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Evaluation of Programmes Concerning Education for Entrepreneurship

OECD Centre for Entrepreneurship, SMEs and Local Development (CFE)

FOREWORD

This report presents the output of work on the Evaluation of Entrepreneurship Education Programmes undertaken in 2007-2008 by the OECD Working Party on SMEs and Entrepreneurship (WPSMEE), with the support of the Spanish authorities.

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EVALUATION OF PROGRAMMES CONCERNING EDUCATION FOR ENTREPRENEURSHIP

EXECUTIVE SUMMARY

Although the importance of education for entrepreneurship, or enterprising behaviour, has been widely acknowledged, this has not necessarily been reflected in the systematic application of evaluation of education for entrepreneurship programmes.

The overall aim of the study, carried out by the OECD Working Party on SMEs and Entrepreneurship (WPSMEE), was "to strengthen the culture of evaluation within entrepreneurship education and to provide guidelines for evaluating in order to gain a better understanding of how to promote entrepreneurship education". The objectives accompanying this aim were:

- to emphasise the importance of the role of evaluation
- to strengthen the case for supporting education for entrepreneurship activity
- to enable those concerned with the quality and impact of provision to be better able to carry out evaluations
- to deepen the understanding of the impact of education for entrepreneurship programmes
- to align with the OECD Framework for the Evaluation of SME and Entrepreneurship Policies and Programmes
- to encourage the development of commonality and comparability in the evaluation of education for entrepreneurship programmes

The study comprised two phases:

Phase 1 focused on an overview of research methods by which education for entrepreneurship programmes might be evaluated, and involved an analytical literature review and the development of an evaluation matrix.

Phase 2 saw the production of practical tools and materials, notably a resource toolkit and a list of evaluation studies, along with a further developed evaluation matrix.

Education for entrepreneurship programmes

Education for entrepreneurship is concerned with the inculcation of a range of skills and attributes, including the ability to think creatively, to work in teams, to manage risk and handle uncertainty. This is underpinned by the recognition that changing 'mindsets' is fundamental. It can be described as being "part of the entrepreneurial pipeline which starts in education, runs through research to business".

As such, the effects or impact of the programme may not become apparent until well after the completion of participation in the programme, and therefore may require a longitudinal element in any evaluation of impact.

Education for entrepreneurship programmes can be delivered at different levels of the education system, as well as by private and voluntary organizations. Also, it is important to recognize that entrepreneurial skills and attitudes can be applied in: work organizations of all types; non-work settings, such as voluntary work or organizing clubs and societies; and domestic or social activities.

There is a multiplicity of activities which can be subsumed within the category of education for entrepreneurship. Broadly, the aims and objectives can be divided into the following categories, which are not mutually exclusive;

- The acquisition of key (or core) skills;
- The development of personal and social skills; and
- Skills relating to business start-up or financial literacy.

Clearly, the aims and objectives of programmes determine the outcomes which are sought, and which, in turn, provide indicators which an evaluation should seek to measure or assess. They can be delivered in a variety of forms within different countries, often ranging from programmes delivered nationally, to individual, one-off events delivered locally. A broad distinction can be made in the forms in which programmes are delivered between:

- Education-based programmes, wherein education for entrepreneurship may be taught as a distinct subject, may be integrated more widely into the curriculum, or may involve the setting up of mini-enterprises;
- Award schemes; and
- Partnership schemes

Education-based programmes are often targeted at young people in secondary school, or at university undergraduates. There are, however, some examples of programmes for pupils at primary school level, such as those run by Junior Achievement in the United States, and the New Zealand Primary Enterprise Programme (PrEP).

Courses and programmes associated with entrepreneurship, many of which contain a strong business focus, are delivered at university level. For example, the Berger Entrepreneurship Program at the University of Arizona, which was originally introduced in 1983, draws on staff to teach the programme from the departments of finance, economics, marketing, and management. The core courses of the curriculum include competitive advantage, venture finance, market research and business plans development.

The idea of education for entrepreneurship being embedded within the broader school curriculum has been recognised and adopted widely. For example, programmes which have entrepreneurship as a curriculum goal have been launched in New Zealand. This approach is often predicated on the need for a 'whole school' design to be adopted. In this case, education for entrepreneurship provides "an underlying basis for delivering education across all areas of the curriculum".

Programmes frequently have a 'hands-on' approach, where students set up and run 'mini-companies'. A report on the use of mini-companies in secondary education (European Commission, 2005) stated that "the objective of a student company is to develop either a real economic activity on a small scale or a realistic simulation of an economic activity".

An example of an award scheme is the ASDAN awards scheme in the UK, where students receive credits for completing challenges in a number of areas, including Science and Technology, Work Related Activities, and Information Transmission. In Australia, the *Plan Your Own Enterprise Competition* is designed to raise students' awareness of small business management and planning principles and practices. It is targeted at Year 11 students and consists of a business planning competition.

An example of a partnership scheme is Young Achievement Australia, which offers programmes which provide a link between education and industry. A Business Skills Programme, which is facilitated by mentors from the business world, is delivered outside school to groups of 15 to 25 young people for two hours a week over 16 to 24 weeks. They are required to "create, manufacture and market a product or service in a competitive environment", thereby going through the stages of a business cycle "and take responsibility for all essential business processes, from selling shares and raising capital to liquidating the company".

Evaluation

Although this study took account of, and was aligned with, the *OECD Framework for the Evaluation of SME and Entrepreneurship Policies and Programmes*, the nature of education for entrepreneurship programmes, with the emphasis on education, differentiates the focus of evaluation of these programmes from those of other SME related activities and processes.

Given that the aim of programmes is to generate a shift in attitudes towards entrepreneurship, it becomes difficult to ascribe quantifiable measures, so that, instead of 'hard' outcome evidence (such as the numbers initiating a business start-up), an attempt has to be made to gauge 'softer' outcomes (such as changes in attitude).

A key starting point is the belief that evaluation should be viewed as vital in order to ensure that optimum benefits are derived from a programme. It is important to understand that the lessons learned through the evaluation process, including why things did not work, and what were the unanticipated consequences or side effects, are as valuable as the identification of exemplary practices. It should also be acknowledged that different sets of participants will have different sets of goals and expectations from the programme.

There is no single approach to the evaluation of education for entrepreneurship programmes, and therefore no single model which can be applied in all situations. A combination of *qualitative and quantitative* approaches may be used. For example, quantitative measures of success, akin to traditional output-related performance indicators, may be used in conjunction with qualitative assessments of attitudinal or perception shifts.

Evaluation can have both backward and forward looking purposes. It can be designed to tell us what outputs and outcomes were generated by a project/programme (what is called *summative* evaluation). But

it can also explain how, why, and under what conditions a policy intervention worked, or failed to work (i.e. *formative* evaluation). Formative evaluations are important for determining the reasons for effective implementation and delivery of policies, programmes or projects. For example, the findings of a formative evaluation process can provide valuable feedback on issues such as the planning and design of courses, as well as aspects of the content and the teaching methods employed.

A number of methodologies may be considered when undertaking an evaluation of education for entrepreneurship programmes. These include:

- The *experimental* approach - where people are randomly assigned to either a 'treatment' group, composed of those participating in some form of education for entrepreneurship activity, or a 'control' group composed of individuals who do not participate in the activity;

- *Non-experimental methodology* – which often involves a before and after comparison of the same individuals; or a comparison of independent groups of people, one of whose members are exposed to a treatment, to a similar group not exposed to the treatment;

- *Matching* – which attempts to pair each individual in the treatment group to a member of the control group who has similar characteristics;

- *Propensity Score Matching (PSM)* – which makes it possible to match along a single measure (the propensity score), which summarises these differences;

- The *difference-in-difference* approach – which combines matching with before and after treatment comparison.

When considering methods to evaluate the long-term impact of these programmes, the difficulties of establishing causality should not be underestimated.

A principal requirement for evaluating an impact is establishing that a difference in one, or more, relevant outcomes is caused by a particular treatment. This may require the establishment of a counterfactual.

Impact and effectiveness of evaluation

Examples can be found of positive impacts emanating from education for entrepreneurship programmes. The evaluation of the Berger Entrepreneurship Program, delivered at the University of Arizona, found that participation in the programme had a positive impact in terms of: risk-taking and the formation of new ventures; increasing the likelihood of becoming self-employed; income; the growth of firms; promoting the transfer of technology from the university to the private sector; and, less strongly, job satisfaction.

Two studies conducted in Ireland, one of which had a considerable longitudinal element, also concluded that, over time, benefits can be derived from education for entrepreneurship programmes. However, the ability of education for entrepreneurship programmes to elicit positive outcomes will be highly dependent on the quality and appropriateness of the programme delivered.

Evaluation matrix

The evaluation matrix provides a guide for those intending to undertake evaluations of education for entrepreneurship activities. In particular, it indicates appropriate methodologies to adopt and affords reference to examples of evaluations.

The two main axes for the matrix comprise:

Types of programmes. This axis details the variety of programmes which can be subsumed under the three broad categories of*:*

- Learning entrepreneurial skills and attitudes
- Enhancing business start-up and entrepreneurial behaviour
- Development of business start-up and entrepreneurial skills

Evaluation requirements. Against each type of programme, the matrix identifies:

- *Key objectives* – the objectives of the programme
- *Evaluation questions* – the main issues which the evaluation is seeking to address
- *Required information* – the evidence which the evaluation will need to obtain to answer the questions
- *Evaluation methods* – the most appropriate methods to achieve the objectives of the evaluation.

List of references

The list of references is intended to provide examples of a variety of evaluations which have been conducted on education for entrepreneurship programmes, covering a range of programme types, evaluation methodologies and cultural contexts.

Each of the studies included in the list of references has an identification number which can be used to refer the reader to examples from evaluations which are most relevant. One of the features of this list is that it is capable of being updated, as and when new evaluations are identified. It should therefore be regarded as a continually evolving resource.

Resources toolkit

The resources toolkit provides analytical frameworks for evaluating education for entrepreneurship in different forms of education. It has the practical aim of assisting the decision-making of those seeking to evaluate education for entrepreneurship programmes, and in particular those who have little or no prior experience of conducting an evaluation. It seeks to generate a deeper understanding of the objectives of evaluation, as well as providing practical tools to enable the evaluation process to be carried out in an appropriate and rigorous manner. As such, the toolkit takes into account the requirement to provide templates and ideas which are appropriate for the different levels at which education for entrepreneurship programmes may be delivered: primary education; secondary education; post-secondary/vocational education; and higher education.

