship in higher education is quite poor, especially within non-business and non-economic courses. While some noteworthy entrepreneurship teaching examples can be found, even the business studies curricula often lack coaching on how to start one’s own business and acquire relevant skills. The low level of entrepreneurship-related abilities, knowledge and skills in the country, and the lack of consistent and innovative entrepreneurship teaching in the current system of higher education, has prompted spontaneous measures on the part of individual teachers and students. While initially such projects were confined exclusively to the departments of business and/or economics, they are now reaching non-business students as well.

Luxembourg

The University of Luxembourg (UL) was founded in 2003 and is thus in the start-up stage, and the same goes for the teaching of entrepreneurship. However, the UL and the International University Institute of Luxembourg are now developing a range of lectures and other teaching tools geared to fostering entrepreneurial spirit and business creation. To underpin the teaching of entrepreneurship within non-business studies, related modules have been included in the curricula of the faculty of Science, Technology and Communication since 2003 and will also be integrated in the curricula of the new engineering Masters. A Master in Entrepreneurship and Innovation was launched in 2007, and the creation of an entrepreneurial chair at the UL is currently being discussed.

Hungary

Business-related schools and faculties in Hungary seek to provide their students with basic entrepreneurial skills in compulsory subjects, and mostly within the context of business studies. The non-business faculties can be divided into three groups: 1) faculties which offer no entrepreneurial training or even refuse to do so; 2) faculties which seek to provide basic entrepreneurial training as part of short compulsory or optional subjects; 3) faculties which also offer wider-ranging entrepreneurial skills as part of compulsory subjects (+ optional subjects). Two thirds of non-business faculties report the existence of academic chairs geared to teaching these subjects.

¹³ www.hochschule.li/entrepreneurship

Malta

The teaching of entrepreneurship within higher education has until recently been virtually non-existent. A relatively new initiative from Malta Enterprise now offers students in higher education institutions the opportunity to get exposure to the basics of entrepreneurship, through a number of optional modules / seminars. However, an overview of the curricula reveals that the teaching of entrepreneurship is still completely absent in non-business studies, although entrepreneurship can to some extent be addressed within more general study modules.

Norway

Entrepreneurship courses in Norway started to be developed in the mid-80s in the major engineering schools. Universities became more interested in entrepreneurship as in 2003 they got by law the responsibility of intellectual property rights of inventions made by faculty. Some institutions now have Master's programmes in entrepreneurship. The students themselves are demanding more focus on entrepreneurship, and student organisations have been taking the initiative. According to surveys, approximately 15% of engineering students are interested in entrepreneurship. There is still a need to graduate enough PhD students to become teachers of entrepreneurship. In order to further develop this area of study, a better availability of research funding is necessary.

Austria

As a result of Austrian universities' autonomy, the situation with the teaching of entrepreneurship in non-business studies is very diverse. The options range from virtually nothing on offer to obligatory courses. However, the last decade has seen a steady rise in entrepreneurial support for students and alumni. Technical Universities and faculties have begun to run optional entrepreneurship courses as well as interdisciplinary courses. The Alumni society of the University of Vienna and the Technical University of Vienna offer a series of workshops for potential new entrepreneurs (UNIUN-Programme). Within the Academia to Business Programme, business incubators have been set up to support potential High-Tech founders from universities and universities of applied science. The University of Fine Arts in Linz too offers an entrepreneurship course as an optional subject in cooperation with the entrepreneurship chair of the University of Linz. However, the question whether entrepreneurship should be a compulsory course within curricula is still under discussion.

Poland

After 1990 there was a great interest in entrepreneurship in higher education, which was reflected in new private business schools bearing "entrepreneurship" in their names. Courses on entrepreneurship were launched, and in some business schools students were able to choose a specialisation on that topic. However, entrepreneurship education in non-business schools is almost non-existent, and tends to be viewed as low priority and as a "soft" subject compared with the hard sciences. A recent initiative is the nationwide programme "Dynamic entrepreneurship", geared primarily to students in the non-business field.

Portugal

Entrepreneurship is a new subject in Portugal, at least in non-business courses. However, the bigger universities have business parks and incubators running entrepreneurship courses and

business plans competitions. Good examples are the Instituto Pedro Nunes incubator, the Coimbra Innovation Park, and the Biocant park¹⁴.

Romania

There is as yet no general framework or any other kind of guidance in the Ministry of Education for entrepreneurial education at technical universities. In the absence of such a framework, individual universities have developed entrepreneurial education “embryos” wherever there were professors interested in teaching and supporting this kind of initiative. Most of the specialised classes are taught at Master's rather than undergraduate level. There are no Entrepreneurial or Business Management Departments.

Slovakia

There is a great demand for education in entrepreneurship in Slovakia. In fact, entrepreneurial education is the most sought-after type of higher education. Slovak universities have responded to this demand by establishing specialised faculties of entrepreneurship or, in some cases, specialised departments within other faculties. Currently there are 15 entrepreneurial faculties in Slovakia. Interested students can either study entrepreneurship at the faculty (department) of technical / natural sciences, or they can take special courses for credits there, while majoring in another field of study.

Finland

Universities have a mutual agreement that allows students to take courses from other institutions, making it possible to study entrepreneurship even if their own university does not run such courses. However the situation in non-business disciplines is problematic, because only few teachers are qualified and trained in entrepreneurial practice and teaching, and because universities have no specific resources for these purposes. The lack of entrepreneurship professorships makes it especially hard to legitimise entrepreneurship studies in non-business disciplines and to provide research-based teaching methods and material. The majority of these professors operate in Schools of Economics or Departments of Economics within the universities, which is why entrepreneurship studies are concentrated primarily in these institutions (five universities offer entrepreneurship as a major subject within business studies). Hence, there is a shortage of entrepreneurship studies within the non-business disciplines.

Sweden

Entrepreneurship is taught in all business schools and at the technology universities that are geared to management. The depth and variety of the course content varies a lot, from short 5 ECTS modules to 2-year Master's programmes. In other areas of higher education, Entrepreneurship is generally not taught, with a few minor exceptions.

UK

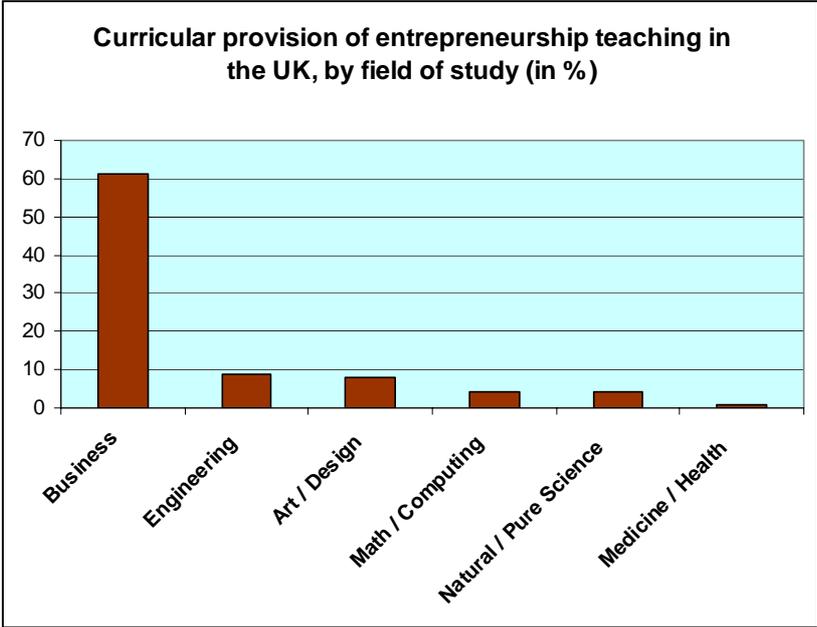
The introduction of successive rounds of government funding for universities significantly impacted on institutional behaviour, and supported new developments in supporting enterprise and entrepreneurship, including curricula innovation. The UK landscape has changed immensely and there has been huge growth in supply, in engagement and in demand. Now the significant majority of higher education institutions in the UK (estimated around 95%) are

¹⁴ www.ipn.pt, www.coimbraiparque.pt, www.biocant.pt

engaged in the provision of different forms of entrepreneurship education to their students. A 2007 survey of Enterprise and Entrepreneurship in Higher Education in England shows that in-curricula provision accounts for 36% of entrepreneurship activity, while the remaining 64% takes place as extra-curricular provision. Within the curricula, 61% of all provision is delivered within business studies (compared to 9% in engineering, 8% in art and design and 4% in sciences). 80% of this provision takes place at undergraduate level.

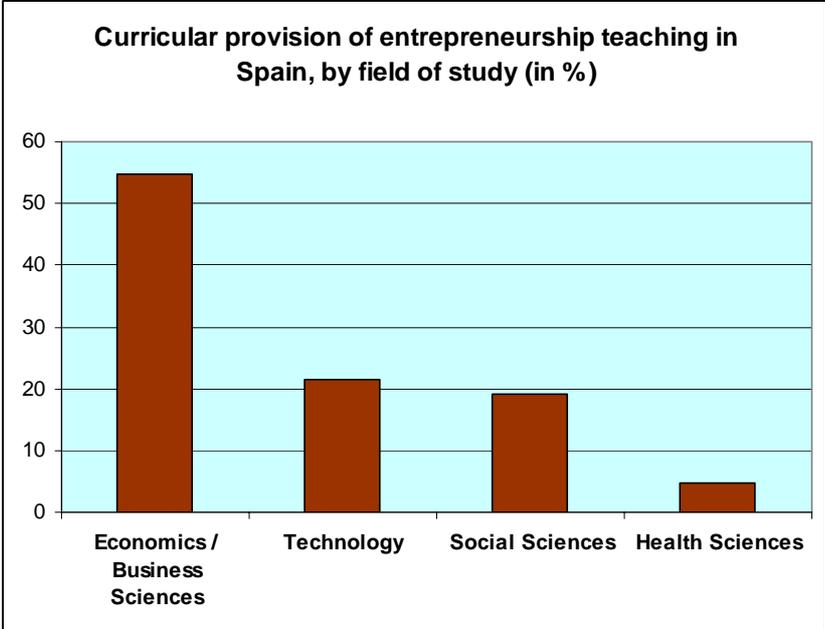
No information was received for **Bulgaria** and **the Netherlands** (while **Slovenia** is not taking part in this Expert Group).

Table 1: Entrepreneurship in Higher Education in the UK



Source: National Council for Graduate Entrepreneurship, 2007. Report on Enterprise and Entrepreneurship in Higher Education.

Table 2: Entrepreneurship in Higher Education in Spain



Source: Survey by the Spanish Ministry for Industry, Tourism and Trade, Directorate General for SME Policy, 2006.

3. ABOUT PROGRAMMES AND ACTIVITIES

3.1. What is entrepreneurship in Higher Education ?

A general definition of entrepreneurship education is provided in *Section 1.1*. In higher education the primary purpose should be to develop **entrepreneurial capacities and mindsets**.

Entrepreneurship education programmes can have **different objectives**, such as:

- developing entrepreneurial drive among students (raising awareness and motivation);
- training students in what is needed to set up a business, and to manage its growth;
- developing the entrepreneurial abilities needed to identify and exploit business opportunities.

The purpose of the course/programme should be precisely defined, as should its expected outcome(s). While the creation of graduate **start-ups** is therefore a desirable outcome, it should not be forgotten that entrepreneurship is also (and equally) about successfully **managing innovation and growth**. In existing business and entrepreneurship programmes very often only the start-up aspect is considered, while the skills and knowledge needed to manage the growth phase of a small business are neglected. In this sense, there is in general terms a need for a shift in the focus of entrepreneurship education programmes and courses across Europe.

A perceived lack of relevant experience and a lack of self-confidence are two often cited reasons for new graduates not engaging in entrepreneurship soon after graduation. The university experience should be capable of addressing both these needs.

The learning experience needs to build depth and breadth in awareness, understanding and capacity. Although not applicable in all cases, the general approach would be to provide broad exposure and positive and motivational experiences during the early stages of university life. This then provides a platform from which to build depth and capability in preparation for an entrepreneurial career at the point of exit. The important point here is one of **progression**, not only through university, but also **through the whole education system at all levels**.

Integration of entrepreneurship into the curriculum needs to be the vision for a higher education institution as part of its wider mission. Provision should be accessible for Arts and Humanities students as it is for Business/Social Science and Science/Engineering students. Educators should be comfortable and skilled in addressing a diversity of student groups, from different cultural backgrounds, by providing examples and role models that relate to their contexts.

Recent data from certain European countries show **that the majority of entrepreneurship courses are offered in business and economic studies** (for instance in **Spain** and in the **UK**, see *Tables 1 and 2 in the previous Section*). However, it is questionable whether business schools are the most appropriate place to teach entrepreneurship: innovative and viable business ideas may be more likely to originate from **technical, scientific and creative studies**. In **Germany**, most spin-offs are from universities of applied sciences and technical universities. Therefore, the real challenge is to build **inter-disciplinary** approaches, making entrepreneurship education accessible to all students, and where appropriate creating teams

for the development and exploitation of business ideas, mixing students from economic and business studies with students from other faculties and with different backgrounds.