Crucially, in order to assist newcomers to evaluation or research methodology, references to examples of questionnaires and other research instruments from evaluations of education for entrepreneurship programmes are included in the Toolkit.

The sections which make up the toolkit are under the following headings:

- About evaluation
- Why evaluate?
- Purpose of the evaluation
- Types of evaluation
- Who should undertake the evaluation?
- Approach to evaluation
- Targeting and sampling
- Data collection
- Analysing data
- Reporting and interpreting findings

Conclusions and recommendations

Although there has been a dramatic increase in, and a growing emphasis on education for entrepreneurship programmes in recent years, there is a relative scarcity of robust evaluation data on which to make a compelling case for funding and supporting such programmes. This may partly be attributable to the variability in the objectives, content and delivery of education for entrepreneurship programmes, which militates against reliable data-gathering techniques. In particular, there is a lack of data which measures the outcomes and impact of programmes. Methodologically, the majority of these studies are limited, because, they may lack 'before and after' comparisons, there are frequently no control groups and very few have a longitudinal dimension.

There is clearly a need to generate a greater understanding of, and attachment to, the evaluation process, and the variety of methods which may be used. The following recommendations can be made:

- the inclusion of an evaluation strategy should be a pre-requisite of any submission for funding of an education for entrepreneurship programme;
- that evaluation strategy should be a key component of the design stage of any programme;
- when initiating any form of substantive evaluation of education for entrepreneurship programmes, it is essential, at the outset, to ensure that there is an agreed operational definition of education for entrepreneurship, and the outcomes/impact which the study is seeking to measure;
- the approach, format, degree of sophistication and timescale of the evaluation should be determined by the resources available and by the complexity and scope of the programme;
- where resources allow, externally provided experts in evaluation methodologies and techniques should be charged with conducting the evaluation;
- evaluation findings, even where they indicate a lack of impact, should inform future decision-making about the effectiveness, sustainability and format of programmes;
- effective and widespread dissemination of evaluation findings should be encouraged and supported, in order to enhance the development of a culture of evaluation.

I. INTRODUCTION

Recent years have seen increasing emphasis being placed, by governments across a range of countries, on stimulating greater commitment to enterprise and entrepreneurial activity, as part of broader economic goals. In addition to a pronounced growth of activity within schools to enhance students' awareness of enterprise opportunities, there has been an escalation of enterprise education and experience programmes. This was recognised at the second OECD Conference of Ministers responsible for Small and medium-sized enterprises (SMEs), where it was stated that:

> "Developing an entrepreneurial culture and fostering entrepreneurial attitudes and values has moved high on government agendas. Education and training (including lifelong training) in entrepreneurship and creativity are the preferred instruments for encouraging entrepreneurial behaviour in societies, and evidence suggests that such programmes can have an impact on entrepreneurial activity and enterprise performance" (OECD, 2004, p.10).

A key theme of the conference, which was held in Istanbul in June 2004 and was entitled "Promoting Entrepreneurship and Innovative SMEs in a Global Economy", was 'fostering entrepreneurship'. Within this theme, the importance of evaluating programmes was asserted:

> "Regular evaluation is essential to identify ways of improving those programmes that should be retained and to provide a basis for reallocating funds where they should not" (OECD, 2004, p.37).

Fundamental to this emphasis on the need for the evaluation of programmes was the recognition that there was a lack of authoritative evaluation studies of education for entrepreneurship programmes. Therefore, a recommendation of the conference was for the development of "an 'evaluation culture' by making evaluation of programmes central to the policy process".

Although the importance of education for entrepreneurship, or enterprising behaviour, has been widely acknowledged, this has not necessarily been reflected in the systematic application of evaluation of education for entrepreneurship programmes, which could provide evidence of the emergence of such a culture.

II. AIMS AND OBJECTIVES OF THE STUDY

In line with the recommendations of the Istanbul conference, the OECD Working Party on SMEs and Entrepreneurship (WPSMEE) developed a proposal for a Study on the Evaluation of Programmes Concerning Education for Entrepreneurship. The overall aim of the study was "to strengthen the culture of evaluation within entrepreneurship education and to provide guidelines for evaluating in order to gain a better understanding of how to promote entrepreneurship education". The fundamental premise of the project was that the diversity, and relative scarcity, of approaches to the evaluation of education for entrepreneurship, pointed to a need for encouraging greater attachment to the evaluation of programmes.

Crucially, it was also recognised that examples and suggestions of good practice can both enhance the robustness of individual evaluations, and generate a degree of comparability across programmes and national boundaries which has hitherto been lacking

The stated objectives of the study relating to issues and perceived gaps in relation to the evaluation of education for entrepreneurship activities were:

i. to emphasise the importance of the role of evaluation and thereby encourage its assimilation/integration more widely into the delivery of education for entrepreneurship programmes;

ii. to strengthen the case for supporting education for entrepreneurship activity, by identifying examples of evaluations which are able to provide evidence of the beneficial effects of participation;

iii. to enable those concerned with the quality and impact of provision to be better able to carry out evaluations;

iv. to deepen the understanding of the impact of education for entrepreneurship programmes and the needs of individuals, and to provide hard and persuasive evidence to support the case for investment in such programmes, by identifying and describing examples of 'good practice' in undertaking evaluations;

v. to build on and align with the OECD Framework for the Evaluation of SME and Entrepreneurship Policies and Programmes;

vi. to encourage the development of a degree of commonality and comparability in the evaluation of education for entrepreneurship programmes across different national contexts – with a view to establishing a robust and compelling body of evidence to support the funding to sustain such programmes.

III. DESIGN OF THE STUDY

The study comprised two phases. Phase 1 focused on an overview of research methods by which education for entrepreneurship programmes might be evaluated. The purpose of Phase 1 was to review analytically a wide range of relevant literature, with a particular focus on the methods adopted and approaches taken to the evaluation of programmes, especially where a measurement of the impact of such programmes has been sought. The key components of the phase were:

i. undertaking an analytical review of the literature, with a view to identifying and assessing the key issues and approaches on the evaluation of programmes concerning education for entrepreneurship; and

ii. developing a matrix, with axes for types of programmes and evaluation requirements, which provides a starting point for those considering conducting an evaluation.

The review focused on material which provides some evidence or description of:

- The stated aims and objectives of particular programmes;
- The methods adopted for delivering the programmes;
- The intended outcomes of such programmes;
- The development of methodological approaches and mechanisms for generating data relating to the effectiveness of programmes;
- The introduction in the programme design of monitoring or data-gathering instruments which offer the possibility of obtaining information relating to the measurement of impact;
- Examples of where evaluation of the impact of education for entrepreneurship programmes has been carried out and their results;
- Examples of good practice in terms of the structure, format and effectiveness of education for entrepreneurship programmes.

The overriding aim of Phase 2 was to produce a range of practical tools and materials which will enable the application of appropriate methods to be applied to the evaluation of education for entrepreneurship programmes. Accordingly, the key components of Phase 2 were:

i. the production of a resources toolkit which provides analytical frameworks for different forms of education for entrepreneurship programmes and suggested methodologies which might be used. It also sets out the advantages and disadvantages of different methods;

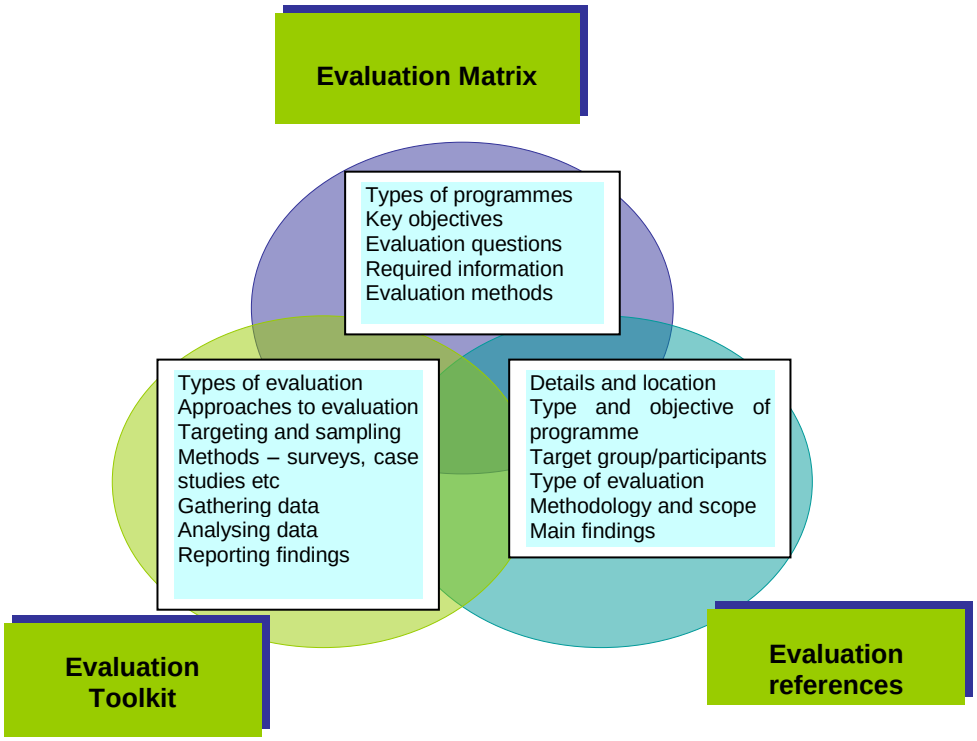
ii. a list of evaluation studies of education for entrepreneurship programmes which have been undertaken; and

iii. an evaluation matrix, whose structure was set out in the Phase I report.

These three components are designed to enable those intending to carry out evaluations to understand the range of potential approaches and mechanisms for conducting the evaluation and will be an invaluable resource. The following diagram illustrates how they are mutually supportive.

For those with relatively little experience or knowledge of evaluation, the matrix will be the starting point, as it provides an overview of the factors which need to be considered when designing an evaluation. Thereafter, the toolkit becomes the essential resource for determining which approaches to adopt and which research instruments may be most appropriate.