Northern Ireland provides a good example of introducing entrepreneurship to Engineering, Science, and Technology students. Since its establishment in 2000, the Northern Ireland Centre for Entrepreneurship (NICENT)¹⁵ has delivered entrepreneurship education to over 18.000 students across Northern Ireland (around 15.800 undergraduate and 2.200 postgraduate students). At the end of the Academic Year 2006/07 entrepreneurship had been embedded in a total of 241 courses at different faculties in all higher education institutions. While in the period 2000 to 2006 NICENT focused on the Science, Engineering and Science, disciplines, it is now expanding its initiative also to Arts, Humanities and Social Sciences.

For science/technical students at the **University of Cambridge** (UK), there has been a focus on three aspects of entrepreneurship education:

1. Entrepreneurial motivation: the question of what motivates individuals; the social and economic importance of commercialising science and technology; the fun aspects of it; through role models, examples and class discussions.
2. Opportunity recognition: this is a very important aspect of entrepreneurship education as so much is predicated on whether or not people are able to “see” an opportunity that motivates them to pursue it. This is taught through “action learning” methods.
3. Commercialisation: through a variety of situations and a number of ways to different levels of depth. Lectures from practitioners; business plan competitions; short pieces of course work; small group supervisions etc.

Higher education institutions should **offer a range of courses**, rather than settling on a particular model of delivery. Especially in the early stages of promoting entrepreneurship education, it is better to have a diverse range of provision: options that students can take, extra-curricular activities, business plan competitions and other activities that have the added advantage of bringing the local business community into the educational environment. ‘Near’ graduates and postgraduates are more likely to be in a position to exploit opportunities for entrepreneurship, whereas new undergraduates may be seeking greater awareness/understanding, ideas, opportunities, motivation, confidence to act and new social networks. The awareness raising could and should target all students, while a selected group will be interested in acquiring those specific skills needed for managing and growing a business.

Therefore within a variety of courses that higher education institutions can offer, including some inter-disciplinary ones, the following main aspects should be covered: a) generating ideas and recognising opportunities, b) creating a new venture/organisation, c) growing a young venture. Certain other aspects can be very important, such as: innovation management; corporate entrepreneurship and *intrapreneurship*; entrepreneurial management; entrepreneurial marketing and finance; corporate succession.

¹⁵ www.nicent.ulster.ac.uk

The **Lahti University of Applied Sciences** (Finland) created a programme called “Business Succession School”¹⁶, linking students with business owners who are looking for a successor. This is a training programme for universities of applied sciences providing the skills to plan and run a controlled transmission of the enterprise to the student, who will be able to continue the profitable business and ensure business regeneration. This practice — piloted in the Lahti University of Applied Sciences — is being extended to ten other universities of applied sciences in **Finland**.

Under the **Bologna Process**, teaching should be directed towards the competences that are relevant to each level. The EU-funded Tuning Project¹⁷ translates these into generic and subject-specific competences: 27th in Tuning’s list of 30 generic competences is ‘initiative and entrepreneurial spirit’; many of the other items effectively underpin it. Both the Bologna Process and the Tuning Project assume outcome-focused study, appropriately credit-weighted and reliably assessed.

However, **the linear progression of Bachelor-Master-Doctorate** is not the only route that students can take. Indeed, it may be that entrepreneurial students are less likely to follow this conventional route. With lifelong learning, it can no longer be taken for granted that students study full-time, or that Master's students are necessarily older than undergraduates, or that Master's courses include content which is not found at other levels. It follows that content and teaching methods should grow out of the needs of specific student groups, rather than follow a prescribed curriculum.

3.2. What to teach ?

The views of members of the Working Group diverged to some extent as to whether the **content** of teaching should be different for **students in business and in non-business studies**. Some argue that the content will be similar, but the way of delivering it will be different. There is a general perception that engineering and science students will appreciate a more practical approach, and it is commonly agreed that these students will also need some basic elements of economics, marketing and management techniques. The fact is that the majority of students in non-business studies do not have an extensive knowledge of business subjects.

In dealing with economic subjects and entrepreneurship, the best way of motivating students from other fields is by **presenting examples from the relevant technical area**. The focus should be on the essential connections and practical aspects, having regard to the particular target group of students.

Non-business students are very good technically, and frequently have very strong product ideas. However, they are weak in the area of commercialisation and marketing. Students from this background therefore require tailored lectures on **Intellectual Property, Commercialisation Process, Marketing and Venture Capital**. The goal should be that whatever the graduates from technical faculties are working on, they always keep an eye on the entrepreneurial aspects. In fact, most non-business students tend to be product-oriented in their approach to business, and do not understand that no matter how innovative the product,

¹⁶ www.jatkajakoulu.fi

¹⁷ <http://tuning.unideusto.org/tuningeu/>

if the market does not demand it there is no sustainable business. This should help to avoid one major mistake of young technical entrepreneurs, to develop the product first and only then look at the market potential.

On the other hand, teaching entrepreneurship for **students in the economic and business fields** has a much narrower focus, as the other business competence studies are offered separately (marketing, management, etc.). So entrepreneurship education will stress the **start-up phase** and the **growth of an SME**. The pedagogy itself should contain entrepreneurial and enterprising experiences and opportunities. Just knowing about entrepreneurship is not an adequate basis for enhancing entrepreneurial behaviours, and for influencing the intentions of young people. What is needed is not just the content or pedagogy, but the whole learning environment.

Most of the Experts agree that objectives, contents and methods of teaching may differ according to the **level of education**. While with **undergraduates** the most important thing will be to work generally on students' mindsets and to stimulate interest in self-employment and business creation (awareness and motivation elements), **graduate and post-graduate students** will need practical tools (such as business plan competitions) and concrete support for their business ideas. However, the Bologna Process aims to make first degrees appropriate for entry into the labour market, and as such the content of entrepreneurial training, even at undergraduate level, should be complete enough to enable students to embark on their own start-up initiative at the conclusion of the training.

A **brief overview of common elements of entrepreneurship education**, and of the **diverse needs** of the different target groups, is provided below. These descriptions, and particularly the typically relevant topics for some specific target groups, should not be considered as in any way exhaustive. The aim is to give a general idea of the contents of entrepreneurship education, given that different types of students may have different needs, while some general features will be the same for everyone.

- *Some main elements of entrepreneurship education (in different fields of study):*

Through appropriate methods of delivery (*see Section 3.3.*), programmes and courses should be geared to the acquisition of **generic** and **horizontal skills**, aiming to make students:

- more creative/innovative; highly motivated; pro-active; self-aware; self-confident; willing to challenge;
- better communicators; decision-makers; leaders; negotiators; networkers; problem solvers; team players; systematic thinkers;
- less dependent; less risk averse; able to live with uncertainty; capable of recognising opportunities.

In terms of **specific content**, programmes and courses should be adapted to **different target groups** (by level: undergraduate, graduate, post-graduate, PhD; by field of study: economics/business, scientific/technical studies, humanities, arts & design, etc). The higher the level of studies, the more complex and close to real business life is the content of teaching (up to start-up financing competitions, etc).

Teaching should use an **inter-disciplinary approach**, the ultimate objective being that to combine students from different faculties and different fields of study, who will cooperate in developing joint activities and projects.

Courses and activities on/about entrepreneurship for all categories of students, in any field of study, provide basic business skills and raise awareness of entrepreneurship as a potential career option. This does not relate only to start-ups, but also includes intrapreneurship and encouraging enterprising individuals across all walks of life.

Most of the possible contents of entrepreneurship courses are relevant for students from all fields of studies. However, in order for the teaching to be tailored to the specific needs of different categories, **more emphasis is placed on one aspect or another**, for instance:

- Entrepreneurship within **business schools and economics studies** focuses on business start-up and new venture creation, and on the management and growth of SMEs. Students of economics learn to work with students from different fields (engineering, scientific studies, etc).
- Entrepreneurship within **science and technology studies** is especially concerned with exploiting intellectual property, creating spin-off companies and venturing, and offers courses on issues such as:
 - management techniques;
 - marketing, commercialising and selling of technology based ideas;
 - patenting and protecting technology based ideas;
 - financing and internationalising high-tech ventures.
- For students in **humanities**, the focus will be on self-management and on social entrepreneurship, which is an emerging area of growth and provides opportunities to make a difference to social and community contexts.
- Entrepreneurship for the **creative arts and design** focuses on opportunities emerging through creativity and creative working, preparing graduates to work as freelancers or self-employed people, or creating small enterprises and ventures.

It follows that in humanities and in creative studies alike, the following topics are particularly relevant:

- social entrepreneurship;
- self-management;
- user-driven innovation;
- part-time and freelance entrepreneurship.

At the **University of Strathclyde** (UK), the Department of Applied Music provides teaching on entrepreneurship (*example in Section 5*), recognising that self-employment is potentially part of graduates' careers.

3.3. How to teach ?

It is important that the **purpose** of the course/programme is precisely defined, and that it is geared to the expected **outcomes**. In other words, defining precise objectives for the course, programme or activity will influence the choice of appropriate teaching methods and tools, and will make it easier to measure the outcomes in relation to the objectives.

In the **UK**, the National Council for Graduate Entrepreneurship has produced a **template** with the objective of linking the desired entrepreneurial behaviours and skills to be acquired by students (outcomes of education) to the appropriate pedagogies to be used in order to reach the expected result. This template matches 11 skills (and behaviours), with 31 different pedagogies, showing the possible relations between them¹⁸.

Members of the Group of Experts report that — across higher education institutions in Europe — a wide range of **methodologies** exist, supplementing lectures as the most basic tool of teaching. However, there seems to be some **gap between methods applied and those that are viewed as the most effective** and appropriate. In particular, there should be stronger involvement of businesses and entrepreneurs, and a broader application of methods based on case studies and on concrete projects.

Innovation and effectiveness stem primarily from action-oriented and student-inclusive teaching forms, teaching students “how to” so that they can understand the more theoretical aspects more easily, involving students heavily and actively in the learning process, and involving “outsiders” in the learning process. The people doing the teaching should be to some extent entrepreneurs themselves, building their input on **real-life experience**. Crossing the boundary of the university and the world outside is one of the reasons why such teaching is often experienced by the students as very different from the traditional teaching experience in higher education.

Experts were asked to highlight which **teaching tools / methods**, according to their own knowledge and experience, educators find most appropriate or effective in delivering entrepreneurship programmes and courses, in particular to non-business students. The results of this enquiry indicate a clear preference for methods based on “**group and team techniques for creating new business ideas**” and for the use of “**case studies**”. Following these two main categories, other tools highlighted as particularly effective were “**business planning workshops**” (which partly overlap with the first category proposed, confirming the preference for group and brainstorming techniques and for breeding new ideas), “**inviting guest speakers**” (namely entrepreneurs) and “**business simulations**”. Also, methods based on undertaking some practical entrepreneurial activity and creativity exercises leading to the development of ideas were among other tools whose effectiveness was underlined.

Experts emphasised the importance of **crossing boundaries between disciplines**, and of working in teams. Whatever the level of students, a powerful way of teaching entrepreneurship is to **mix business and non-business students** (for instance, some institutions organise already common Master's programmes for engineers and business people, *see examples in Section 5*). This is always valued by the participants, who consider that they learn from each other and discover new ways of thinking.

Business plan activities should be based on real business ideas. **Case studies** to be used should be “live”, e.g. they refer to existing companies, and should be also local. Selected case studies should preferably provide students with role models they can easily identify with.

Interestingly, **traditional lectures were hardly mentioned** by the Experts as effective tools for entrepreneurship education.

¹⁸ www.ncge.org.uk

An important conclusion is that **traditional educational methods do not correlate well with the development of entrepreneurial traits and attributes**, and that **multi-disciplinary collaboration** is an essential element of building enterprising abilities.

There is a need for greater **flexibility in course design**. Work placements, alternation between full- and part-time study, organisation of intensive courses, and accreditation of informal and non-formal learning all have a role to play.

The **University of Wolverhampton** (UK) is coordinating the **SPEED** project (**Student Placements for Entrepreneurs in Education**)¹⁹, a network of 13 institutions to help students develop self-employment opportunities as an alternative to traditional work placements. Students present their business ideas to a panel. If accepted, they are offered a placement of 9 to 12 months. Each student is helped to develop a personal and business development plan, and is given access to one or more mentors selected for their experience in a related area. The placement may be full time, as part of a sandwich degree course, or part time alongside their academic studies. Each student is supported by a mixture of bursary payments, finance for business related activities and professional services. The institution provides additional resources in the form of incubation facilities and skills training. Where possible a SPEED placement will be credit bearing for the student.

In particular for students in **scientific and technical fields**, a strong practical component should always accompany the theoretical aspect. Since any initiatives undertaken by the students would probably be in their own fields of study, it is important for training to be provided by someone who is well versed in both their specific field of study and in entrepreneurship. This makes entrepreneurship seem a logical continuation of the study, rather than an annex running parallel to it.

Subject knowledge needs to be better balanced with process understanding, i.e. the ‘how-to’ and importantly the ‘know-who’, as many students lack the relevant social networks for achieving their entrepreneurial aspirations.

Finally, training in action-oriented and creative competences should take place in **many areas other than entrepreneurship**. It is a question of how to teach rather than what to teach. Traditional lecturing, ‘feeding’ passive students, is largely inappropriate in this field and, more generally, an inefficient way of learning.

There is a need to shift to **more interactive learning approaches**, where the teacher becomes more a moderator than a lecturer.