Figure 1. Education for Entrepreneurs: Key Components of Phase 2



IV. EDUCATION FOR ENTREPRENEURSHIP PROGRAMMES

Definition

Attempts to provide a precise definition of education for entrepreneurship tend to stress that it relates to the development of one or more of a combination of attitudes, personal qualities, and formal knowledge and skills. Certainly, the strength of opinion in the literature is that education for entrepreneurship is concerned with the inculcation of a range of skills and attributes, including the ability to think creatively, to work in teams, to manage risk and handle uncertainty. Lewis (2002) couches her definition of 'education for enterprise' in terms of an earlier OECD description of enterprise, by referring to it as relating to the development of "a group of qualities and competencies that enable individuals, organisations, communities to be flexible, creative and adaptable in the face of rapid social and economic change" (Lewis, 2002, p. 1).

However, underpinning this broad categorisation is the contention that changing 'mindsets' is fundamental. Thus, an overarching goal becomes that of fostering the development of a mindset which is conducive to entrepreneurship and to entrepreneurial behaviour.

> "Entrepreneurship education is important as a crucial determinant of the supply of entrepreneurship by forming (potential) entrepreneurs as well as contributing to a positive entrepreneurship culture. In this respect, entrepreneurship education should not only focus on narrow defined tools (e.g. how to start up a business, financial and human resources management) but also to broader attitudes (like creativity, risk taking, etc.) especially on the lower and secondary level" (OECD, 2008, p. 112)"

Thus, the notion of education for entrepreneurship as essentially about inculcating a positive 'mindset', or attitude to entrepreneurship is fundamental to this report. An apt description was provided by a discussant of an earlier draft of the report – "it is part of the entrepreneurial pipeline which starts in education, runs through research to business"[1]. Another quote from a European Commission report points up that, if changing mindsets is required, then, almost inevitably, this becomes a drawn out process rather than an immediate conversion.

> "Entrepreneurship is a dynamic and social process where individuals, alone or in collaboration, identify opportunities for innovation and act upon these by transforming ideas into practical and targeted activities, whether in a social, cultural or economic context" (European Commission, 2006, p 20)

This recognition of education for entrepreneurship programmes being part of a process which may take some time to reach fruition and may produce outcomes across a range of contexts, has fundamental implications for the evaluation of such programmes. Firstly, it needs to be acknowledged that the effects or impact of the programme may not become apparent until well after the completion of participation in the programme. This lends itself to the notion that longitudinal, or certainly longer-term evaluation studies are required.

Moreover, as it can be argued that the development of the appropriate mindset is a process which, over time, is dependent on a number of interventions, possibly of different types, it therefore becomes increasingly difficult to assess, or quantify the impact of a single intervention or programme on this process.

The point about the application of entrepreneurial skills and attitudes in different contexts is also important, as it broadens our perspective on what 'entrepreneurial' behaviour is about. It is not restricted to starting a business or running one's own enterprise. Individuals can act entrepreneurially within a wide range of roles in work organisations, large or small. Moreover, they can do so outside the working environment – in non-work activities, such as voluntary work or the organisation of sports clubs, and in the domestic and social spheres (see Iredale, 2002).

It is also necessary to be clear about the scope of education for entrepreneurship programmes. They can be delivered in a wide range of settings. At the geographical or administrative level, programmes may be available nationally, regionally, locally or at an institution level. The scope of this study will encompass provision from different levels of education, as well as that which is delivered by private sector or charitable organisations, or as part of national campaigns.

Aims and objectives of programmes

There is a multiplicity of activities which can be subsumed within the category of education for entrepreneurship. For example, some will seek to provide skills which are fundamental to supporting business start-up and self-employment, while others will seek to imbue individuals with the appropriate

[1] This quotation is taken from a valuable contribution by Sanne Tonneijck, former Dutch delegate to the WPSMEE.

mindsets/perspectives and confidence to operate in an entrepreneurial manner in the course of their work. While there may be similarities between the aims and the content of different programmes, it is important to recognise that these differences exist, and that an understanding of the aims and objectives is essential when undertaking an evaluation. Broadly, the aims and objectives can be divided into the following categories, which are not mutually exclusive;

- The acquisition of key (or core) skills: these may relate to literacy, numeracy, communications, ICT and problem solving. They represent the fundamental requirements for operating effectively in a working environment, and for career planning and the process of identifying and accessing appropriate work opportunities;

- The development of personal and social skills: a whole raft of skill areas or personal attributes may be subsumed within this category, including: team working; self-confidence; self-awareness; risk taking; problem solving; creativity; and the desire to innovate;

- Skills relating to business start-up or financial literacy, such as drafting business plans, marketing, financial management, sales, and human resource management. Participants often undertake an exercise in setting up and running their own company. In some programmes, the inclusion of a financial element enables participants to develop the ability to plan personal and family budgets.

Clearly, the aims and objectives of programmes determine the outcomes which are sought, and which, in turn, provide indicators which an evaluation should seek to measure or assess. For example, outcomes may include:

- Greater confidence to work independently or to operate in an organisational environment;
- Enhanced employability; or
- Increases in business start-up.

Box 1. Example of an Approach to Establishing Objectives

In the United Kingdom, the Qualifications and Curriculum Authority (QCA) provides guidance on the statutory requirement for work-related learning[1]. Emphasis is placed on three main components of employability: enterprise capability; financial literacy; and economic and business understanding. This approach is derived from the findings of the Davies Review[1], which defines these components, and the knowledge, skills and attitudes which they require as follows:

Enterprise capability: the capability to handle uncertainty and respond positively to change, to create and implement new ideas and new ways of doing things, to make reasonable risk / reward assessments and act upon them in one's personal and working life.

• Knowledge and understanding of concepts - organisation, innovation, risk, change;

• Skills - decision-making (particularly under conditions of uncertainty), personal and social, leadership, risk management, presentational;

• Attitudes - self-reliance, open-mindedness, respect for evidence, pragmatism, commitment to making a difference;

• Qualities - adaptability, perseverance, determination, flexibility, creativeness, improvisation, confidence, initiative, self-confidence, autonomy, action-orientation.

Financial literacy: the knowledge, skills and attitudes necessary to become a questioning and informed consumer of financial services and the ability to manage one's finances effectively.

• Knowledge and understanding - familiarity with a range of concepts such as money, credit and investment;

• Skills and competence - budgeting, financial planning and personal risk management;

• Attitudes - taking responsibility for the wider impact and implications of money and financial decisions on individuals, business and the community.

Economic and business understanding: a process of enquiry, focused on the context of business, central to which is the idea that resources are scarce so that choices have to be made between alternative uses.

• Knowledge and understanding - familiarity with a range of economic concepts such as the market, competition, price, efficiency and economic growth

• Skills - the ability to take decisions and make judgements on issues with an economic dimension, investigate simple hypotheses and apply theoretical understanding to practical situations

• Attitudes - an interest and concern in: economic affairs, responsible use of resources, challenges of business and its importance to society, responsibility of employers to the community and the environment

[1] QCA (2003) *Work-related learning for all at key stage 4: Guidance for implementing the statutory requirement from 2004*. Qualifications and Curriculum Authority.

[1] Davies, H. (2002) *A Review of Enterprise and the Economy in Education.* HM Treasury

Types of programmes

Education for entrepreneurship can be delivered in a variety of forms within different countries, often ranging from programmes delivered nationally, to individual, one-off events delivered locally. For example, in the United States, a number of education and enterprise programmes, such as Junior Achievement and NFTE, are nationally available, whilst others are delivered in one state (or area), such as the IN2BIZ Entrepreneur summer camp which is held in Oregon. An Australian example of a programme available nationally is Young Achievement Australia (YAA), whose programmes link education with business and aim to provide appropriate skills and knowledge to help young people in their working lives.

In addition to the various objectives of programmes identified earlier, the method of delivery and the scope of the programme (e.g. whether national or local) will have a bearing on the approach taken in any evaluation, as these will determine from whom data may be obtained (teachers, participants etc), the timescale over which data collection is possible or desirable, and the sample sizes which can be derived.

A broad distinction can be made in the forms in which programmes are delivered between:

- Education-based programmes wherein education for entrepreneurship may be taught as a distinct subject, may be integrated more widely into the curriculum, or may involve the setting up of mini-enterprises;
- Award schemes; and
- Partnership schemes

Education-based programmes

As indicated above, education-based programmes may have a variety of methods of delivery. However, in line with the aims and objectives of programmes outlined in the previous section, they range from what Australia's Ministerial Council on Education, Employment, Training and Youth Affairs (MCEETYA) *National Goals for Schooling in the Twenty-First Century* policy (1999)[2] termed:

- "narrow views of education about enterprise (i.e. a knowledge of the world of work and business), or education for enterprise (i.e. focusing on the knowledge and attitudes necessary for self-employment or small business commencement), to

- the broad view of enterprise as an approach to teaching and learning. The broad view focuses on teaching and learning that is student-driven and authentic (usually through ways that integrate the curriculum and are delivered in authentic contexts, often in partnerships with the community)"

Programmes delivered by Enterprise New Zealand have been designed to promote a culture of enterprise education at different school levels. At the primary level, the Primary Enterprise Programme (PrEP) enables students to begin "learning to live" by setting up their own businesses. A key element of the programme is the need to solve problems and they are encouraged to take risks and resolve any challenges which may arise. The Enterprise Studies Programme (ESP) targets young people in Year 10 and is "an innovative, action based programme targeting the economics, social studies and technology curriculum areas". An experiential approach, whereby students develop their own projects, is adopted. The emphasis is on self-discovery, team work and motivation. Thereafter, the Young Enterprise Scheme (YES) is "a learning experience for young people, teachers and business people in which senior secondary school students form a company; become directors; develop products and services, which they market and sell. YES is school based and teaches skills in budgeting, planning, interpersonal relations, decision making, reporting, communications; risk management and teamwork"[3].

Similarly, in Scotland, Determined to Succeed has been introduced across all school levels, with a view to developing an enterprise ethos and effectively changing the culture within schools. The four main strands of the programme are: enterprising teaching and learning; entrepreneurial learning; work-based vocational learning; and career education (Scottish Executive, 2007).

[2] The new 2009 MCEETYA National Goals do not make explicit mention of enterprise education.

[3] Enterprise New Zealand Trust website: www.enzt.co.nz

Although education-based programmes are often targeted at young people in secondary school, or at university undergraduates, there are examples of programmes for pupils at primary school level, such as those run by Junior Achievement in the United States, and the New Zealand Primary Enterprise Programme (PrEP).

Box 2. Examples of Education-based Programmes

Junior Achievement's elementary school programmes have six sequential themes, each with five hands-on activities, as well as an after-school and capstone experience, work to change students' lives by helping them understand business and economics:

Ourselves® uses stories read aloud by the volunteer, along with hands-on activities to demonstrate helping, working, earning, and saving.

Our Families® emphasizes the roles people play in the local economy and engages students with activities about needs, wants, jobs, tools and skills, and interdependence.

Our Community® explores the interdependent roles of workers in a community, the work they perform, and how communities work.

Our City® studies careers, the skills people need to work in specific careers, and how businesses contribute to a city.

JA More than Money™ teaches students about earning, spending, sharing, and saving money, and businesses they can start or jobs they can perform to earn money.

Our Region® introduces the relationship between the natural, human, and capital resources found in different regions and explores regional businesses that produce goods and services for consumers.

Our Nation® provides practical information about businesses' need for individuals who can meet the demands of the job market, including high-growth, high-demand jobs.

JA BizTown™ provides a simulated community where students assume the roles of workers and consumers.

American examples of programmes for students at both primary and high school level include programmes for young people in elementary school - Bizworld, and Kids and the Power of Work (KAPOW), whereas YoungBiz covers a wider age range, having programmes for young people aged 8 to 18 years.

The Dynamo Programme, which operates in Wales, aims to develop entrepreneurial attitudes and skills among primary and secondary school students, through setting up role model networks and providing curriculum materials.

Examples of programmes targeted at secondary school students include:

- 'Let's Make a Company' (Kaisha wo tsukrou), which is delivered in Japan and is an activity for Junior High School students. The programme, which was developed in 2003, was run in two schools in Mie Prefecture in 2003/04. It has a business focus, wherein students in teams of 5 to 10 set up and run a mini-company competing for the highest profits;

- The Young Entrepreneurs Scheme (YES) is a national programme running in Irish schools which is aimed at young people aged between 12 and 18. The scheme aims to stimulate enterprise and innovative activity by operating businesses in schools;

- In Germany, the "Go! To School" project, run by the Institute of German Economy, in Cologne, gives students an overview about entrepreneurship and encourages them to consider starting their own businesses;

- The Txingu Programme, in Spain, targets students undertaking vocational training, in order to enhance their understanding of business and promote an entrepreneurial culture;

- Junior Achievement Young Enterprise, which is delivered throughout Europe and many other countries, is targeted at 15-19 year old school students, to enable them to gain experience of how business works.

Courses and programmes associated with entrepreneurship, many of which contain a strong business focus, are delivered at university level. The following examples give a flavour of what is provided:

- The 'Dare to be Entrepreneurial' (Ousar Empreender) project, which was launched in Portugal for university students in 1999;

- The INNOVA programme at the Polytechnic University of Catalonia, in Spain, seeks to bring about cultural change relating to innovation, risk-taking and a commitment to enterprise;

- The Norwegian University of Science and Technology runs a series of courses on entrepreneurship and innovation, for both undergraduate and those studying doctorates;

- Also in Norway, Entreprenørskap og foretaksutvikling (Entrepreneurship and enterprise development) is a programme delivered at the University College of Østfold, with a remit to encourage business start-up;

- In Ireland, the four-year degree in Finance, Computing and Enterprise, based in Dublin, has a major component in Enterprise Development;

- For European Junior Enterprises, university students are offered the opportunity of running their own company, to provide practical experience which complements their academic studies;

- The University of Ljubljana, in Slovenia, runs a Masters programme in Entrepreneurship;

- A post-graduate university course in Bulgaria which focuses on business start-up;

- In the United States, the University of Wisconsin's Weinert Center for Entrepreneurship offers both undergraduate and postgraduate programmes on entrepreneurial management and enterprise development;

- In Austria, the UNIUN project (University Graduates and Students Develop Businesses) seeks to develop entrepreneurial attitudes and business start-up skills among university students.

The Berger Entrepreneurship Program at the University of Arizona was originally introduced in 1983, and draws on staff to teach the programme from the departments of finance, economics, marketing, and management. The core courses of the curriculum include competitive advantage, venture finance, market research and business plans development. In addition, courses in management information systems, management, finance, and marketing may be taken. Students work in pairs on a business plans competition, for which substantial cash prizes are awarded

The idea of education for entrepreneurship being embedded within the broader school curriculum has been recognised and adopted widely. For example, programmes which have entrepreneurship as a curriculum goal are being launched in New Zealand. There, the Regional Enterprise Clusters seek to embed an enterprise culture across the curriculum (Ref. 006). In Australia, the framework for vocational education in schools proposed in the 1999 *National Goals for Schooling in the Twenty-First Century* the Ministerial Council on Education, Employment, Training and Youth Affairs (MCEETYA) asserted that "Enterprise Education is a way of teaching and learning, *not* another addition to the curriculum or a subject or an alternative curriculum. It is about developing enterprising attitudes in students. The focus is *not* on discrete activities, but on providing an underlying basis for delivering education across all areas of the curriculum". It further advocated the adoption of a "whole school approach to the development of a culture of enterprise", with its inclusion in the strategic planning process.

This approach is similar to that in the United Kingdom, where the Teachernet website, in describing the role of education for entrepreneurship, contends that "the most effective schools take an inclusive approach: providing in-school training and awareness-raising for staff, who then devise different ways to enhance enterprise capability through changes to 'usual' lessons and teaching style, as well as through specific enterprise activity".

Mini-companies

Programmes frequently have a 'hands-on' approach where students set up and run 'mini-companies'. For example, the Europrise project, which emanated from the Leonardo Da Vinci programme in 1995 (European coverage), had the objective of increasing entrepreneurial competence in young people by combining group based learning with learning through observation and running a company.

Other examples include Young Entrepreneurship; a study programme for young people aged between 15 and 20 years old which is nationally available in Finland. In groups of 5 to 10, students manage and run an enterprise for a few hours a week over an academic year. The JUNIOR project in Germany (which is a member of 'Young Enterprise Europe') includes pupils in the 4th year of secondary school setting up mini-businesses.

A report on the use of mini-companies in secondary education (European Commission, 2005) stated that "the objective of a student company is to develop either a real economic activity on a small scale or a realistic simulation of an economic activity". The *Managing Firm* initiative in Poland was cited as an example of the latter, which tend to be run on computers, rather than through the establishment of 'real' products and services.

The Young Achievement Australia Business Skills Program is delivered over a 24 week period to groups of Year 9-11 and tertiary students. Within the programme, they "operate their own company, raise share capital; design, manufacture and sell a product or provide a service; and then wind up the company, paying a dividend to shareholders. Students work with mentors from the business community".

Similarly, in the UK, Young Enterprise offers a range of programmes, which are based on the principle of Learning by Doing. A key element of the programme is the introduction of volunteers from business into the classroom to work with teachers and students. Some programmes require students to work together to run their own company, while others make use of "games, hands on activities and role play to develop skills and capabilities for business and enterprise".

The IG Students programme, in Italy, enables secondary school students to gain practical experience of managing a company, thereby learning more about team working and the skills needed to become entrepreneurs.

The JUNIOR project in Germany (which is a member of 'Young Enterprise Europe') includes pupils in the 4th year of secondary school setting up mini-businesses.

Award schemes

An example of an award scheme is the ASDAN awards scheme in the UK, where students receive credits for completing challenges in a number of areas, including Science and Technology, Work Related Activities, and Information Transmission. Students must demonstrate evidence of action planning (including recording and reviewing achievements), as well as competence in the Wider Key Skills (opportunities are available to develop the other Key Skills).

For the Barclays New Futures Programme, schools and colleges develop and run programmes with a social goal (e.g. refugee after school support club, leisure sports clubs for special needs young people, etc.) to provide students with an opportunity to develop the skills necessary to plan, organise and set up a community enterprise. The scheme aims to encourage young people to act positively on issues affecting their local communities. Awards go to projects which enable students to learn new skills for life, work and citizenship through making a contribution to the community.

In Australia, the *Plan Your Own Enterprise Competition* is designed to raise students' awareness of small business management and planning principles and practices. It is targeted at Year 11 students and consists of a business planning competition.

Partnership schemes

Schemes promoting partnerships between schools and enterprises are commonly found. For instance, as part of the Junior Achievement programme in Hungary, 10,000 students in 50 schools were given the opportunity to meet and learn from entrepreneurs.

Another example is Young Entrepreneurship; a study programme for young people aged between 15 and 20 years old which is nationally available in Finland. In groups of 5 to 10, students manage and run an enterprise for a few hours a week over an academic year.

Young Achievement Australia offers programmes which provide a link between education and industry. A Business Skills Programme, which is facilitated by mentors from the business world, is delivered outside school to groups of 15 to 25 young people for two hours a week over 16 to 24 weeks. They are required to "create, manufacture and market a product or service in a competitive environment", thereby going through the stages of a business cycle "and take responsibility for all essential business processes, from selling shares and raising capital to liquidating the company". Additional support is provided through seminars and workshops, and annual awards are presented for regional, state and national winners.

A programme in four African countries (Benin, Togo, Burkina-Faso, and Cote d'Ivoire) which has reached more than 30,000 students since its launch in 1993 comprises the Junior and Senior Achievement programmes. The programme's aim was to develop an enterprising culture amongst young people, through partnerships between education and the private sector.

V. EVALUATION

Approaches to evaluation

In addressing the evaluation of education for entrepreneurship programmes, it was important that this study took account of, and was aligned with, the *OECD Framework for the Evaluation of SME and Entrepreneurship Policies and Programmes* (2007), which has as its four objectives:

- To increase the awareness of politicians and public officials of the benefits from having an evaluation culture;
- To disseminate examples of good micro evaluation practice at national and sub national levels;
- To highlight key evaluation debates: Who does evaluation? What procedures and methods should be used? When to do evaluation? What about the dissemination of findings? Should all policies be disseminated in the same way?
- To make a clear distinction between policies that operate at the micro level, i.e SME and entrepreneurship specific policies, and those that operate at the macro level, i.e. mainstream policies that nonetheless influence SMEs and entrepreneurship.

However, the nature of education for entrepreneurship programmes, with the emphasis on education, differentiates the focus of evaluation of these programmes from those of other SME related activities and processes. As already identified, the aim of many of these programmes, as well as informing participants about entrepreneurial activity and behaviour, is to generate a shift in attitudes towards entrepreneurship. This makes it more difficult to ascribe quantifiable measures, so that, instead of 'hard' outcome evidence (such as the numbers initiating a business start-up), an attempt has to be made to gauge 'softer' outcomes (such as changes in attitude). It may be argued that this level of complexity, and the difficulties of measuring this change, is one of the reasons for the relative scarcity of robust findings from rigorously applied evaluations of education for entrepreneurship programmes.