In **Denmark**, the International Danish Entrepreneurship Academy (IDEA) and associated universities organised more than 10 **innovation camps** during 2005-2007, bringing together students, business people and teachers in a selected physical space and for a limited time. Inter-disciplinary groups of students work on ideas taken from firms and solve problems. In November 2007 IDEA tried a new camp model matching students, business people and university technology transfer people, working with three university patents for 48 hours, and coming up with ideas on how these patents could be applied for practical use.

¹⁹ www.speedproject.ac.uk

At the **EPF Engineering School** in France, each year 36 engineering students run a real company that designs, produces and sells mid-range/high-standard pens. For a six month period, each of the students takes a job in the different departments of the company (financial, logistics, IT, etc). Every year a new product is developed, and students have to give their best to make the company grow²⁰.

More examples in Section 5 from **Johannes Kepler University Linz** (Austria), **Turku University of Applied Sciences** (Finland), **Norwegian University of Science and Technology** (Norway), and **University of Porto** (Portugal).

3.3.1. About educators, and the role of business practitioners in teaching

The use of **experience-based teaching methods** is crucial to develop entrepreneurial skills and abilities. Therefore in order to integrate entrepreneurship across the curriculum, the use of action-oriented pedagogies should be favoured in all disciplines. This kind of methodology is labour intensive and costly, and requires specific training. So more educators need to be trained in this field.

Professors should have a background in academia, and recent experience in business, such as in consulting for, or initiating, entrepreneurial initiatives. Ideally they should maintain strong personal links with the business sector. The best professors are teachers who have the required teaching competences as well as real professional experience in the private sector. For those with no experience in the private sector, specific teaching modules should be integrated into the curriculum of future professors, such as “How to devise and teach a case study”. Education authorities and higher education institutions should place emphasis on the **training of educators**. Moreover, **existing training schemes for teachers very often lack a global, trans-national dimension**. Cross-European initiatives should be taken in this field.

In **Denmark**, in 2008, IDEA started an International Master's in Entrepreneurship Education and Training (organised by a consortium of Danish and European Universities), and a Diploma Course for Entrepreneurship aimed at post-graduate training for Danish teachers.

In **Poland**, the Ministry of Science and Higher Education has provided financial support to the Dynamic Entrepreneurship Programme to train entrepreneurship lecturers from 20 non-business institutions (see *also example in Section 5*).

In the **UK**, in 2007, NCGE and UKSEC, in partnership with the Higher Education Academy and the Kauffman Foundation, launched the UK's first International Entrepreneurship Educators Programme.²¹

However, there is very little in terms of **incentives** to motivate teachers and reward them for getting involved in entrepreneurial teaching and activities with students. For instance, research and getting published remain the main criteria for promotion, while practice-based projects do not receive the necessary consideration.

²⁰ www.dekenz.com

²¹ <http://ncge.com/communities/education/content/get/5>

Not all **educators** are university professors. The fact that educators come in many forms should be recognised. Those with experience in the entrepreneurial field should be set alongside professors in a synergy relationship.

Most teachers have little or no practical experience of being entrepreneurs themselves. So the **participation of real entrepreneurs** in the teaching can make up for the existing lack of practical experience of professors. Especially within working groups and business planning seminars, **outside coaches** should play an important role, as students perceive them as having more credibility as regards entrepreneurship than traditional teachers.

Particularly at universities it is very difficult to include practical business people in the permanent staff, due to research criteria. Universities attempt to overcome this problem by two, often combined, approaches: hiring external, part-time lecturers with business experience, and collaborating with the world of business outside universities.

Presentations by entrepreneurs in lessons are not only important because they impart knowledge, but also because they provide an example which can be followed by students. It is therefore very important that as many student entrepreneurs as possible (or at least those who started their enterprise as students) report on their successes at higher education institutions. It is harder for some students to imagine becoming the next famous entrepreneur. However, it is much easier for students to imagine that they can also do that which other students succeeded in doing several years ago.

Unfortunately, European higher education institutions are not sufficiently involved and effective in **working with alumni**. The best universities build and maintain very good networks with their alumni, who can bring back knowledge and funds.

As regards the current state of play in European higher education, Experts believe that **entrepreneurs and business practitioners are in general involved in the teaching**, but their presence needs to be increased. Also, there are few examples of entrepreneurial practitioners engaged in the full curricula experience. Most frequently, they are only engaged in short presentations to students (e.g. as testimonials or guest lecturers) or as judges in competitions.

There are exceptions, though, and the landscape is changing. At the **University of Cambridge** (UK), over a 6-year period, a panel of some 200 entrepreneurs and other practitioners was built up to help deliver interactive courses.

Ideally, entrepreneurs should receive some training on how to address students. One suggestion is to identify and train an "Academy" of high profile Entrepreneurs who are prepared to give of their time and can be relied upon in the classroom (this has been done for instance in **Wales**). Also, it should be taken into account that entrepreneurs are more motivated to come back to their previous school/university. This also reinforces the identification of students to their case and experience. For the same reason, visiting entrepreneurs should preferably have the same educational background as the students.

In **Belgium**, the FREE Foundation²² organised a 2-day **seminar for entrepreneurs** to train them to use case studies, to speak in front of students and to teach some section of a course. The seminar was offered to them in exchange of a commitment to spend (for free) at least 30 hours of their time over a period of three years for teaching. These entrepreneurs are now an important resource for education.

3.3.2. Cooperation and mobility between university and enterprise

Effective cooperation between higher education institutions and enterprises requires a win-win situation for both parties. Students and teachers have something to contribute to enterprises, mainly based on theoretical knowledge, and enterprises have something to contribute to educational institutions, mainly based on practical knowledge. In order for higher educational institutions to benefit, the collaboration should be long-term oriented, e.g. involving entrepreneurs and businesses leaders as mentors and advisers in building student business hatchingeries and incubators, or in developing new entrepreneurship courses and study programmes, including internship programmes. For enterprises there should be short-term benefits too, e.g. through involving student groups in innovation activities, particularly helping firms formulate and develop radical innovation ideas, and through linkage to research activities. Taking these basic rules into consideration, close collaboration can be established between SMEs and higher education institutions.

According to the Experts in this Working Group, **mobility of teachers and researchers** between higher education institutions and business is in general very low, and the practice is not encouraged. There are in many cases little or no incentives, or even disincentives. For instance, lecturers may not be allowed to participate in external commercial activities (such as in **Ireland**). Also, there are few individuals capable of, and keen on, mobility across these two communities/environments. However, in some countries the mobility of teachers and researchers between higher education and business is encouraged at the state level (**France**), or programmes have been established for members of the scientific staff considering a change to a non-academic career (**Austria, Germany**).

In **France**, the mobility of teachers and researchers between higher education and business is encouraged at the state level. Since 1999, a law has allowed researchers to quit universities and labs to create a new venture based on their work. A network of academic incubators has been set up to support them. They are allowed to go back to university if desired. Between 2000 and 2005, 844 enterprises have been created by researchers in France, through academic incubators. Recently a new type of company, called “Young Academic Enterprise”, allows significant advantages to encourage business creation by researchers and students.

In **Germany**, some universities give their professors the opportunity to get practical business experience. For example, the Gelsenkirchen University of Applied Science can give professors one semester off for testing and using scientific expertise and methods as well as to get practical experience in firms (after a period of at least eight semesters).

In **Spain** a new Act for Universities was published in 2007, reforming the Statute of University Professors and enabling them to participate in business projects.

²² www.freefoundation.be

In practice only few experienced **entrepreneurs** succeed in shifting to colleges/universities. They usually have to accept a lower income, and the route to a permanent position is long at universities. In general terms, there is very little in the way of incentives. Higher education institutions have yet to openly accept entrepreneurial experience as a valid basis for senior teaching positions, especially at professorial level. The other way round, only few experienced teachers and researchers succeed in making a complete shift of career to the world of business. Teachers moving into business are likely to do so because of the inability or inappropriateness of institutions to meet individuals' aspirations.

One route forward here would be to increase the number of part-time positions, such as external lecturer and assistant professor positions. Another is to create a new category of positions at universities/colleges for well-educated academic staff with substantial entrepreneurial and business experience and limited research experience.

Both communities could do more to increase mobility, but some **incentive** to do so is likely to be required to stimulate action. Higher education institutions can offer dedicated **sabbaticals** and **secondments** in enterprises and/or for entrepreneurial development, and appoint professors based on **entrepreneurial experience** rather than research achievement. Equally, **businesses** can offer senior positions for academics on their boards as non-executive directors or within their management team as an adviser/consultant.

3.4. Supporting students' business ideas

A distinction needs to be made between awareness raising and education, and actual business support. This Report focuses primarily on building awareness and on offering education programmes, courses and activities. The emphasis is on creating the entrepreneurial mindsets and capacity.

Support for university **spin-offs** is a vast and complex issue, for which a specific Expert Group would need to be created. Moreover, the concept of innovative spin-offs is not particularly relevant for businesses started by students, who do not have formal links with the university. It seems therefore more appropriate to speak of **innovative, knowledge-based businesses** launched by students and university graduates. Such students would benefit from dedicated advisory and support programmes.

The issue of building mindsets and abilities cannot be viewed in isolation from the overall context. Entrepreneurship courses and activities should be part of a **wider entrepreneurial programme** within the institution. A high visibility of the "entrepreneurial commitment" of an institution is achieved through the presence of dedicated spaces, such as "hatcheries" or incubators, and through support for students' start-up plans.

Certain ideas are therefore proposed here on existing or desirable support mechanisms and services that will help students in developing a viable business.

Members of the Expert Group were asked whether entrepreneurship courses and activities in their respective countries are normally conceived as part of a wider entrepreneurial programme, with support mechanisms and services to support students' business ideas and new company start-ups; and whether such mechanisms and services are available for students at all levels. Their answers suggest a rather uneven picture in Europe, with a more or less equal split between "yes" and "no". Where support services exist, they seem to be available in

most cases to students of all levels (undergraduate, graduate, post-graduate), while in fewer cases they address mainly post-graduates and staff of the institutions (this situation is reported for instance in **Ireland** and **Portugal**).

However, Experts highlight the fact that **business incubators**²³ exist in many cases outside university, and are available to all business starters. It is advisable but not essential for them to be embedded within universities: what is important is that students are linked and directed to them.

A challenge lies in **integrating start-up activities** into degree studies, as they are currently mostly outside the curriculum and sporadic in nature.

Experts were also asked whether the education systems in their respective countries support higher education institutions in promoting the **commercialisation of new technology**. A positive answer was given in most cases, though not in all.

If the business idea and/or innovation is developed inside the university, basic problems relate to **intellectual property rights** and to teachers' role as civil servants (in some countries the law prevents teachers and researchers working as entrepreneurs and exploiting innovations developed in their work). Institutional **IP policy** can significantly affect opportunities, as does the institution's staff employment contract.

Desirable measures and tools — both in the overall environment (framework conditions) and at the institution level — to encourage **innovative start-ups** by students and researchers are as follows:

- a policy to promote entrepreneurship in scientific labs;
- a good institutional policy in terms of intellectual property rights;
- dedicated and supportive incubators, or easy access to external incubators;
- favourable business environment: this means that incubators should create strong links with the business and financial community;
- financial grants to support the entrepreneur, and/or access to other financial resources.

In **Germany**, EXIST — Business Start-ups from Universities and Colleges — is a programme of the Federal Ministry for Economic Affairs and Technology, aimed at improving the entrepreneurial climate in higher education and boosting the number of technology and knowledge-based start-ups. It supports students and staff from higher education and research institutes who would like to translate their idea into a business plan, including funding for the seed-phase of start-ups.

In **Lithuania**, the Ministry of Economic Affairs launched a project in 2006 called “Financial assistance for starting business — for students of science and technologies”, targeting specifically students of science and technical study programmes, and aimed at supporting their business ideas and new company start-ups.

²³ See also the Report published by the Commission on Benchmarking the management of incubators, February 2002, available at: http://ec.europa.eu/enterprise/entrepreneurship/support_measures/incubators/index.htm

The INNOVA²⁴ programme of the Polytechnic University of Catalonia (Spain) is open to all students, faculty, graduates and staff, with the objective of taking innovative ideas and projects generated in the university and turning them into ventures. The programme is run by a support centre for the creation of technology-based firms, with the involvement of the universities and business schools of Catalonia. It operates at the various steps of the entrepreneurial process: awareness-raising activities, including creativity workshops, extracurricular training actions; start-up assistance; location in enterprise hatching; financing. Since its creation, the INNOVA programme has helped in creating 197 technology-based companies (for Spain, see also the example of the Autonomous University of Madrid in Section 5).

3.5. Criteria for good practice in delivering entrepreneurship education

On the question of how the teaching of entrepreneurship can best be applied in concrete terms, the members of the Expert Group were asked to identify a set of **key features** for effectiveness and success in implementing these programmes. These are proposed as general indicators for **good practice**.

Following precise directions from the Experts, the good practice factors cover the way entrepreneurship teaching should be delivered (“**how to teach**”), and not the specific content of the teaching.

This list does not take into account elements related to **external framework conditions**, i.e. to the overall environment in which programmes and activities take place, such as support from public authorities. These aspects will be taken into account in other sections of this Report, when identifying public policies or measures that can be supportive to entrepreneurship education.