The limitations of evaluating any individual education for entrepreneurship programme are highlighted by Lewis (2002), who asserts that "all enterprise education programmes have different characteristics and are delivered in a variety of different contexts (cultural and educational)" (Lewis, 2002, p 21), thereby severely constraining any attempt to generalize on the basis of findings from a single study. Nonetheless, for this report, the WPSMEE sought to concentrate on the implementation of evaluation which seeks to address these complex issues, across a range of aims, objectives and delivery mechanisms of programmes, and to draw out issues which are specific to the evaluation of education for entrepreneurship programmes, rather than to the evaluation of SME and entrepreneurship programmes more generally.

A key starting point is the belief that evaluation should be viewed as vital in order to ensure that optimum benefits are derived from a programme. It is important to understand that the lessons learned through the evaluation process, including why things did not work, and what were the unanticipated consequences or side effects, are as valuable as the identification of exemplary practices. It should also be acknowledged that different sets of participants will have different sets of goals and expectations from the programme.

There is no single approach to the evaluation of education for entrepreneurship programmes, and therefore no single model which can be applied in all situations. It is more appropriate to think of evaluation in terms of a range of options or tools which can be selected and used according to the measure

or programme being assessed. This toolkit will comprise a combination of *qualitative and quantitative* options. For example, quantitative measures of success, akin to traditional output-related performance indicators, may be used in conjunction with qualitative assessments of attitudinal or perception shifts.

Evaluation can have both backward and forward looking purposes. It can be designed to tell us what outputs and outcomes were generated by a project/programme (what is called *summative* evaluation). But it can also explain how, why, and under what conditions a policy intervention worked, or failed to work (i.e. *formative* evaluation). Formative evaluations are important for determining the reasons for effective implementation and delivery of policies, programmes or projects. For example, the findings of a formative evaluation process can provide valuable feedback on issues such as the planning and design of courses, as well as aspects of the content and the teaching methods employed.

At the outset, evaluation should be considered as a means for assessing the extent to which the objectives of the initiative are being met efficiently, effectively and economically. The notion of 'value for money', which inevitably arises when new initiatives are being assessed, is commonly accompanied by consideration of the following effects:

- *substitution* – where one form of subsidised education for entrepreneurship programme is preferred to an unsubsidised one;

- *deadweight* – where programmes have simply compensated recipients for actions they would have taken even without such programme assistance;

- *displacement* – where participation in a programme has had the effect of forcing or displacing others from engaging in such activity;

- *leakage* – where a programme has an effect on those who are not participating (e.g. members of the control group).

Methodological options

A number of methodologies may be considered when undertaking an evaluation of education for entrepreneurship programmes. Firstly, there is the *experimental* approach to evaluation, where people are randomly assigned to either:

- a 'treatment' group, composed of those participating in some form of education for entrepreneurship activity, or

- a 'control' group composed of individuals who do not participate in the activity.

This enables an assessment of the effect of the activity to be made. However, experiments are difficult to carry out in practice, and assume a 'common effect' across the whole treatment or control group. Also, the effects may only apply within the particular setting (e.g. educational level, geographical area) of the programme being evaluated, so that it may not be possible to say what would happen when a programme is generalised in a different setting. It is therefore advisable to complement this approach with non-experimental methods.

Non-experimental methodology subsumes a wide range of techniques. A common theme is either a before and after comparison of the same individuals; or a comparison of independent groups of people, one whose members are exposed to a treatment, to a similar group not exposed to the treatment.

Matching attempts to pair each individual in the treatment group to a member of the control group who has similar characteristics (e.g. age, gender, socio-economic group, qualification attainment). Matches are selected on the basis of similarities in observed characteristics.

Propensity Score Matching (PSM), a derivation of matching, makes it possible to match along a single measure (the propensity score), which summarises these differences. Technically, the method has a number of difficulties, and depends on having a good understanding of the determinants of the outcome variables, a rich suite of variables measuring these determinants, and pre-intervention measures of these determinants.

The *difference-in-difference* approach combines matching with before and after treatment comparison. A treatment group and a control group are selected and data collected both before and after participation (or non-participation) in the education for entrepreneurship programme. A calculation is then made of the difference in the average outcome in the treatment group before and after treatment, minus the difference in the average outcome in the control group before and after treatment.

Overall, non-experimental methods can be powerful evaluation tools, particularly if the process underlying the outcome variables is well known, and data exist on the relevant measures. In such cases, matching offers a suitable method of evaluation. If it can be combined with a difference-in-difference approach, then certain unobserved measures can also be controlled for, which may improve the quality of the study.

When considering methods to evaluate the long-term impact of these programmes, the difficulties of establishing causality should not be underestimated. A key issue here is the time period over which data collection needs to take place before meaningful findings can be produced. This is particularly important, as it could be argued that longer-term outcomes, for the individual, the organisation, and society as a whole, are likely to reflect the true benefits of education for entrepreneurship. Thus, while changes in the propensity of programme participants to set up their own business could be apparent over the medium term, depending upon the age of the students, evidence of significant attitudinal shifts related to an attachment to entrepreneurship may take several years to emerge. It may be possible to detect attitudinal shifts from ongoing national household surveys, although attributing any change to a specific education for entrepreneurship programme would be extremely difficult.

Measuring impact

A principal requirement for evaluating an impact is establishing that a difference in one, or more, relevant outcomes is caused by a particular treatment. Typically, this is achieved by exposing members of one group to a treatment and preventing members of another group (the 'control' group) from receiving this treatment. The evaluation problem is to establish and quantify the impact of a treatment, and estimate what would have happened to the treatment group in the absence of the treatment. This has come to be known as the ‘counterfactual’.

Purdon(2002) lists four pertinent steps in defining the counterfactual:

i. decide what the impact of the treatment is to be compared against;

ii. identify what constitutes success for the programme in order to determine what outcomes will be measured;

iii. specify the target population;

iv. decide when to measure the impact.

In attempting to determine whether any of the numerous interventions that could be classified as education for entrepreneurship activity have been influential, it is first necessary to decide what counts as a treatment. It is then necessary to define and measure the counterfactual. This entails deciding upon the outcome measures; and having data on outcomes measured at relevant time points.

The use of *Propensity Score Matching* techniques would require a rich and relevant suite of pre-intervention data in order to undertake the matching. If selection modelling were to be used, this would require an instrument that enabled selection into the programme to be modelled, with the instrument being conditionally independent of the outcomes. Not only would the data be required for the treatment group, but, more crucially, corresponding data would also be required for the control group.

What is important is to have a clear idea of what is meant by a treatment; what are the outcomes, when are they likely to occur; how should the counterfactual be defined; which effect do we want to measure; and what is the target population of interest? Once these questions have been addressed, it becomes possible to consider an evaluation method.

VI. IMPACT AND EFFECTIVENESS OF EVALUATION

An important aspect of the whole Study on the Evaluation of Programmes Concerning Education for Entrepreneurship is the need to provide evidence of the benefits of education for entrepreneurship programmes, in order to elicit ongoing support and funding for these activities. One of the major difficulties for making claims about the impact of education for entrepreneurship programmes, especially when attitudinal shifts are concerned, is that of establishing causality. While shifts in attitude or behaviour may be identified, uncertainty surrounds the attribution of that change, or part of that change, to a single factor. This may be one of the reasons for the scarcity of robust evidence of the positive impact of education for entrepreneurship.

A recent study conducted in the Netherlands (Oosterbeek, van Praag and Ijsselstein, 2008. Ref. 004) sought to identify the impact of a mini-company programme, whose participants were vocational college students, on the entrepreneurial skills and competences of those students. In a methodologically rigorous piece of research, which involved a difference-in-difference approach, with a control group, the authors concluded that the overall effect of the programme on entrepreneurial skills was insignificant. Moreover, the impact on the students' intentions to become an entrepreneur was "significantly negative".

Nonetheless, examples can be found of positive impacts. A study which provides some of the most powerful evidence of the benefits to be derived from education for entrepreneurship programmes was that undertaken by Alberta Charney and Gary D Libecap (Charney and Libecap, 2000. Ref. 001) of the Berger Entrepreneurship Program, which had been running at the University of Arizona since 1983. The evaluation compared graduates of the programme between 1985 and 1998 with a matched sample of non-entrepreneurship business graduates from the same university). A response rate of 21 per cent yielded a sample of 105 programme participants and 406 non-participants. The findings suggested that participation in the programme had a positive impact in terms of: risk-taking and the formation of new ventures; increasing the likelihood of becoming self-employed; income; the growth of firms; promoting the transfer of technology from the university to the private sector; and, less strongly, job satisfaction. In addition, a survey of deans, department heads and development officers at the university pointed to there having been a beneficial impact on curriculum development.

A recent study by McHugh and O'Gorman (2006) was initiated on the premise that, while the rapid growth in the number of education for entrepreneurship programmes in recent years had led to a significant increase in evaluation activity, there still remained a dearth of evidence of impact. Accordingly, they set out to discover whether there were differences in the attitudes and performance of entrepreneurs who had undertaken some form of education for entrepreneurship programme, and those who had not. Their study, which was conducted in the South-East of Ireland, sought to identify differences between those who had been on a twelve month full-time education for entrepreneurship programme and those who had been on a part-time programme, or had not received any entrepreneurship education at all. The research found pronounced differences between these two groups, in terms of the number of problems they were required to address, and, importantly, in the manner in which they were handled. They concluded that the findings of the study did provide solid evidence of a positive link between participation in education for entrepreneurship programmes and subsequent behaviour. Crucially, however, they placed emphasis on the fact that the type of programme they had undertaken was also a key determinant of their ability to operate entrepreneurially.

An earlier study conducted in Ireland (Fleming, 1996; Fleming and Owusu-Ansah, 2001. Ref. 018) is also important, because of its longitudinal nature, and the recognition that evidence of a predilection to become an entrepreneur or to engage in entrepreneurial activity, as a result of participation in an education for entrepreneurship programme, may not become apparent for a number of years. The conclusions reached by Fleming, which are, importantly, founded on soundly based and rigorously executed research, point to the benefits which, over time, can be derived from education for entrepreneurship programmes.

> "From the evidence of this longitudinal study it appears that creating an awareness of the entrepreneurship process and developing and transferring knowledge about business formation during higher education can indeed stimulate graduate entrepreneurship" (Fleming, 1996, p 116).