- Good practice criteria in delivering entrepreneurship education

- 1) The purpose of the course/programme is precisely defined, being linked to the delivery of the expected outcome (definition of objectives, and capacity to measure outcomes related to those objectives).
- 2) There is a balance between the theoretical and practical aspects. Teaching makes use of interactive and pragmatic methods; active self-learning; action-oriented pedagogy; group work; learning through projects; student-centred methods; learning by direct experience; methods for self-development and self-assessment. Delivery is through mechanisms that maintain the motivation of students at a high level.
- 3) Activities and events are organised to improve students’ ability to work in a group and build a team spirit, and to develop networks and spot opportunities.

²⁴ www.pinnova.upc.es

- 4) Different guest lecturers are involved (e.g. experts on patent law, company financing, etc). A close relationship is in place with the local entrepreneurial environment, and educators are part of relevant networks (formal and informal). There is a collaborative approach with real business practice and industry.
- 5) Young entrepreneurs (for instance, alumni who have started a company) and experienced business people are involved in courses and activities, and contribute to their design. Practical experience, by means of students cooperating with enterprises and working on concrete enterprise projects, is embedded in the programme.
- 6) Courses and activities are part of a wider entrepreneurial programme, with support mechanisms for students' start-ups in place and actively utilised.
- 7) Exchanges of ideas and experience between teachers and students from different countries are sought and promoted, to encourage mutual learning and to give an international perspective to programmes, courses and activities.

4. OBSTACLES, AND FACTORS OF SUCCESS

4.1. Obstacles

The members of the Expert Group were asked to identify existing **obstacles**, or negative factors that might hinder the dissemination of entrepreneurship courses, programmes and activities in higher education, and/or the effectiveness of this type of education.

A basic principle is that entrepreneurship should be spread horizontally in the curriculum, across different fields of study. In this respect, **one main structural problem** is the division of higher education institutions into faculties and schools. This may work against the kind of cross-cutting that favours multidisciplinary teams and projects. Faculties and departments are very often working quite separately, with many obstacles for students who want to move and for teachers interested in establishing cross-disciplinary courses. The curriculum structure is often an impediment: money follows credits, so a structure can almost naturally be against inter-disciplinarity.

There is a problem of **awareness and motivation within the institutions**, when entrepreneurship is a priority neither for administration nor for faculties. In most cases, research publications are seen as being far more important. Therefore entrepreneurship within an institution is very much dependent on the willingness and vision of certain leaders. This is not an organisational problem, but rather a strategic one. Entrepreneurship programmes should be evaluated like other aspects of academic excellence. Practice-oriented modules and exercises should not be seen as non-academic *per se* — which is often the case at universities today. On the contrary, the basic point of view should be that achieving a high academic standard is not only about the ability to reflect, imagine and analyse based on established knowledge, but also about applying knowledge to practical purposes.

Resources (human and financial) are another issue. There is clearly a need for more entrepreneurship education — the demand from students is increasing — but it is not possible to meet this demand fully with the current staff involved in entrepreneurship studies or business studies in general. The use of action-oriented teaching methods is crucial for developing entrepreneurial abilities, but this is labour intensive and costly, and requires specific training.

Funding is in clear mismatch to the demand for entrepreneurship studies. Schools of Economics, or similar departments within the institutions, often have insufficient resources to train students from the other departments. And the non-business faculties cannot increase their own supply of entrepreneurship studies for the same reason. Therefore, a main priority is to organise specific funding for this type of education, embedded in the institution's core financial resources. The fact is that the termination of short-term project funding, or the continuous changing of funding mechanisms, creates fragility and runs counter to sustainable provision.

There are currently too few **professors** of entrepreneurship, and many of them have not been trained from the start in that field. As a consequence, they may be unaware of the right approach to entrepreneurship teaching. Teachers should have a better understanding of entrepreneurship education, and of the range of aims, methods and contents. There is a need for more teacher training, seminars and workshops. There is also a need to **graduate enough PhD students** in entrepreneurship, to build up teaching resources. However, it is currently

difficult to build a career in entrepreneurship, as research remains the main criterion for promotion.

The lack of relevant skills and experience to teach entrepreneurship is especially acute in the **post-transition countries** of central and eastern Europe. This can be overcome, or at least alleviated, by:

- a) establishing professional networks for the regular sharing of teaching practices and methodologies;
- b) short-term exchanges of entrepreneurship teachers between the institutions of higher education in order to disseminate best practice and teaching methods;
- c) short-term internships of teachers in businesses.

A main prerequisite for achieving a good level of entrepreneurship teaching is ensuring that educators are close to the problems and issues of the real business world.

From the perspective of **involving entrepreneurs in education**, there are also certain obstacles: a) their own business activities are time consuming, so it is almost impossible to count on them on a regular basis; b) often, universities are not able to pay them their proper “hourly market price”.

An indicative **list of main risks and obstacles** identified by the Experts is set out below:

- lack of support from decision-makers;
- changing political environment, with changing priorities and orientations;
- a bureaucratic culture inside institutions, and organisational inertia; inappropriate institutional policies, practices, cultures and structures;
- conflicting academic philosophies of the role of entrepreneurship in higher education;
- opposition to, or little acceptance of, entrepreneurship due to existing prejudices, such as the perception that entrepreneurship means business invading universities or that everyone has to become a businessman; lack of support for entrepreneurship professors within the institutions;
- lack of cooperation among different departments/faculties;
- a negative image of entrepreneurs, and a lack of positive role models for young people;
- only a minority of professors and professionals are really committed;
- some professors are still of the opinion that technical students should learn only technical know-how;
- lack of desire to change the way in which teaching has always been delivered;
- courses are taught just as academic courses by educators who have no link with business life;
- entrepreneurship may not be correctly understood, with a risk that this “heading” is used to “cover” any business course (e.g. finance, marketing, accounting);
- failure to get students enthusiastic for this type of course;
- no understanding of the need for tailored programmes;

- poor use of a broad base of pedagogical tools;
- lack of rewards, incentives, recognition for faculty and educators;
- no established systems for evaluating programme results;
- lack of alignment between practices, outcome and impact;
- the business world tends to underestimate the universities' role as a driver of economic development;
- sustainability issue: the fragility of funding and resources.

4.2. Factors of success

Experts were also asked to identify **factors of success** (or necessary **framework conditions**) for integrating entrepreneurship into higher education, and ensuring that entrepreneurship is spread across the curriculum and reaches students in different fields of study.

While public policies and the overall outside environment can play an important role in ensuring that the teaching of entrepreneurship can be spread effectively (external framework conditions), at the level of higher education institutions an important success factor is the extent to which traditional lecturing in the field has been substituted by a more balanced pedagogy with a substantial element of active self-learning. The ultimate success factor is transformation into an “entrepreneurial university”, characterised by a diffused entrepreneurial culture. Many universities and colleges are clearly moving in that direction, but are still far from this end goal.

In the following list, factors of success are divided into a number of broad categories, showing at which level favourable conditions should be created or enhanced.

Most of the issues listed below are further developed in *Section 6 (How to move forward: a strategy for entrepreneurship education)* and *Section 7 (Final recommendations for action)*.

Level of public policy:

- There is a national framework of support, helping institutions to develop and expand their entrepreneurship mission and activities.
- The mobility of teachers and researchers across national borders, and between academia and the business world, is supported by institutions and at the policy level.
- Support programmes for entrepreneurship educators are in place.

Level of external framework conditions:

- Relevant skills were developed by students during primary and secondary education.
- There is a back-up infrastructure of venture capital and bodies that can support entrepreneurship.
- Networks and programmes are in place for sharing information, practices and teaching material, at national level and between Member States.

Level of institutions:

- Entrepreneurship teaching and training is seen as a strategic goal; there is an explicit mission, and it is possible to assess how this mission is fulfilled.
- There is a common understanding of the need for cultural change, from a bureaucratic culture to an entrepreneurial culture, and there is institutional progression towards an entrepreneurial university model.
- The impact of entrepreneurship education is clear.
- Programmes are valued by the institution.
- Entrepreneurship is disseminated into technical/natural science departments and humanities departments.
- Institutions are able to provide students with a diversity of learning experiences;
- Reward mechanisms are in place in the institution, and there is recognition of entrepreneurship-related activities undertaken by teachers and students.
- The field of entrepreneurship is given academic esteem: there are good research programmes and PhD programmes to educate the teachers.
- Quality assurance procedures are generally in place.
- Universities are properly integrated in their territorial, economic and social environment and interact with all stakeholder groups.
- The institution has a clear intellectual property policy, which encourages entrepreneurial endeavour.

Level of educators:

- Professors and educators are committed to entrepreneurship.
- Professors and educators are highly qualified, and academic expertise is integrated by practical experience;
- The focus of teaching is not only on start-ups, and the concept of entrepreneurship is not simply equated with business.
- Student-led approaches are encouraged.
- Links with student associations are encouraged, as is the contribution of alumni.

5. SOME EXAMPLES OF GOOD PRACTICE

This section gives examples of possible approaches and methods that can be used in teaching and disseminating entrepreneurship within higher education, as proposed by the members of the Expert Group.

These examples reveal a diversity of objectives, targets, methods and solutions (highlighted in a short introduction describing the specific “issue”). They are proposed here not as the best in Europe (a full list of good practice examples would be much longer), but as a meaningful selection of diverse cases.

1. Issue:

Promoting the dissemination of entrepreneurship at a regional level, bringing together different universities and the local community in a common strategy.

Example:

- The Entrepreneurship House at Grenoble universities (France)

The objective is to **promote and disseminate entrepreneurship among students on the Grenoble campus**, and in particular:

- to raise awareness through teaching programmes (effect on INTENT)
- to provide assistance through the Entrepreneurship Network (effect on ACTION)

This is achieved by promoting entrepreneurship in the wide sense of the term: venture business, small business, trade, services, self-employment, social entrepreneurship, etc. Partnerships are established with the socio-economic environment: financing by the region and local communities; cooperation with the local organisations dedicated to start-up assistance.

Methods used are:

- entrepreneurship courses;
- conferences and seminars for the students;
- “*Doctoriales*” (PhD seminars);
- Annual Business Plan Competition;
- information and assistance for students from the business idea to the project proper.

Major characteristics of this initiative are:

- a joint initiative by the four Grenoble Universities;
- courses inside the academic syllabus for all students (not only Management or Business) — inter university degree: Bachelor, Master’s and PhD level;
- a space on the campus dedicated to Entrepreneurship for all students;
- the Entrepreneurship House includes a student association founded in 2004 (in partnership with the Association of student entrepreneur clubs of Quebec: ACEE).

Some **3 000 students participate each year**, and 50 courses are set up inside the academic syllabus in the **four Universities**. Around 15 students or graduates create a new business each year. Based on the “Grenoble Entrepreneurship House” (created in 2002), six new regional

“Entrepreneurship House” projects in France have been launched since 2004: Nantes, Limoges, Poitiers, Aix-Marseille, Lille, Clermont-Ferrand.

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2. Issue:

A nation-wide entrepreneurship programme, offering to all higher education institutions teaching tools and material with a view to disseminating entrepreneurship education in the country.

Example:

- Dynamic Entrepreneurship, Leon Kozminski Academy of Entrepreneurship and Management (Poland)

This is a **nation-wide programme to enhance entrepreneurship education in higher education institutions** in Poland, especially within non-business studies. Poland is an emerging economy with very limited prior experience in this field. Rather than waiting for individual efforts from each university, the Programme established a nationwide network platform and provides tools and mechanisms for the fast-track introduction of entrepreneurship courses, primarily at polytechnics, universities, agricultural schools, etc.

The Programme was initiated in 2004 to develop methodology and tools for teaching entrepreneurship courses at the academic level in Poland. First the teaching methods, tools, cases, etc were tested at the Kozminski Academy (business school) and as part of the **EU-funded project** for 120 students from 32 higher institutions (mostly non-business) in the Mazovia Region. This led to the preparation of a modern-style textbook addressed to the academic community, published in 2006. At the same time a dedicated portal was developed and today serves a variety of functions: it offers supplementary materials and tools for students; it features teaching tips and materials for lecturers; it also serves as a database of teaching materials and cases; plus it provides a facility for running courses (blended learning) by lecturers from various universities who do not run their own websites. The portal streamlines the exchange of experience, materials, and other resources among lecturers who join the network. Later the ‘training of trainers’ component was added to the Programme. With the financial support of the Ministry of Science and Higher Education, 20 entrepreneurship lecturers from polytechnics, universities and agricultural schools were trained and received ongoing methodological support in launching pilot courses in entrepreneurship, which will later constitute an integral part of the teaching curricula of participating academic institutions. In addition to the basic course in entrepreneurship, new specialised courses have been developed, such as International Entrepreneurship and Technology Entrepreneurship (for PhD students), with the aim of sharing experience with lecturers joining the network.

Course-related **methodology:**

- a) Focus on high-potential, dynamic, innovative entrepreneurship as a distinct segment of the small business sector.
- b) Blended learning plus textbook. Traditional classroom workshops combined with additional web-based tools and materials and the ‘paper’ textbook, which is in high demand among students.
- c) Focus on the local business environment. All cases, tools, business environments reflect current Polish market conditions, and are therefore more attractive to students.

Since the beginning of 2006, when the Programme became fully operational:

- a) Over 1000 students have been trained in entrepreneurship with the use of the methodology, tools, electronic platform and the textbook generated by the Programme.
- b) Pilot entrepreneurship courses have been launched in some 30 higher education (mostly non-business) institutions throughout Poland. None of these institutions had prior experiences in teaching entrepreneurship.