It is important to be aware of the point made by Fleming concerning the significance of the type of education for entrepreneurship in determining outcomes. While the examples cited above provide compelling evidence of the positive impact which education for entrepreneurship programmes can have, a cautionary note must be sounded about the dangers of assuming that whatever is delivered under the rubric of education for entrepreneurship will have similar beneficial effects. Clearly, the ability of education for entrepreneurship programmes to elicit positive outcomes will be highly dependent on the quality and appropriateness of the programme delivered.

VII. EVALUATION MATRIX

The matrix was developed on the basis of the findings of Phase 1, and is an attempt to accommodate the range of objectives and delivery methods of education for entrepreneurship programmes, as well as the various approaches to evaluation and instruments for gathering and analysing data which are available. As such, it seeks to represent, in a simple form, the complexities involved. The matrix provides a guide for those intending to undertake evaluations of education for entrepreneurship activities. In particular, it indicates appropriate methodologies to adopt.

The two main axes for the matrix comprise:

Types of programmes

This axis indicates the programmes which can be subsumed under the three broad categories of:

- Learning entrepreneurial skills and attitudes
- Enhancing business start-up and entrepreneurial behaviour
- Development of business start-up and entrepreneurial skills

Evaluation requirements

Against each type of programme, the matrix identifies:

- *Key objectives* – the objectives of the programme
- *Evaluation questions* – the main issues which the evaluation is seeking to address
- *Required information* – the evidence which the evaluation will need to obtain to answer the questions
- *Evaluation methods* – the most appropriate methods to achieve the objectives of the evaluation.

The matrix structure is based on the discussion within the Phase 1 report about the different types of programme, their objectives, the issues which should be addressed in any evaluation and the most apt methods through which the evaluation should be conducted.

Table 1. Evaluation requirements

Overall purpose of programmes	Key objectives	Evaluation questions	Required information	Evaluation methods
LEARNING ENTREPRENEURIAL SKILLS AND ATTITUDES				
Programmes delivered at all levels of education – primary/secondary/further and higher Modules embedded in work related curriculum Education/industry partnerships Mentoring schemes Programmes delivered by external agencies Award schemes	Acquisition of key skills Development of entrepreneurial attitudes	What knowledge was learned by participants? What skills were developed? How useful will these skills be in future careers?	Participants' levels of satisfaction with the programme Quantitative data on acquisition of skills and knowledge covered by the programme Perceptions of usefulness	Surveys of course graduates Observations of course delivery Focus groups of participants Interviews with programme deliverers

Campaigns to promote entrepreneurship			of programmes	
	Development of personal, social skills	What has been the impact of the programme and the benefits derived by participants?	Participant perceptions of benefits derived	Surveys of course graduates Interviews/questionnaires with course tutors and participants
	Encouragement of entrepreneurial attitudes and behaviour – promoting an enterprise culture	To what extent has the programme affected attitudes to entrepreneurship or employment more generally?	Qualitative assessments of changes in attitudes	Interviews/questionnaires with course tutors and participants Surveys of course graduates Pre-test and post-test design Longitudinal studies
Mini-enterprises	To give students experience of the world of work To provide experience of taking responsibility and being accountable	How far has involvement in mini-enterprise initiatives impacted on students' perceptions of 'enterprise'?	Assessments of those running the programmes Participant perceptions of benefits derived	Surveys of schools Focus groups of participants
ENHANCING BUSINESS START-UP AND ENTREPRENEURIAL BEHAVIOUR				
Initiatives targeted at enhancing business start-up	Encouraging business start-up Provision of support and mentoring, and the development of business skills	To what extent has the programme led to business start-up? What are the characteristics associated with entrepreneurial behaviour? What factors	Tendency of participants to start up own businesses Participants' perceptions of usefulness of the programme Analysis of the	Analysis of output performance data – proportion of participants starting up own business Surveys of course graduates Longitudinal studies of course participants Matched comparisons

		help individuals make the transition to self-employment? What are the chances of business survival?	characteristics of 'successful' entrepreneurs	Case studies of business start-ups
DEVELOPMENT OF BUSINESS START-UP AND ENTREPRENEURIAL SKILLS				
Business awareness courses	Development of business start-up skills (e.g., finance, legal, sales & marketing) Providing knowledge of the technical process of setting up a business	How appropriate are the skills which are delivered? To what extent have they been applied by participants? What has been the impact of the programmes on the sustainability of start-up businesses?	Participants' perceptions of usefulness of the programme Application of knowledge and skills acquired to the work/business context Propensity of participants to start their own business	Surveys of course graduates Longitudinal studies of course participants Matched comparisons Case studies

VIII. LIST OF REFERENCES

The following list of references is intended to provide examples of a variety of evaluations which have been conducted on education for entrepreneurship programmes, covering a range of programme types, evaluation methodology and cultural contexts.[4]

Each of the studies included in the list of references has an identification number which can be used to refer the reader to examples from evaluations which are most relevant. One of the features of this list is that it is capable of being updated, as and when new evaluations are identified. It should therefore be regarded as a continually evolving resource.

[4] As well as the programmes identified during the course of the research, this list includes some detailed in the ENTREDU website.

Table 2. Evaluations references

Title of programme and reference	Description of programme	Evaluation	Methods	Main findings and recommendations	Comment
001 Berger Entrepreneurship Program University of Arizona, 1985-1999 Charney, A, and Libecap, G. D., (2000), *The Impact of Entrepreneurship Education: An Evaluation of the Berger Entrepreneurship Program at the University of Arizona, 1985-1999*	***Type*** Learning entrepreneurial skills and attitudes ***Target group*** University-based programme with a dedicated curriculum Undergraduates, MBA students and graduate students from the colleges of engineering, medicine, science, agriculture ***Objectives*** To provide business and entrepreneurial skills	***Type*** Summative evaluation to measure the effect of the programme on graduates ***Aims*** To evaluate "the effect of the programme on technology transfer from the university to the private sector, the effect of the program on private giving to the business college, and the pedagogical effect of the entrepreneurship curriculum on other disciplines in the college".	Matched samples of programme participants and non-entrepreneurship business graduates, controlling for socio-economic characteristics of the individuals involved so that the marginal effect of entrepreneurship education can be observed, holding individual factors constant. Interviews with samples of department heads and other college administrators, the college Dean development officer and other officials, as well as those involved in technology transfer.	Participation in the programme had a positive impact in terms of: risk-taking and the formation of new ventures; increasing the likelihood of becoming self-employed; income; the growth of firms; promoting the transfer of technology from the university to the private sector; and, less strongly, job satisfaction. In addition, the survey of deans, department heads and development officers at the university pointed to there having been a beneficial impact on curriculum development.	This is an excellent example of an evaluation which is founded on a methodology incorporating matched samples, to achieve a counterfactual, and extended over a number of cohorts. It is also one of the most powerful evaluations of education for entrepreneurship programmes, in establishing the programme's positive impact.
002 Evaluation of the Northland Enterprising Teachers (NET) initiative	***Type*** Professional development programme.	***Type*** Formative evaluation ***Aims*** To assess changes in pedagogy resulting	Mixed method approach with quantitative and qualitative aspects. Case studies and	NET was found to have been very successful in stimulating and supporting change at the school planning level in its first two	A good example of a formative evaluation which sought the perspectives of those responsible for delivering the

Title of programme and reference	Description of programme	Evaluation	Methods	Main findings and recommendations	Comment
New Zealand Bolstad, R. (2006), *Evaluation of the Northland Enterprising Teachers (NET) initiative.* New Zealand Council for Educational Research. http://www.nzcer.org.nz/pdfs/15059.pdf	***Target group*** Secondary teachers and school leaders ***Objectives*** To help secondary teachers and school leaders develop an "enterprising" approach to teaching and learning in their subjects, and across their school curriculum.	from the schools' involvement in NET and to which education for entrepreneurship had been integrated into school planning and infrastructure.	surveys within four NET schools; and Postal surveys sent to NET teachers/school leaders in the remaining 14 NET schools	years. The impact of education for entrepreneurship was variable, depending on the enthusiasm of the teachers, but had not become embedded in the whole curriculum or culture of the schools.	programme. The combination of methods (surveys, case studies etc.) to derive data from a range of respondents provides an example of how to select the appropriate method for different data sources. Appendix A of the report, which contains the questionnaire used for the survey of school principals, is a valuable resource.
003 Determined to Succeed. Scotland National Foundation for Educational Research (2006) *National Evaluation of Determined to succeed.* Scottish Executive	***Type*** Learning entrepreneurial skills and attitudes National strategy ***Target group*** Primary and Secondary school pupils ***Objectives*** To prepare young people for the world of work through enterprising and	***Type*** Qualitative ***Aims*** To gather and analyse the views of key stakeholders in order to assess the impact on the infrastructure of Enterprise in Education and the extent to which inter-agency working had been successful.	Strategic interviews with policy makers and key stakeholders Desk study to review planning and delivery across 32 local authorities. Interviews with 32 local authority co-ordinators. Case studies in schools	The local authorities had made great efforts to implement the strategy. Considerable awareness had been generated. Some progress had been made in embedding Enterprise in Education into the curriculum. All secondary schools had developed links with local colleges.	This is a thorough evaluation which provides a good example of how to conduct stakeholder interviews and school case studies. It also provides examples of questionnaires.

Title of programme and reference	Description of programme	Evaluation	Methods	Main findings and recommendations	Comment
	entrepreneurial learning, work-based vocational learning and career education.			Most teachers had received appropriate training.	
004 Junior Achievement Student Mini-Company Program. The Netherlands Oosterbeek, H., van Praag, M. and Ijsselstein, A. (2008) *The impact of entrepreneurship education on entrepreneurship competencies and intentions: An evaluation of the Junior Achievement Student Mini-Company Program.* Jena Economic Research Papers.	***Type*** Development of business start-up skills Setting up and operation of a mini-company ***Target group*** Vocational college students ***Objectives*** To teach students to put theory into practice and to understand what entrepreneurship is all about.	***Type*** Impact study ***Aims*** To assess the impact of the programme on students' entrepreneurial competencies and intentions	Difference-in-difference study, comparing students participating in the programme and a comparable group in a college without the programme. Instrumental variables approach Regression analysis	The programme was found not to have had the intended effects, and there was no significant difference between the two groups in the development of their entrepreneurial skills.	This study is extremely interesting for the analytical techniques employed in a rigorous evaluation. Also, importantly, it concludes that the programme had had no significant impact on participants.
005 Promoting a Business and Enterprise Culture Programme New Zealand	***Type*** Learning to become entrepreneurial, through: 1. Research into New	***Type*** Impact evaluation. ***Aims*** To examine the implementation,	Interviews with providers, participants and stakeholders. Desk research of documents and reports	The fund for enterprise activities was found to be having a positive effect, but the other components had not been successful. It	This is a good example of an evaluation which makes concrete recommendations about future policy direction.

Title of programme and reference	Description of programme	Evaluation	Methods	Main findings and recommendations	Comment
Evaluation of the Promoting a Business and Enterprise Culture Programme http://www.med.govt.nz/templates/MultipageDocumentPage____24523.aspx	Zealanders' attitudes and development of core values; 2. A communications campaign; 3. A fund for enterprise activities in schools and new businesses. ***Target group*** 1. General public 2. School and university students ***Objectives*** "to encourage a more supportive culture toward entrepreneurial activities within New Zealand, and enterprising skills and mindsets among current and potential entrepreneurs"	delivery and outcomes of the programme		was recommended that the communications campaign and the initiative as a whole should be discontinued	
006 Regional Enterprise Clusters New Zealand Roberts, J., Bolstad,	***Type*** Learning entrepreneurial skills and attitudes ***Target group*** Schools based	***Type*** Process evaluation ***Aims*** To "examine the processes by which the clusters establish and pursue education for	Mixed method quantitative/qualitative Tracking studies of students and teachers,	Ongoing 2007-2009 To date, a series of mini-reports have been produced. The 2009 report on the 2008 student survey states that there was "a generally positive	An extremely well-conducted evaluation which provides an example of how to conduct a tracking study

Title of programme and reference	Description of programme	Evaluation	Methods	Main findings and recommendations	Comment
R., McDowall, S., Cooper, G. and Gilbert J. (2007) *Evaluation of the regional education for enterprise (E4E) clusters (2007-2009).* New Zealand Council for Educational Research. www.med.govt.nz/templates/multipagedocumentpage___24523.aspx http://www.nzcer.org.nz/pdfs/16847.pdf	***Objectives*** Embedding an enterprise culture across the curriculum – enterprise skills, attributes and knowledge	entrepreneurship and the outcomes that are achieved (in relation to both local and national objectives)"		perspective on the experience of students"	
007 European Junior Enterprises Jesenovec, J. and Redien-Collot, R. (2005) *Research on the Entrepreneurial mind-set of Junior Entrepreneurs.* Jade (European Confederation of Junior Enterprises). www.jadenet.org/download/publications/entrep	***Type*** Development of business start-up skills ***Target group*** University students ***Objectives*** To provide practical experience of running a company to complement the theoretical knowledge derived from their studies	***Type*** Mixed method ***Aims*** To assess the "development of entrepreneurial spirit among JEs' members and its present and long-term effects on students and alumni."	Review of the literature Qualitative survey of JE members and alumni – personal and email Online quantitative survey of JE members, alumni and customers	High proportions of both current students and alumni had started, or planned to start their own companies. Women tended to start companies on their own and were over-represented among entrepreneurial leaders	This is particularly interesting for its use of an online survey. For cost considerations, speed of data-gathering and enabling respondents to form considered responses, online methods have great attraction, and may be utilised to a much greater extent in future.

Title of programme and reference	Description of programme	Evaluation	Methods	Main findings and recommendations	Comment
reneurial_spirit/2005/2005_JADE_Research_Entrepreneurial_Spirit_Executive_Summary.pdf					
008 The Make Your Mark Campaign United Kingdom GfK NOP (2007) *Enterprise Campaign Research Tracker 2006.* Report of Key findings prepared for: The Make Your Mark Campaign. May.	***Type*** Learning entrepreneurial skills and attitudes National campaign ***Target group*** Young people ***Objectives*** To "inspire young people to be enterprising in the broadest sense – through business start-ups, social and community activism and as enterprising employee"	***Type*** Impact evaluation – tracking study ***Aims*** To track changes over time in young people's attitudes towards enterprise	On-line survey of young people	The results showed that the idea of "running your own business" was still popular amongst most respondents, and that enterprise had "entered the mainstream market for young people" Those who had participated in an enterprise event in the previous 12 months were more confident about starting a business. The engagement of women was identified as an area for attention	This highlights the benefits of an online survey method in generating responses from large samples.
009 Whole School Approach to Enterprise in Education. Scotland	***Type*** Learning entrepreneurial skills and attitudes. ***Target group***	***Type*** Impact evaluation ***Aims*** "To determine the impact of the	Survey of headteachers and other teachers, using a questionnaire On-line survey of	There was an increase in "total enterprise" at the primary level. The programme had "increased awareness of the Determined to	Given the increasing attachment to the notion of the whole school approach, this study, with its use of a combination of

Title of programme and reference	Description of programme	Evaluation	Methods	Main findings and recommendations	Comment
Wiggins, A., Cowie, M. and Tymms, P. (2007) *Evaluation of the Whole School Approach to Enterprise in Education: May 2004 – January 2006.* Scottish Executive Social Research.	Primary and secondary schools ***Objectives*** Promoting and developing enterprise in education in schools.	programme between January 2004 and March 2006 and to consider how it might be more widely applied."	participating students and control group Focus groups with teachers Interviews , both face-to-face and by telephone with headteachers and stakeholders Observation in classroom School visits Attendance at events	Succeed strategy and Enterprise in Education in both secondary and primary schools, and helped raise the Enterprise in Education skills of some of the teachers".	methods, illustrates the way such activities may be evaluated.
010 Determined to Succeed Scotland York Consulting Limited (2007) *National Evaluation of Determined to Succeed – Phase 2: Early Impact Across Scotland.* Scottish Executive Social Research.	***Type*** Learning entrepreneurial skills and attitudes ***Target group*** All pupils in full-time education in Scotland ***Objectives*** To prepare young people for the world of work and encourage ambition, through entrepreneurship, and to prepare them for life.	***Type*** Impact evaluation ***Aims*** To measure "the effectiveness and success of Determined to Succeed, to inform policy, delivery and future commitment to the strategy". This was done by: - assessing changes in views, attitudes and perceptions of young	Mixed method – mainly quantitative, comprising: - desk research - consultations with local authority representatives - quantitative surveys of teachers, parents and pupils - telephone interviews with headteachers	The policy had not, at that time, had a direct impact on "pupil skills, attitudes and behaviours". Schools were very positive about the initiative. The Index of Enterprising Attitudes and Behaviour (IOEAB) was positive for parents, pupils and teachers.	The timing of this evaluation, in order to assess early impact, indicates how evaluations can be built up over time to show a developing pattern of responses.

Title of programme and reference	Description of programme	Evaluation	Methods	Main findings and recommendations	Comment
		people - identifying changes in behaviour - assessing implementation and its impact on the effectiveness of the policy	- case studies of schools		
011 Xlerate Scotland Wiggins, A., Jones, K. and Tymms, P. (2006), *National Evaluation of Xlerate with XL: January 2005 – January 2006.* Scottish Executive Social Research.	***Type*** Learning entrepreneurial skills and attitudes ***Target group*** School pupils at S3 or S4 stage (aged 15 or 16) who are not achieving their full potential. ***Objectives*** To promote personal development, citizenship and enterprise in schools. The programme aims to increase pupils' knowledge of enterprises and enterprising behaviour.	***Type*** Summative evaluation ***Aims*** To make an assessment of the whole programme focussing on process and outcomes	Mixed method qualitative and quantitative evaluation, involving: - Visits to meet students and advisers - Focus groups with the co-ordinators and advisers - Telephone interviews with headteachers - Meetings and ongoing contact with key people - On-line surveys of students	The evaluation considered that Xlerate was "an excellent and very effective programme", which had had a very positive impact on the young people, helping them to become more enterprising.	Although this study has quantitative elements, it is the qualitative material which is of most interest.

Title of programme and reference	Description of programme	Evaluation	Methods	Main findings and recommendations	Comment
012 Regional Education for Enterprise Clusters New Zealand Roberts, J., McDowall, S. and Cooper, G. (2008) *Enterprising and future focused? The first report from the Regional Education for Enterprise Clusters Evaluation*. Report prepared for Ministry of Education and New Zealand Trade and Enterprise	***Type*** Learning entrepreneurial skills and attitudes ***Target group*** Secondary schools pupils ***Objectives*** To develop young people's competencies in innovation and managing and setting up businesses	***Type*** Mixture of formative, process and impact evaluation ***Aims*** To inform the development of the Education for Enterprise programme through an examination of the processes which are in place to implement the programme, and an assessment of the clusters' impact in creating sustainable education for enterprise	Mixed method design with qualitative and quantitative elements, including: Consultations with programme co-ordinators Surveys of school principals and students Focus groups of students Case studies of schools Surveys of community/business partners	The Education for Enterprise (E4E) programme was perceived to offer considerable potential as a vehicle for "21st century learning".	As well as being a commendable study in its own right, this report is extremely valuable for the descriptions of the various methods employed and for the examples of questionnaires and other research instruments in the appendix.
013 Junior Achievement (JA) Titan Programme Worldwide Lodestar (2007) *Junior Achievement Titan Program: 2007 Program Evaluation*. Lodestar Management/Research	***Type*** Development of business start-up skills ***Target group*** High school students ***Objectives*** "To help students develop the knowledge, skills and attitudes to become productive citizens and	***Type*** Summative ***Aims*** "To assess the extent to which the program attained desired outcomes in student knowledge, attitudes, behaviours and skills. To obtain the reactions of diverse stakeholders	Quantitative and Qualitative Review of background documents and literature Pre and post-student assessment Training session for member site staff Telephone interviews	"Overall program satisfaction is high among teachers, volunteers, JA member site staff, and students. Benefits are particularly high in the areas of core workforce readiness skills, communication and teamwork. Computer-based	Methodologically, this is a relatively unsophisticated study which nonetheless points to considerable positive impacts emanating from the programme.