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3. Issue:

Improving inter-disciplinary cooperation between students in different fields, with a view to developing technical innovation and turning it into a viable business idea.

Example:

- Innovation Lab, Johannes Kepler University Linz (Austria)

Innovation Lab seeks to boost entrepreneurial motivation and competences and enhance cooperation between students from different fields of study. The specific goal is to carry out a feasibility study for technical innovation in an academic context. To do so, interdisciplinary **teams with entrepreneurship and engineering students** are established.

Courses in both faculties create a package which highlights the entire process of new product development from the manager’s and the engineer’s point of view. A technical product idea in the innovation lab usually has to undergo three steps: generating the idea itself, developing it in terms of business and market potential, and creating a prototype.

The Innovation Lab consists of **three modules** (one-semester courses).

- Module 1 is a one-semester course for engineering students. Here it is the student’s task to develop innovative technical product ideas.
- Students are encouraged to take a look at their idea from an entrepreneurial point of view too. To do so, they attend module 2, a course run by the institute for entrepreneurship and organisational development. Module 2 starts shortly after module 1 and generally deals with analysing business ideas. Here the engineering students and their product ideas become part of a team of students of entrepreneurship. The task for this team is to carry out a feasibility study of the product idea. To do so, market analysis, field research and

calculations are undertaken by the students. This is a credit-bearing course for both faculties.

- The result of modules 1 and 2 is not only a technically and entrepreneurially developed business idea, but also a forecast of the potential profitability of the idea. Both results are combined in a written “opportunity plan”, which is a first step towards a business plan.
- The third module is optional and again focuses on the technical aspect. Here the students are given the opportunity to use the technical infrastructure of the university and money provided by an academic incubator to construct a first prototype. This takes the new product development process a step further.

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4. Issue:

An “Entrepreneurial University” where students of all disciplines are encouraged to think and act in an entrepreneurial way.

Example:

- *The “Entrepreneurial University”, Technical University of Munich (Germany)*

With its profile of sciences, engineering, medicine, and life & food sciences, the Technical University of Munich (TUM) has chosen to dub itself “The Entrepreneurial University”. The TUM seeks to provide an entrepreneurial setting, where students of all disciplines are encouraged to think and act entrepreneurially. It therefore offers a great variety of interdisciplinary research and education.

The *KfW* Endowed Chair in Entrepreneurial Finance and the *UnternehmerTUM* are the central institutions for entrepreneurship education on a **scientific** and **applied level**. Both offer training for business students and for science, engineering and medical students. The two institutions offer the opportunity to get a deeper understanding of the issues underlying the term “entrepreneurship”. The great advantage of the two institutions is that the TUM can offer on the one hand a profound scientific background with the lectures and projects of the *KfW* Endowed Chair in Entrepreneurial Finance. In addition, the TUM can provide an applied and more practical approach through the *UnternehmerTUM*. Both institutions offer a wide variety of lectures, seminars and hands-on approaches for students from all faculties to engage in the topic of entrepreneurship. A special focus is placed on interdisciplinary training, and students from all faculties are encouraged to join the courses and work in interdisciplinary teams.

- *The KfW Endowed Chair in Entrepreneurial Finance:*

The chair offers lectures at graduate and undergraduate level, open to all students in the university (mainly Entrepreneurial Finance, Venture Capital and Private Equity, Debt Financing, Venture Valuation).

For those interested in the scientific basis of entrepreneurship, special seminars with varying topics are offered. Recent examples have been “Social Entrepreneurship”, “Recent Developments in Private Equity and Venture Capital Markets”, “Financing and Valuation in the Biotechnology and Pharma Industry” or “Private Equity Funds and their Portfolio Companies”.

In addition, case study seminars enhance problem-solving skills and the creativity of the students. Real-life case studies, which have been written by members of the chair’s team, are given to the students, who have to work in teams to come up with a solution. The results are presented in class or to a jury with members of faculty and of the company.

A particular feature of the TUM’s business student education is project study. Teams of usually two to four students get a real-life project in cooperation with a project partner from industry, in which they have to provide solutions as consultants to the partner. Many of these solutions are later used within the company and hence have a real impact. The chair is constantly seeking interesting partners from an entrepreneurial background (e.g. young companies, venture capitalists or social entrepreneurs) offering an opportunity for students to gain hands-on experience.

The KfW Endowed Chair in Entrepreneurial Finance teaches some 150 students every year.

- *The UnternehmerTUM:*

UnternehmerTUM offers Business Plan Seminars to all students and researchers at TUM. In interdisciplinary teams, business plans have to be written and are evaluated by the lecturer and presented and discussed in class. The teams are also encouraged to hand in their business plans to the Munich Business Plan Competition.

Another important course offered is the “Innovative Entrepreneurs” lecture. A wide range of guest lecturers report their real-life experience as entrepreneurs and managers. Key focus is to teach skills that can enable students to make successful decisions in an entrepreneurial context.

On a second level, the *UnternehmerTUM* has established an extracurricular scholarship for TUM students called “Manage & More”. For this 18-month programme, 20 students (including PhDs) are selected per semester from all TUM faculties. Alongside their university courses, these scholarship students gain qualifications in business skills which guarantee them a better start in their professional careers, either as entrepreneurs or intrapreneurs. Corporate partners provide the scholarship students with a personal mentor to offer guidance and support. Main focus is on interdisciplinary innovation projects in which the students develop and market new products and services on behalf of corporate partners or with a view to creating their own businesses.

UnternehmerTUM addresses some 1 000 students each year through its courses and programmes.

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5. Issue:

Entrepreneurship is taught by way of a practical project: a simulated enterprise created and run by mixed teams of students from different disciplines.

Example:

- Practice Enterprise Project, Turku University of Applied Sciences (Finland)

The overall goal of the project is to give a practical understanding of the basic processes of running a company, from start-up to daily operations, bringing together students from different disciplines.

Every year more than **200 students** take part in the **Practice Enterprise project** in Turku University of Applied Sciences. Practice enterprise is a simulated enterprise formed by students from different disciplines and with a different cultural background. There is a real enterprise backing the simulated practice enterprise, in order to support planning and to provide real-life information for business start-up. The actions, products and services of the practice enterprise are similar to those of the real business. Practice enterprises do business with each other in a global network. The project lasts for 25-30 weeks and is divided into three phases: start-up phase, business phase, and closing the books and evaluation phase.

The Practice Enterprise project is based on applied problem-based learning and learning-by-doing approaches. Student groups are given problems and tasks, with initial information and sources for additional information. Learning in a practice enterprise is based on individual work and on interaction in student groups. The role of the tutor in the practice enterprise is to act as mentor and consultant for the group. The assessment is based on interactive methods: self-assessments, group assessments, peer assessments and process assessments.

The Practice Enterprise project is therefore a learning-by-doing teamwork activity that provides a realistic experience of starting up a company and of running daily business operations. The project brings together students from different fields of study (engineering, business, health care, transport, etc) who do not usually interact in a learning environment. This makes it possible to pool a range of knowledge and experience. The project is run in close co-operation with local companies, banks and public organisations to bring in more realism to cases, tasks and problems.

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6. Issue:

Creative studies require a business component: even for people aiming to be music teachers, self-employment and short-term contract work may be part of their graduate career.

Example:

- Entrepreneurship in the Creative Industries at University of Strathclyde, Hunter Centre for Entrepreneurship (UK)

The **Department of Applied Music** recognised that it needed a stronger business component in its degree and that, even for those aiming to be music teachers, self-employment and short-term contract work was likely to form part of their future career paths.

This course was developed at the request of the University's Department of Applied Music, located in the Faculty of Education, which was conscious of the need to incorporate some 'business' into its degree course. The Applied Music course teaches students how to 'produce' music — as performers, composers or producers — but not how to build a career in the music industry using these skills. Consequently, most students expect to become music teachers. However, most students on the course are also very entrepreneurial in the sense of using their skills to acquire income as performers or private teachers. Moreover, entrepreneurial skills are needed to thrive in the creative industries. The teaching is targeted at the 20 or so students on the course, but any student from across the university can enrol.

The course, which was launched in 2005-6, has five main themes:

- An introduction to the creative economy and main features of creative businesses — how people can make a living as business owners in the creative economy.
- The skills and attitudes of the entrepreneur.
- How to identify opportunities and what makes for a 'good' opportunity.
- The role and nature of intellectual property. The creative industries have a strong intellectual property component. Indeed, this is often the key competitive advantage of a new business. So how can intellectual property be protected and exploited?
- Financing the business. Traditional funders are often wary of the creative industries because of the intangible nature of their output and the lack of commercial awareness of many business owners in the sector. So what sources of finance might be available for creative industries entrepreneurs, and how might they be persuaded to invest?

For their assessment students were required to write up an interview with an entrepreneur, write an essay on what is required and involved in making the transition from a part-time performer or band to a full-time professional business, and a group assignment to identify a business opportunity. One of the groups, which drew upon their Music Technology course to develop a business idea for a web facility capable of offering online musical accompaniments to musicians, won 2nd prize in the Undergraduate category of the 2006 Scottish national student business plan.

The course is a customised version of the Centre's New Venture Creation course. Customisation involves some background on the creative industries, creative industry case studies and an emphasis on problems specifically facing the creative sector (e.g. the nature and protection of IPR, raising finance). However, beyond this customisation, it has not proved necessary to fundamentally change the approach to meet the needs of the creative sector.

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7. Issue:

Traditional exams are replaced by an enterprise project in the social sector, such as organising an event for charity, thus offering value to the community.

Example:

- Social Entrepreneurship and the Student, Dublin Institute of Technology (Ireland)

As part of a degree programme at DIT, instead of sitting an exam **students are required to organise an event for charity**. The scale of the event is open to the students, but they must organise and manage the whole event themselves.

The students arrange themselves into groups of three. They are given approximately three months in which they must:

1. identify a charity that they wish to support;
2. generate and select an idea for a charity event;
3. secure a suitable venue;
4. get sponsors for the event;
5. develop and implement a marketing strategy;
6. sell tickets for the event;
7. organise every element of the operations;
8. determine the budget for the event and manage the finances;
9. review the success of the event;
10. write a report individually on their learning experiences.

As it can be seen from the activities that students are required to undertake as part of the assignment, almost **all aspects of running a business are included within the event**.

There is no other such practice-within-entrepreneurship education in Ireland. This approach is highly practical and it means that the classes become workshops supporting the organisation of the charity rather than traditional lectures. It also means that lessons being learned from other business subjects can be utilised within this course, and that students of all abilities have the opportunity to demonstrate initiative and organisational skills.

This approach to entrepreneurship was introduced only two years ago, but already the results have been remarkable. Course evaluations have rocketed as the students feel that they are learning much more effectively, plus they greatly appreciate the opportunity to do something for real. They have also spoken repeatedly about how much they have enjoyed helping people less fortunate than themselves and that they had never realised that entrepreneurial skills could be used in that way. The demand for the course has increased significantly each year since its inception.

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8. Issue:

A Master's study in entrepreneurship for engineering students, aimed at turning technical innovations into concrete business projects.

Example:

- School of Entrepreneurship, Norwegian University of Science and Technology (Norway)

The NTNU School of Entrepreneurship is a **two-year Master's in entrepreneurship for engineering students**. The students are recruited from the third year of engineering study. 50% of the course is still directed towards engineering, but the other 50% focuses on entrepreneurship.

In the entrepreneurship part of the Master, students take appropriate courses, but a substantial part of the time they are working with a business development project. This starts in the first semester. Then they look for a business idea in conjunction with the faculty staff at NTNU, or in research institutions or businesses all over the country. They are primarily looking for interesting business ideas which currently lack an entrepreneurial team.

When the students have collected 20-30 ideas, they do the first screening in terms of technology, market and favourable relation to the inventors/owners of the idea. Together with a panel of experienced business people they end up with 3-5 ideas. Two to four students are teamed up around each idea.

In the second semester the students devise their first business plan.

In the summer semester all the **students go to Boston University (BU)**, where they attend courses in entrepreneurship and, under the guidance of faculty staff at BU, do further work on their business plans. The focus is on technology, market and financing, including identifying further possible partners.

The purpose of the summer semester is to give students business experience in a foreign business environment. Considerable changes in student behaviour have been observed as a consequence of this summer semester.

In the second year the students focus on special issues related to their business plan; issues which represent special challenges. As a result some of the business projects end up with very promising businesses. But the primary goal is to educate project leaders for promising new technology-based ventures.

There is evidence that university faculty staff and other places can be a repository of inventions with interesting commercial potential, but there is often a lack of experienced entrepreneurs and teams. NTNU School of Entrepreneurship tries to meet some of that need in Norway. The example illustrates the kind of action-learning programmes seem suitable for engineering students.

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9. Issue:

An integrated programme for promoting business start-ups within university; aim: to inform, train, accompany and advise students and researchers.

Example:

- *Enterprise Initiative Centre (CIADE), Autonomous University of Madrid (Spain)*

This scheme was started in 1998 with the aim of working with other players, in particular the Regional Government of Madrid, to foster business creation and self-employment among students. The University strategic plan 2003 – 2006 specifies the strategic objective of becoming an entrepreneurial and socially profitable university.

The Enterprise Initiative Centre, with the backing of *Fundación Caja Madrid*, offers support for all stages of business start-up within the institutional framework of the *Fundación General de la Universidad Autónoma de Madrid*, from the birth of an idea through to the consolidation of the resulting business venture. As this a non-technical university, subjects related to the Humanities and Social and Environmental Sciences have been a constant source of ideas and projects, making it necessary to develop a specific working methodology, and filling the void left by policies focusing exclusively on promoting technology-based companies. Furthermore, in departments such as Social Anthropology, Applied Psychology, Social Psychology, Geography, Archaeology, and in university services like the UAM Solidarity Office, there were research teams involved in an intense results-transfer activity likely to give rise to spin-off projects, either in commercial form or in non-profit-making bodies or Social Economy initiatives.

The method followed is an integrated one based on informing, training, accompanying and advising university students and research staff. Also, the Enterprise Initiative Centre is very active in research and technical assistance in all areas where entrepreneurship serves as a development tool.

Specific measures can be summarised as follows:

- Awareness-raising: action in the classrooms and research groups, aimed at spreading entrepreneurial values and identifying business opportunities.
- Training covering not so much business administration as such, but the specifics of the entrepreneurial process.
- Tutoring by experts and professionals from these sectors, with access to incubation services and specific network finance with the more significant regional entities. This service is used to assess the opportunity, the idea and the business model and to provide support to the entrepreneur in developing his or her business plan.
- Technical assistance in the process of company creation, everyday problems of business start-up, search for finance, premises, specialised staff, commercial and industrial partners, market development, internationalisation, and so on.
- The University Entrepreneur Prize offers special cash prizes to the best Human and Social Sciences project and to the best Social Entrepreneurship project.
- The School of Social Entrepreneurs, the aim of which is to provide a services platform to people promoting social initiatives in the geographical area of the University.

The CIADE covers all kinds of business initiatives developed within the university community or in partnership with related agents. It is an umbrella programme geared to all subjects and specialities, with special reference to the Humanities. Of the 111 companies set up to date with CIADE's help, 43% belong to the Humanities or are social projects. In the Humanities the principal area of business creation is education, with 43%; 13% environment and 23% archaeology & history, 13% NGO, 6% psychology, 3% music, 6% art, 3% others.

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10. Issue:

Building integrated competencies on innovation, entrepreneurship and technology, enabling students to create and develop new technology-based businesses, and ultimately bridging the gap between technology discovery and the commercialisation of innovative products and services.

Example:

- Entrepreneurship and Innovation Master Course (MIETE), University of Porto (Portugal)

MIETE started in September 2004 with the support with of the HiTEC Centre Team at North Carolina State University. MIETE was conceived to **promote innovation and entrepreneurship through multidisciplinary teams**. It seeks to adapt to the profiles of candidates from different areas, such as Management, Engineering, Biotechnology, Sciences and Design. Throughout the programme, the teams develop key integrated competencies on innovation, entrepreneurship and technology that will ultimately enable students to create and develop new technology-based businesses.

MIETE is a practical “hands-on” approach to training taking real commercialisation problems, and enabling students to better grasp the actual innovation process and to go through the real experience of technology commercialisation. MIETE is very much oriented to the launching of new technology ventures by handling real technology commercialisation issues. The final objective is **to devise a sound and solid business plan ready to be analysed by investors by the end of the course**.

MIETE takes its participants through the entire venture creation process, by combining real training in the innovation process and technology commercialisation with the interaction of its students with researchers from different fields at the University of Porto University of Porto (UP). In MIETE, commercialisation teams, composed of MIETE students and researchers from the UP (not enrolled in the course), work together through the whole technology valorisation process and final commercialisation. This means that students are placed in a real innovation setting by having to interact with researchers and the market, and conduct the actual iterative innovation process of bringing a technology or product idea to the market in the form of a business plan. Researchers come from a wide range of areas within the UP,

including Medicine, Pharmaceutical, Sports, Biomechanics and Engineering. Moreover, MIETE receives students from a broad educational background and enables each of them to adjust the technical training to their needs. Students are allowed to select optional technical courses from all 2nd Cycles available at the University of Porto. This allows students from very different backgrounds to mingle in MIETE's multidisciplinary commercialisation teams.

The **methodology** is structured as follows:

Technology Optional/Elective:

- technology (optional subjects);
- product design.

Innovation Management:

- creativity;
- introduction to entrepreneurship;
- managing innovation;
- project/ training period / dissertation.

Marketing

Market Studies

Management:

- business creation and development;
- business construction;
- business construction project;
- business implementation project;
- organisational behaviour and leadership.

Business Development, Construction and Implementation Sequence.

So this course combines training in technology (any topic from the University of Porto) with Creativity, Development of New Products and Services and Management, where appropriate promoting the valorisation of technologies by means of commercialisation strategies and implementation through licensing or the creation of new businesses. MIETE aims to bridge the gap between technology discovery — conducted at faculties, research institutes, research units and firms — and the commercialisation of innovative technology-based products and services.

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6. HOW TO MOVE FORWARD: A STRATEGY FOR ENTREPRENEURSHIP EDUCATION

6.1. Evaluating quality, effectiveness and impact

6.1.1. Evaluating quality and effectiveness

Quality assurance, and the evaluation of programmes, courses and activities on offer, should form part of the general internal and external quality assessment frameworks of an institution. These should be managed in line with the standards agreed by countries which have signed the various declarations under the **Bologna Process**. Thus, as with all other academic programmes, the European Standards and Guidelines for Quality Provision of Higher Education²⁵ should be a standard reference text. As far as course design and delivery are concerned, the ENQA guidelines stress the importance of attention to such things as:

- relationship between teaching and research;
- development of explicit learning outcomes;
- specific needs of different modes of delivery (e.g. full-time, part-time, distance-learning, e-learning) and types of higher education (e.g. academic, vocational, professional);
- availability of learning resources;
- formal programme approval procedures by a body other than that teaching the programme;
- monitoring of the progress and achievements of students;
- regular feedback from employers, labour market representatives and other relevant organisations;
- participation of students in quality assurance activities.

Learning outcomes should be established at the programme design phase, and outcomes should essentially be measured against these. Tools such as tracer studies and student questionnaires can be particularly useful here.

Entrepreneurship programmes can have **different objectives**: developing entrepreneurial motivation among students, training students to set up a business (planning, networking, selling, finding resources, etc.), developing the entrepreneurial skills needed to identify and exploit opportunities.

Evaluation must therefore be **adapted** to the objective and to the entrepreneurial competencies to be developed. The quality of the programme needs to be assessed according to the objectives fixed. Ideally, planning the evaluation work is a process that starts with programme design.

If the objective is to develop the entrepreneurial intention, the programme quality can be assessed through a questionnaire assigned to students to understand their perceptions of entrepreneurship, their self confidence to engage in an entrepreneurial activity and their perceptions of their capacity to detect opportunities and to exploit them.

If the objective is to learn how to engage in start-up activities, the evaluation can be based on students' performance in developing and presenting a business plan and their capacity to sell their project.

²⁵ <http://www.enqa.eu>

However if the objective is to develop soft entrepreneurial skills (*see Sections 1.1. and 3.2.*), it will be more difficult to assess the quality of the programme, as little is known about the required entrepreneurial competencies and how to measure them. In this case, the assessment of the programme quality should be related to the pedagogies and the methods used.

There are quantitative and qualitative strategies to address this issue. **Quantitative strategies** refer to measuring the number of actions, students involved, and more generally measuring the number of students who want to take the course.

Qualitative strategies refer to:

- measuring ex-post the participants' degree of satisfaction;
- measuring the entrepreneurial intent of students ex-ante and ex-post. This is a way of evaluating the potential impact of specific actions on participants' "mindset".

The evaluation should cover **students' experiences and outside assessment**. Of primary importance is the **feedback** from students who participated in the entrepreneurship programmes. Methods will include collecting qualitative feedback from students (evaluation forms), and running surveys beforehand and afterwards.

The difficulty in finding proper solutions is shared by all European countries, so such solutions should preferably be developed together. The use of indicators that are widely applied in different studies and in specific programmes would facilitate comparison across programmes and across countries²⁶.

Some possible **indicators** suggested by the Experts are:

- number of students who want to take the course, and/or rate of increase in the number of participants;
- diversity of participants (from different departments and fields of study);
- percentage of former students who would recommend the course;
- percentage of students taking the course who believe that it has made a significant difference in the way that they think about entrepreneurship (change of attitudes);
- perception of students of their own confidence and ability to start a company (before the course, and afterwards);
- number of business plans written (which should take into account the rate of success, e.g. the rate of companies started)

6.1.2. Evaluating the impact

In theory, the most effective way of assessing the impact of entrepreneurship education on society and on the economy should be the extent to which participants get involved in entrepreneurial activities after the programme (i.e. starting up a new business, or taking over an existing one). However, graduates' start-up is only one among possible outcomes of entrepreneurship education. In fact, qualities like creativity, innovation and entrepreneurial

²⁶ See also the study funded under the EU programme "Leonardo da Vinci": Evaluating and measuring Entrepreneurship and Enterprise Education, by U. Hytti and P. Kuopusjärvi, 2004. More information available at: www.entreva.net

initiative can be applied to a much broader context, contributing to young people's personal and professional development in any field, including as employees in a company or in the social sector. This makes it of course extremely difficult to measure the impact of such programmes at all levels.

As regards assessing impact based on students' new start-ups, one practical problem is the time lag between the programme and the realisation of the entrepreneurial activity. Moreover, not all higher education institutions engage in effective alumni tracking, without which it is difficult to get an overview and to measure the long-term impact.

To cope with that situation, in **Belgium** the FREE Foundation is considering equipping each participant in an entrepreneurship programme (including in secondary school) with a dedicated e-mail account, to make it possible to trace students, keep contact with them, identify whether they get involved in some entrepreneurial activity, and build a community for entrepreneurship.

A basic starting point might be the **number and quality of the start-ups** from universities or universities of applied sciences, although the various types of institutions should be differentiated (e.g. business school vs. technical university). A further criterion is the **number and quality of new workplaces** originating in start-ups from universities and colleges. However, a global measurement of business creation by students is very difficult to manage. What is easier to measure is new business **creation through incubators or dedicated programmes**.

More generally, an indicator that could take into account the complexity and the different objectives of entrepreneurship education is the **level and quality of employment of students** who have taken entrepreneurship modules, not restricting the analysis to graduates' start-ups only, but considering any route of professional development.

Finally, **changes in the entrepreneurial culture** in a region or in a society cannot be measured reliably on a short-term basis, but only in a longitudinal perspective (long-term study), based on a sound, scientific methodology.

The following **indicators** are among those proposed by the members of the Expert Group as effective means of measuring the impact of entrepreneurship courses, programmes and activities. This list should not be considered as exhaustive. Also, in concrete terms it may be very difficult to use some of these indicators, due to the non-availability of comprehensive data.

- 1) *Number of start-ups created by students who have taken entrepreneurship modules (within 5 years)*
- 2) *Number of jobs created by the above new start-ups*
- 3) *Number of new patents issued as an outcome of entrepreneurial modules*
- 4) *Level and quality of employment of students who have taken entrepreneurship modules (after 5 years)*
- 5) *Number of new companies founded by the overall population of university graduates*
- 6) *Progress in entrepreneurial attitudes, perceptions and intentions of:*

- *students taking entrepreneurship modules (before and after the programme, and compared to other target groups of students);*
- *the general population of higher education students.*

6.2. Levels of responsibility: designing a coherent strategy

6.2.1. The role of policy

Entrepreneurial thinking should be fostered as early as school and through all levels of education. The Ministry of Education, in cooperation with other departments (Economy; Employment; Science and Research), should establish a **task force** to determine how entrepreneurship can be integrated into the education system across primary, secondary, and higher education. The task force would also need to get the viewpoints of other relevant organisations. This should lead each Member State to develop a **coherent national strategy** for entrepreneurship education, clearly linked to an agreed framework of desired outcomes. National observatories could be established to track change, trends and impacts of entrepreneurship education in each country.

In **Denmark**, the creation of a ‘vision group’ by the Minister of Education in 2001 resulted in a number of new initiatives, including a portal for entrepreneurship teaching, the establishment of a new public-private foundation for entrepreneurship focusing on primary/secondary schools, and in 2004 the establishment of the International Danish Entrepreneurship Academy (IDEA), dedicated to entrepreneurship teaching in higher education (38 universities and colleges are IDEA partners, including both business and non-business institutions/faculties). Since 2005 a number of new initiatives have been generated or supported by IDEA.

As part of this global strategy, governments should adopt legislation supporting relations between private business and universities. This would include, where necessary, creating a legal framework to allow professors to **work part-time with business**, or removing existing obstacles.

However, legislation alone will not be sufficient. For many institutions, practice-based methods that are effective in teaching entrepreneurship are too expensive to be sustained within normal internal budget systems. So the role of public authorities might also be to create **funding mechanisms** to support institutions in developing action learning programmes, leading in turn to new venture creation. Different departments of the public administration could set up a joint programme to underpin the above legislation and add a financial budget to it, also involving business organizations.

The demand for learning about entrepreneurship is increasing, but there is a shortage of human resources and funding. A priority is therefore to organise specific funding for this type of education. This would also include seed funds for students’ start-ups. Also, there is in general a shortage of educators with the specific competences needed to teach entrepreneurship effectively. **More training is needed**, and scholarships could be granted for **PhD theses** on entrepreneurship, in order to encourage a new generation of professors in this field.

Increased funding from the government can enforce **change within the universities** from the outside. One main obstacle within institutions is decision makers' lack of interest and backing. Policy-level changes to funding — for instance a resource allocation influenced by performance in entrepreneurship education activities — would have an immediate effect on institutions' behaviour and on the internal allocation of resources. The **evaluation of institutions, departments and staff** should be based not only on publications, but also on entrepreneurial teaching and activities as well as, for technical and scientific departments, on patents produced. There is a need for pressure from within (interested students and teachers) combined with political pressure from the Government.

In the **UK**, the introduction of successive rounds of new **funding for universities**, the Higher Education Innovation Funds (HEIF) in 2001, 2004 and 2006/7²⁷ and the Science Enterprise Challenge (SEC) Fund in 1999 and 2001²⁸, impacted significantly on institutional behaviour and supported new developments in enterprise and entrepreneurship back-up, including curricular innovation.

Focused on embedding enterprise within science and engineering faculties, 13 SEC-funded centres were created within universities. Between September 1999 and September 2003 these centres collectively achieved the following: 45 000 students educated (35 000 undergraduates); 1 800 education professionals trained; 1 000 start-ups supported; 760 licences filed.

Within institutions, a real challenge is to create **inter-disciplinary approaches**. Therefore decisions at the policy level should take this need into account, and promote merit transfer across institutions' internal and external boundaries, making it easier for them to accept cross-disciplinary initiatives and courses. This is important as funding of departments and faculties today often follows the students and depends on exams passed in the department/faculty. There may therefore be a disincentive in encouraging students to follow courses organised by other units, and this possible obstacle needs to be counteracted. In this respect, many Rectors will also appreciate a **greater degree of autonomy**, which will allow funding to be transferred between faculties.

In entrepreneurship education, an important role is played by the spontaneous initiative of students and student associations, and a large part of activities take place outside curricular courses (for instance, a recent survey carried out in the **UK** shows that 64% of provision of enterprise and entrepreneurship activity in higher education is extra-curricular²⁹). While the autonomous initiative of students — individually or within associations — should of course be preserved and encouraged, education authorities could help to develop an **accreditation system** to validate informal learning and practical activities that favour entrepreneurship development. Students should receive credits for their regular and successful work.

A coherent strategy could also include supporting business plan competitions among students, followed by regional, national and European **awards** for celebrating and sharing successes. In order to promote and value good practices, and to raise the profile of such initiatives within

²⁷ <http://www.dti.gov.uk/science/knowledge-transfer/heif/page12054.html>

²⁸ http://www.dti.gov.uk/science/knowledge-transfer/schemes/Science_Enterprise_Challenge/page12138.html

²⁹ Enterprise and Entrepreneurship in Higher Education, Report by the National Council for Graduate Entrepreneurship, 2007.

society as a whole, awards for the most entrepreneurial universities, teachers and students could be established, and positive examples of academic spin-offs highlighted.

In the **Czech Republic** a popular competition called “Czech Head” for scientists and researchers — with one sub-programme devoted to students — is organised every year, granting national awards. This competition is widely covered by the Czech media (TV and important newspapers).

In **Greece**, the Ministries of Education and Development organise a national business plan competition for students who have followed entrepreneurship programmes at university. This is in close cooperation with businesses and successful entrepreneurs. After that, the Ministry for Development — under an open call for young entrepreneurs — offers students the chance to realise their business ideas.

More specific **promotional campaigns** should target the Science, Engineering and Technology community with a view to informing and convincing Deans of non-business faculties of the relevance of entrepreneurship education. Where relevant, public authorities should also help set up clear **rules for intellectual property rights** for the ownership of inventions at university.

At the level of regional or local authorities, **Regional Centres** could be created to take responsibility for coordinating, organising and promoting entrepreneurship measures (e.g. “*Houses of Entrepreneurship*” in **France**, as in the example of the **Entrepreneurship House at Grenoble universities** in *Section 5*). These centres could build up a critical mass of activities at a local level, encourage the sharing of best practice and tools, provide support for networking among educators, entrepreneurs and students. Action would include training for teachers, and mobilising entrepreneurs to get involved in the classroom.

While innovative teaching approaches to entrepreneurship training within universities are being tested throughout Europe, sharing of practices should be increased. At both national and at European level, there should be support for entrepreneurship **network organisations** (like IDEA in **Denmark**, NCGE in the **UK** and FGF in **Germany**). These serve as platforms for the exchange of information, e.g. between teachers, scientists, experts and entrepreneurs. There is a need to promote international networks of higher education institutions, and the development of joint study programmes.

The European Commission could be one of the possible players in **supporting cross-border exchanges and training for educators in entrepreneurship**. This would include encouraging the mobility of teachers across Europe for short periods of placement in institutions in different countries, and supporting summer schools for a one-week exchange of experience among entrepreneurship professors and the sharing of case studies and methods. Also, a **modified “Erasmus” scheme** would allow **students** with a viable business plan to relocate to a foreign partner who can offer to support the idea development, and possible links to the appropriate regional cluster or to the well equipped laboratories.

The **EU Structural Funds** (2007-2013) can provide financial support for entrepreneurship programmes and activities in higher education (as is the case in **Greece** and **Poland**). Action may also include the mobility of teachers and researchers from education to the business world, and support for students' business ideas (**Poland**). Also, from 2007 the **EU Lifelong Learning Programme** has entrepreneurship among its main objectives, and includes a specific action line on university-enterprise cooperation.

As part of its coordination role under the renewed Lisbon Strategy for Growth and Jobs, the Commission should regularly **benchmark** public policies in this area, and monitor entrepreneurship education activities in the Member States.

6.2.2. The role of higher education institutions, and of educators

Higher education institutions should have a **strategy** or **action plan** for teaching and research in entrepreneurship, and for new venture creation and spin-offs. This calls for the development of an “Entrepreneurial University”, a major change in the culture of higher education institutions, which will be evident in:

- the study programmes (multi-disciplinary programmes);
- working and learning methods (team work, initiative with the student);
- research strategies;
- personnel policy (recruitment practices, incentives & rewards, training);
- industry co-operation.

These requirements mean that rectors and senior managers must ensure that the appropriate institutional infrastructure is in place. Entrepreneurship education makes particular demands on quality assurance, human resource management, student support, knowledge transfer, management information, and governance systems.

An entrepreneurial university is one where entrepreneurship is a systematic approach, and where people feel committed to this goal. There is a need for opinion leaders who would push the change from the inside the institution. As a first step a member of the governing body could be identified as the person in charge, as only a decision maker can decide on the outcomes.

The **Technical University of Munich** (Germany) adopted the motto “The Entrepreneurial University”, and students of all disciplines are encouraged to think and act entrepreneurially (*example in Section 5*).

In **Wales**, every university and college now has its own “**Entrepreneurship Champion**” funded by the Knowledge Exploitation Fund (part of the Wales Assembly Government). These senior members of staff are tasked with promoting a new culture of entrepreneurship among students and academics. Their role includes: building entrepreneurship into the curriculum; facilitating support for new business start-ups by graduates; establishing support networks for local entrepreneurs and students; helping to commercialise the results of research and intellectual property owned by institutions.

In order to embed entrepreneurship within the whole institution and across the curriculum there may be different **options**, such as:

- a) a campus-wide approach, embedded in all faculties/schools;
- b) a faculty-driven central unit servicing other faculties (the Business School, or a Centre for Entrepreneurship);
- c) the use of a non-university provision that is partially owned by the university.

A **Centre for Entrepreneurship** (or other focal point) would have the aim of spreading entrepreneurship throughout the institution. It is essential for it to have powers to liaise with all other departments and faculties within the institution. It should essentially have two roles:

- 1) offer entrepreneurship training in the form of single credits (ECTS), modules and entire courses, if necessary in collaboration with the economics/management departments/faculties within the institution;
- 2) work together with all departments and faculties (both students and academics) to help them realise and exploit any entrepreneurial potential their programmes may offer.

Typical services might include:

- helping researchers to explore the commercial options of their research;
- working with staff and students on developing their ideas, projects, etc.;
- identifying, protecting and exploiting intellectual property;
- licensing IP to multinationals, SMEs and start-ups;
- advising start-ups on their business development;
- assisting inventors in commercialising their ideas;
- providing incubation space;
- getting actively involved in campus company development;
- developing SME linkages with the university;
- giving access to networks;
- matching ideas and inventions with experienced entrepreneurs (and vice versa).

These services should be available to students of all courses, in order to foster their entrepreneurial spirit. Setting up enterprise / entrepreneurship centres that service all faculties sends out a message to all stakeholders within the academic community that such work is not faculty-specific.

Obligatory introductory activities or modules should be offered for all undergraduate students during their **1st year**, influencing their mindset right from the beginning and creating awareness of the alternative career option as an entrepreneur. In addition, all students should be given the opportunity to attend seminars and lectures on this subject. Optional courses which are open to students from different faculties and disciplines, and involve these students in team based project work, are a useful means of spreading entrepreneurship across faculties and departments. Students who find the field interesting and attractive and who seek to get involved in voluntary entrepreneurship initiatives should be backed by the institution or facilitating organisations. **All students should be exposed to the opportunity of acquiring entrepreneurship-related teaching and experiences.**

At **Wuppertal University**³⁰ (Germany) entrepreneurship education modules are offered as compulsory or optional classes in **all relevant undergraduate courses**. In addition, there is a specially designed Master's course called "Start Up, Innovation and Economic Development". Teaching is always highly problem-oriented, student-centred and interdisciplinary.

The Wuppertal approach to start-up promotion takes the form of a value chain. As in a funnel, students will become acquainted with entrepreneurship issues in a diversified but not particularly profound way during their first semesters. Later on, more specific modules will follow which incorporate the perspectives of various subjects on entrepreneurship issues. The course is on the one hand designed for students of Economics and on the other hand — in a separate module — for students of other departments such as Engineering, Natural Sciences, Architecture and Design. Both groups will meet in specialised classes such as business plan seminars and case study training.

Learning about entrepreneurship assumes a **student-centred form of teaching**, in which learning outcomes are clearly specified. It also assumes that, beyond the introductory modules, students will themselves select which road to follow. This will require flexible course structures, a problem-solving approach supported by qualified academic staff, extensive learning resources, opportunities for work placements, and access to funding.

For **teachers** who are interested in the field, more training, in terms of theory and of innovative pedagogy and didactics, is needed and new teaching tools/methods tailored to the specific field of study will have to be developed. Some options for **enhancing educator capability** include: staff sabbaticals in enterprises, and for entrepreneurial development; curricula development funds; exposure to role models and examples; incentives, rewards and recognition; international educator exchanges; bursaries and support for personal development through educational programmes.

Institutions should have **incentive systems** for motivating and rewarding faculty staff, researchers and teachers in supporting students interested in exploiting business opportunities. Staff promotions should be also linked to entrepreneurship, among other criteria. Reward mechanisms should be set up, based on achievements in furthering entrepreneurship and innovation, such as: companies started by students, number of patents, number of industrial projects, etc. The rewards might take the form of academic promotion and of pay, based on financial resources obtained from projects. In general terms, the **academic value** of research and activities in the entrepreneurial field should be acknowledged, and the working time that professors devote to support students' initiatives recognized.

From the perspective of educators, the **teaching** should balance theoretical and practical aspects, making use of: inter-active and pragmatic methods; active self-learning; action-oriented pedagogies; group work; learning through projects; student-centred methods; learning by direct experience; methods for self-development and self-assessment.

Crossing the boundaries between different fields of study and different faculties/departments is a key to spreading entrepreneurship. One possible way is to **create inter-disciplinary "laboratories"**, in which students of business help put into practice business ideas of their partner students from faculties of technical and/or natural sciences. Where appropriate (for instance at Master's level), exams — or even the thesis — could be replaced with **work on**

³⁰ www.brauk.uni-wuppertal.de, www.koch.uni-wuppertal.de

projects, like a start-up project. Some students may be more motivated and better at working on concrete activities rather than writing.

At the **Dublin Institute of Technology** (Ireland), instead of sitting an exam students must organise an event for charity (*example in Section 5*).

Business representatives and entrepreneurs should be involved, and events organised where **entrepreneurs present their experience**. Ideally, they should come from the faculty / school where the event is organised. To boost awareness and motivation of students, it is fundamental to **use the power of examples** (alumni, successful entrepreneurs, etc.). There is a need for local champions. For instance, students in the field of science and technology will be attracted by cases of “technology entrepreneurship”, and not by entrepreneurship in general.

Entrepreneurship teaching should be part of a broader entrepreneurial environment within the institution, with services to support students’ business ideas. High visibility is achieved through dedicated spaces, support for student activities and awards/rewards for success. Institutions should set up **pre-incubators** (“hatcheries”) for undergraduate and graduate students, and provide access to on-campus or external **incubators** for graduates, post-graduates and researchers. There should be a **focal point** (‘one-stop shop’) within academic institutions that is well known to everyone (students and staff alike) and which acts as a central source of advice and information on business start-ups. With the help of additional funding from the government or from industry, **easy access to financial grants and seed/venture capital** should be available for students who want to develop a viable business idea, either within an on-campus incubator or as a follow-up to a business plan competition.

A useful measure would be to ensure access to “**entrepreneurship tutors**” for all students. These would complement the main tutor on a master’s or doctoral thesis, and offer advice as to whether there is a business perspective to the work, and if so, how to capitalise on it.

Institutions should encourage the spontaneous initiative of students; encourage and support the foundation of **student mini-companies** or junior enterprises³¹; **award academic credits** for activities carried out within student associations and for practical work on enterprise projects.

In **Belgium**, the FREE Foundation and the non-profit organisation “*Les Jeunes Entreprises*” started 11 “**Clubs of Student Entrepreneurs**” across higher education institutions. A Club is a group of students from different disciplines within an institution seeking to: raise awareness about entrepreneurship among other students in all fields of study; inform them about support services available to start a company; run enterprise projects; create business networks. Currently, some 500 students are members of these Clubs, organising entrepreneurship activities for thousands of students in different universities.

Universities should engage more consistently in **dialogue with entrepreneurs**, provide better information on the skills and learning outcomes of their graduates and **put in place systems to track graduate employment**. There is a need for long-term studies to identify students who have set up companies of their own after being involved in entrepreneurship modules.

³¹ JADE is the European Confederation of Junior Enterprises: non-profit associations entirely managed by students, integrating knowledge from universities with practical business experience by running consulting projects for companies in various sectors. Information at: www.jadenet.org

This knowledge would help in evaluating programmes and in assessing their impact, providing policy makers with useful evidence.

6.2.3. The role of other players, particularly businesses

Promoting entrepreneurship education in the community should be part of a common and coordinated effort. **Regional development agencies** and **university associations** should provide clear directions about what contribution institutions could make to regional social and economic development strategies. Universities should be considered as instruments of regional development.

There needs to be an increasing awareness that **cooperation between higher education institutions and enterprises** can generate a win-win situation for both parties. Teachers and students have something to contribute to enterprises, in terms of theoretical knowledge and also through the involvement of students in innovation ideas.

A few possible elements of **motivation** for enterprises in embarking on cooperation and joint projects with universities are:

- to get a job done — cheaply and well;
- to get expertise and advice from a tutor/professor;
- to test potential students for later recruitment;
- to get publicity (image building);
- to establish a channel of contact with the university, making it possible to keep track of new developments.

The “*Excitera Innovation Challenge*” is a student-run initiative within the **Royal Institute of Technology of Stockholm** (Sweden), with the objective of bringing together students and researchers around innovation projects of cooperating companies. The activity has a duration of eight weeks, with teams of up to three people. Ideas within a given technological area are presented to a jury, and the best projects receive a prize. Cooperating companies greatly benefit from the work carried out by students.

The best way to make firms aware of such benefits is to have other businesses tell them about it: businesses that are already successful in this area should share good practice. Companies can essentially offer would-be entrepreneurs exposure to the business world through internships, traineeships, etc, and more importantly by concrete support (in the form of financial and knowledge capital) in working on business cases and ideas.

As highlighted in *Sections 3.3.1* and *3.3.2.* of this Report, business representatives and entrepreneurs play (or should play) a crucial role in teaching entrepreneurship. Especially within the non-business fields of study, students need to be taught by practitioners who have experience on which they can draw, in addition to their specialist subject knowledge. They need role models, examples and to “see” the connection between their own subject and enterprise. The involvement of coaches or mentors from businesses is particularly important within project work, as students see them as representing the true aspect of entrepreneurship.

Higher education institutions are therefore urged to use industry placement extensively, and to give visiting professorships to outstanding entrepreneurs.

Successful entrepreneurs who dedicate time and effort to teaching normally do so mainly out of a sense of contribution to society, and as part of their social responsibility. A good way of encouraging their involvement in education is by demonstrating a clear appreciation of the work done by them in tangible ways, for instance by giving them public recognition and awards.

Business associations should encourage their members to get involved in teaching entrepreneurship within educational establishments, as well as to take an active role in organising business plan competitions and in providing support for getting the winning ideas off the ground. Industry should provide sponsorship and funding for high-tech spin-offs created by students, within incubators or as a result of business plan competitions.

6.3. Concluding remarks

The strength that gives higher education institutions an innovative capacity, and hence entrepreneurial potential, is their **autonomy**. Given the right framework conditions, entrepreneurial initiatives can be highly desirable for an institution, as successful initiatives lend the prestige to the institution. They can also help bridge the funding gap that is chronically facing most higher education institutions throughout Europe.

While diversity is richness, higher education institutions and educators will benefit from exchanges and mutual learning, open sources of information, and examples of good practice from across Europe. Coordination should be applied at a **policy level** to ensure that all higher education institutions are given the necessary incentives and opportunities to take on this challenge.

Entrepreneurial teaching should be highly valued in an institution, within the curricula of the different faculties, with reward mechanisms in place, qualified educators and a wealth of inter-actions with the outside world, in particular with businesses and entrepreneurs. In this respect, the development and delivery of entrepreneurship is significantly affected by the **internal organisational structure** of the institution. Irrespective of the individual objectives of a university or college, having more effective internal organisation structures is to be recommended.

Not all higher education institutions have the governance structures which would allow them to involve social partners, chambers of commerce and other external players in the design and delivery of enterprise programmes. Ministers at the 2007 London summit of the **Bologna Process** stressed ‘the importance of strong institutions, which are diverse, adequately funded, autonomous and accountable’³².

However, in very general terms even current structures can accommodate entrepreneurship education activities. The main problem is one of lack of personal commitment, when there is not enough interest and backing from decision makers in the institutions. In this sense, promotional campaigns could raise the awareness of Deans of non-business faculties: that is also one of the objectives of this Report. An **entrepreneurial university** is one where staff at

³² London Communiqué, para.1.5

all levels are committed, and students of all disciplines are encouraged to think and act in an entrepreneurial way.

This **Expert Group's Report** does not aim to prescribe a single strategy, which would be unrealistic. Its goal is rather to highlight some key issues, to identify existing obstacles and to propose a range of solutions, taking into account the different levels of responsibility (public policy, institutions and educators, relevant stakeholders). These are presented in *Section 6.2* and in *Section 7*.

The proposals included in this Report — despite being the outcome of the work of a group mainly composed of experts from the EU Member States — should not be considered as valid and useful only within the EU. In fact, problems are similar in other countries, especially in neighbouring countries. This work is intended to serve as a possible inspiration and source of ideas **within and beyond the boundaries of the European Union**.

6.4. Summary of some key findings

- In general, there is in Europe a **shortage of entrepreneurship studies within non-business institutions and disciplines**: entrepreneurship is not yet sufficiently integrated into different subjects of the curriculum.
- Available data from some European countries show **that the majority of entrepreneurship courses are offered in business and economics studies**.
- Coverage of entrepreneurship in non-business studies is particularly weak in some of the Member States from central and eastern Europe that joined the EU in and after 2004.
- While the demand for learning about entrepreneurship is increasing, there is a **shortage of human resources and funding** for this type of education, making it impossible to meet this demand fully.
- There are currently **too few professors** of entrepreneurship. There is a need to graduate enough PhD students in entrepreneurship who can become teachers.
- There is **very little in terms of incentives** to motivate and reward teachers for getting involved in entrepreneurial teaching and activities with students. It is currently difficult to build a career in entrepreneurship, as research remains the main criterion for promotion.
- Increased funding from the government can enforce **changes within universities**. Policy level changes to funding would have an immediate effect on institutional behaviour and the internal allocation of resources.
- The development and delivery of entrepreneurship is significantly affected by the **internal organisational structure** of the institution. However, in general terms even current structures can accommodate entrepreneurship education. The main problem is a lack of commitment on the part of decision makers within the institutions.
- **Faculties and departments are working quite separately**, with too many obstacles for students who want to move and for teachers interested in establishing cross-disciplinary

courses. A rigid curriculum structure is often an impediment to an inter-disciplinary approach.

- Although a wide range of methodologies exist — supplementing lectures as the most basic tool of teaching — there seems to be a **gap between the methods applied and those that are seen as the most effective** and appropriate.
- The use of experience-based teaching methods is crucial to developing entrepreneurial skills and abilities. **Traditional educational methods** (lectures) **do not correlate well with instilling entrepreneurial traits and attributes.**
- Methods seen as the most effective are based on “**group and team techniques for creating new business ideas**”, the use of “**case studies**” and “**business planning workshops**”.
- Crossing boundaries between disciplines, and **multi-disciplinary collaboration**, are essential elements in building entrepreneurial abilities.
- There is a need for greater **flexibility** in course design. Work placements, alternation between full- and part-time study, the organisation of intensive courses and the accreditation of informal and non-formal learning all have a role to play.
- A challenge lies in **integrating start-up activities** into degree studies, as they are currently mostly outside the curriculum and sporadic in nature. Business incubators exist in many cases outside university, for all starters. It is advisable but not essential for them to be embedded within universities: what is important is that students are linked and directed to them.
- If the business idea and/or innovation is developed inside the university, there will be basic problems as to **intellectual property rights** and to teachers’ role as civil servants (in some countries the law prevents teachers and researchers from working as entrepreneurs and exploiting innovations developed in the course of their work).
- The degree of **mobility of teachers and researchers** between higher education institutions and business is in general very low, and this practice is not encouraged. There are in many cases few or no incentives, or even disincentives. For instance, lecturers may be banned from taking part in external commercial activities.
- Although **entrepreneurs and business practitioners are in general involved in the teaching**, there are few examples of entrepreneurial practitioners engaged in the full curricula experience. Most frequently, they are only engaged in short presentations to students (e.g. as testimonials or guest lecturer) or as judges in competitions.
- European higher education institutions are not sufficiently involved and effective in **working with alumni**, who can bring back knowledge and also funds.

7. FINAL RECOMMENDATIONS FOR ACTION

Public authorities (framework conditions)

- 1) **Establish a task force** or steering group (including the Ministry of Education and other departments: Economy; Employment; Science and Research) to determine how entrepreneurship can be integrated into the education system across primary, secondary, and higher education. The task force would also get the viewpoints from representatives of other relevant organisations. This should lead Member States to develop a coherent national strategy for entrepreneurship education, clearly linked to an agreed framework of desired outcomes.
- 2) Adopt **legislation** supporting relations between private business and universities, including allowing professors to work part-time with business. A joint inter-ministerial programme with a **financial budget** should accompany the above legislation and support institutions in developing action learning programmes that also result in new venture creation.
- 3) Help develop an **accreditation system** to validate informal learning and practical activities that favour entrepreneurship development: students should receive credits for their regular and successful work.
- 4) Establish **awards for entrepreneurial universities**, teachers and students. Promote positive examples of academic spin-offs.
- 5) **Create Regional Centres** responsible for coordinating, organising and promoting entrepreneurship action (e.g. “*Entrepreneurship Houses*” in France). These centres could build up a critical mass of activities at a local level, encourage the sharing of best practice and tools, provide support for networking among educators, entrepreneurs and students. Action would include training teachers, and mobilising entrepreneurs to operate in the classroom.

Activities at the level of institutions

- 6) Institutions should have a **strategy and action plan** for teaching and research in entrepreneurship — embedding practice-based activities — and for new venture creation and spin-offs.
- 7) Institutions should embed entrepreneurship in all faculties. One effective way of doing so will be to establish an **entrepreneurship education department** responsible for disseminating entrepreneurship throughout the institution. This role should be played by the Business School, where there is one. Non-business higher education establishments should create a specialised administrative unit for dealing with all activities related to entrepreneurship (**Centre for Entrepreneurship**). Centres for Entrepreneurship should be entrepreneurial hubs within the institution, whose function is to spread the teaching of entrepreneurship across all other departments.
- 8) An **introduction to entrepreneurship** and self-employment should be offered — as part of career guidance — to all undergraduate students during their 1st year. In addition,

all students should be given the opportunity to attend seminars and lectures in the subject. Therefore, as a minimum requirement, all higher education institutions should provide **at least one entrepreneurship course**, and enforce structures that allow students to choose.

- 9) Institutions should have **incentive systems** for motivating and rewarding faculty staff in supporting students interested in entrepreneurship and new business start-ups, and should **acknowledge** the academic value of research and activities in the entrepreneurial field.
- 10) Develop clear **institutional rules about intellectual property**. Provide templates for use as a reference, and give examples. Comparative information on IPR rules applied by different institutions should be available for teachers, researchers and students. Good practice should be disseminated.
- 11) **Encourage the spontaneous initiative of students**. Existing students' organisations aimed at developing entrepreneurial projects and activities, and of building contacts with the business world, should be given the best conditions to operate and should be supported. Where relevant, Enterprise Clubs — supported by the faculty but operated by the students themselves — could be set up. Create frameworks and support for students to organise their own activities.
- 12) **Award academic credits** for activities within student associations, and more generally for practical work on enterprise projects outside the established courses, including the development of business plans.

Other relevant players and the business world

- 13) Business associations should encourage the **involvement** of their members in teaching entrepreneurship within educational establishments, as well as in taking an active role in organising business plan competitions and in providing support for getting the winning ideas off the ground. Industry should provide **sponsorship and funding** for start-ups created by students, within incubators or as a result of business plan competitions.

Coordination and support at European level

- 14) The Commission should support programmes for **training entrepreneurship teachers** within a European dimension, and should back the creation of **networks and cross-border exchange programmes** for educators. This would include encouraging the mobility of teachers across Europe for short periods of placement within institutions in different countries, and supporting the organisation of summer schools for a one-week exchange of experience among entrepreneurship professors and sharing of case studies and methods.
- 15) The Commission should conduct a regular and comprehensive **benchmarking of public policies in this area**. Member States should define an action plan, with results measured each year by way of reports that Member States would submit to the Commission.