Title of programme and reference	Description of programme	Evaluation	Methods	Main findings and recommendations	Comment
Inc.	workers.”	about the implementation and quality of the various program elements. To identify specific strategies and practices for program improvement.”	with staff Online survey with teachers, volunteers, and staff Focus groups with teachers, volunteers	simulation is an ideal learning tool The program is effective in facilitating the understanding of business and economics concepts and increasing student engagement The program has had a positive impact on student attitudes towards business”.	
014 Junior Achievement Young Enterprise (JA-YE). The Company Programme Europe "Enterprise in Education – Evaluation JA-YE Company Programme" (Document from Junior Achievement Young Enterprise (JA-YE) Norway, Ungt Entreprenørskap).	***Type*** Learning entrepreneurial skills and attitudes ***Target group*** 15-19 year old school students ***Objectives*** To promote entrepreneurship and entrepreneurial behaviour among young people. To enable young people to experience	***Type*** Summative ***Aims*** To assess the cumulative effects and long-term impact of students’ participation in JA programs	The findings from a series of evaluations conducted across different countries	Young people who participated in the programme were significantly more likely to become entrepreneurs than those who did not participate	This report provides a synthesis of the findings from a series of evaluations. It offers a good example of how these can be brought together to provide succinct and persuasive dissemination of results.

Title of programme and reference	Description of programme	Evaluation	Methods	Main findings and recommendations	Comment
	how business works and to establish education/industry links				
015 Enterprise learning at Key Stage 4 United Kingdom Ofsted (2004) *Learning to be enterprising: An evaluation of enterprise learning at Key Stage 4.* Office for Standards in Education. HMI 2148. August	***Type*** Learning entrepreneurial skills and attitudes ***Target group*** Secondary school pupils aged 14-16 ***Objectives*** Developing entrepreneurial attitudes and skills through pathfinder projects incorporating a variety of approaches, including curriculum based study, enterprise days, involvement in work related learning etc provided by organisations offering enterprise programmes	***Type*** Formative evaluation ***Aims*** To identify and recommend good practice in the implementation of enterprise education	Mixed method approach involving: - visits to schools - surveys of schools - observation of enterprise classes - interviews with headteachers and providers of enterprise programmes	Positive aspects were: - examples of pupils being motivated by enterprise learning and developing relevant skills - importance of commitment from senior managers - importance of clearly defined aims and objectives, pupils taking responsibility and being able to operate autonomously Problems identified included: - lack of a clear definition of enterprise learning - inadequate assessment of pupils' enterprise learning, - inadequate monitoring and evaluation of the implementation of enterprise learning - little evidence of	This is an example of a thorough study of data generated through the inspection process, and indicates how this can contribute to the improvement of programme delivery.

Title of programme and reference	Description of programme	Evaluation	Methods	Main findings and recommendations	Comment
				work-related learning being part of a coherent curriculum	
016 Enterprise Education in Schools Australia Keys Young (1999) *Evaluation of the Enterprise Education in Schools (EES) Element of the School to Work Programme: Final Report.* Department of Education, Training and Youth Affairs, Australia.	***Type*** Learning entrepreneurial skills and attitudes ***Target group*** Primary and secondary school students ***Objectives*** "To achieve a learning culture which will result in greater numbers of students equipped and enthused to identify, create, initiate and successfully manage personal, business, work and community opportunities"	***Type*** Mixed method – combination of qualitative and quantitative ***Aims*** – to assess the effectiveness of the projects funded in achieving its three key goals; – to identify barriers to the take-up of EES activities by primary and secondary schools; – to assess the level of awareness and appreciation of the value of being enterprising by school students, their teachers and parents, school principals and careers advisors, local businesses and community based	The following methods were used: – a national telephone survey of 647 school principals; – in-depth interviews with 60 schools, including 40 that had participated in EES funded projects; – face-to-face interviews with school principals and teachers, students, parents, business/ industry and community representatives; – in-depth interviews with 20 key informants; – consultations with project managers of key EES funded initiatives, and where appropriate, their evaluators.	Participating schools' knowledge of business and enterprise had increased. Students attained a sense of achievement, gained a greater knowledge of their own strengths and weaknesses, improved their ability to work cooperatively, increased their willingness to take the initiative and exercise responsibility, and in some cases improved their performance. There was considerable support for enterprise education in schools The 'hands on' experience of involvement in enterprising activities clearly had the greatest	An excellent example of a mixed method approach, which gathers data from a range of sources.

Title of programme and reference	Description of programme	Evaluation	Methods	Main findings and recommendations	Comment
		organisations; – to suggest strategies for effectively promoting and supporting enterprise education in Australian schools.		impact on individual principals, teachers, and students who participated.	
017 Dynamo Programme Wales Arad Consulting (2007) *Evaluation of Entrepreneurship Action Plan Culture Projects: Evaluation of the Dynamo Programme.* Final Report to the Welsh Assembly Government. October.	***Type*** Learning entrepreneurial skills and attitudes ***Target group*** Primary and secondary school students ***Objectives*** Developing entrepreneurial attitudes and skills through Role Model Networks and Curriculum Materials	***Type*** Summative evaluation ***Aims*** To assess: - awareness of, and demand for and use of the programme - value of the programme to schools and colleges - impact on target audiences - scale and selection of target audiences - integration with the curriculum - effectiveness of delivery models - quality of training for teachers and	Qualitative methods, comprising: Review of literature and documentation Case studies of 11 Secondary schools, 2 Primary schools and 2 colleges of further education Interviews and group discussions with key stakeholders	The programme fitted strategically with policy direction at European and Welsh levels Training of Role Models was adequate The programme was well promoted in schools across Wales Management of the programme was consistent across Wales The approaches adopted by Role Models were more appropriate for younger age groups Curriculum materials were of high quality and user-friendly Dissemination of information within	This is an objective study which exemplifies the positive role which independent evaluators can play in enhancing the quality of provision.

Title of programme and reference	Description of programme	Evaluation	Methods	Main findings and recommendations	Comment
		Role Models - strategic fit with national policy areas - value for money analysis		schools was haphazard Use of Dynamo materials was limited in Primary schools Retention of Role Models was high The impact of the programme, and the penetration across schools were below anticipated levels The level of in-school support required was intense More work is required to support the dissemination and promotion of information within schools.	
018 Entrepreneurship Education in Ireland Fleming, P. (1996) 'Entrepreneurship Education in Ireland: A Longitudinal Study' in *Academy of Entrepreneurship Journal, European*	***Type*** Learning entrepreneurial skills and attitudes ***Target group*** Higher Education students ***Objectives***	***Type*** Impact study ***Aims*** "To evaluate the ways in which graduates' attitudes and behaviours relate over time to new venture creation following	Longitudinal Initial 1991 postal survey of 838 graduates – 419 in the treatment group and 419 in the control group Follow-up 1996 survey tracking the members	The enterprise initiative had an effect on the cohort's subsequent career aspirations. "As graduates mature, the proportion entering business ownership increases". Half of those in	The overall scarcity of longitudinal studies of education for entrepreneurship programmes serves to underline the importance of this study. Not only is it commendable for the rigour of the methodology, but the

Title of programme and reference	Description of programme	Evaluation	Methods	Main findings and recommendations	Comment
Edition, vol.2, 1: 94 – 118. Fleming, P. and Owusu-Ansah, W. (2001) *The Impact of Entrepreneurship Education on Business Venturing: A Longitudinal Survey of Irish graduates*. Paper presented at the Internationalising Entrepreneurship Education and Training Conference.	To promote an awareness of self-employment as a career option and motivate young people to begin equipping themselves with the skills, knowledge and experience required for effective business ownership.	exposure to entrepreneurship concepts and practical assignments while at college/university."	of the treatment group conducted	employment indicated an interest in or expectation of setting up their own business at some time in the future.	ongoing series of sweeps of respondents means that its importance will continue to grow.
019 Local development Agents Sanchís, J R and Cantarero, S (2001) *Factores de éxito en la gestión de proyectos en el marco del desarrollo local (Success factors in the management of programmes in the frame of local development)*	***Type*** Learning to become an entrepreneur ***Target group*** Those in adult and further education ***Objectives*** To provide support in setting up a business	***Type*** Formative evaluation ***Aims*** To analyse the way in which local agents manage the programmes	Quantitative A survey of local development agents – achieved sample of 216	Providing support in the design and planning of the project were the most important aspects	This is a good example of a study targeted at programme providers which can be achieved within a limited budget.
020	***Type***	***Type***	Postal survey of	The scheme was found	In conjunction with the

Title of programme and reference	Description of programme	Evaluation	Methods	Main findings and recommendations	Comment
IDA Student Enterprise Award Scheme Ireland Fleming, P. (1994) The Role of Structured Interventions in Shaping Graduate Entrepreneurship*. Irish Business and Administrative Research*, Vol. 15, No. 8, p.146.	Learning entrepreneurial skills and attitudes ***Target group*** Higher education and adult education students ***Objectives*** To teach students about entrepreneurship	Impact assessment ***Aims*** To assess the impact, effectiveness and usefulness of education for entrepreneurship programmes in enabling or encouraging graduates start their own businesses	students and a control group	to have a positive effect in stimulating the level of graduate entrepreneurship	study described in Ref. 018, this report provides valuable evidence of the impact of programmes.
021 Enterprise education in three faculties at the Johannes Kepler University Linz. Austria Richter, J. (2001) StudentInnen und Unternehmensgründung. Eine empirische Studie an der Johannes Kepler Universität Linz (University Students and Start-ups. An empirical study at the Johannes Kepler University Linz.	***Type*** Learning entrepreneurial skills and attitudes ***Target group*** University students ***Objectives*** To develop an awareness of entrepreneurship	***Type*** Impact assessment ***Aims*** To assess the start-up propensity of the Johannes Kepler University's students, and the barriers they perceived	Quantitative Survey of a quota sample of 469 students	Students from the Economics faculty were more likely than those from other faculties to start up their own business The most important barriers to start-up were perceived to be: lack of equity capital, administrative barriers, high financial risk, lack of debt capital, and lack of a start-up idea.	This is an example of a quantitative survey which can achieve interesting results within a limited budget.

Title of programme and reference	Description of programme	Evaluation	Methods	Main findings and recommendations	Comment
022 UNIUN project (UNIUN - University Graduates and Students Develop Businesses) Austria Frank, H., Korunka, C. and Lueger, M. (2002), Entrepreneurial Spirit. Unternehmerische Orientierung und Gründungsneigung von Studierenden. (Entrepreneurial Spirit. Entrepreneurial Orientation and Start-Up Propensity of Higher Education Students). Department of Small Business Management, Vienna University of Economics and Business Administration.	***Type*** Learning entrepreneurial skills and attitudes ***Target group*** University students ***Objectives*** To develop entrepreneurial attitudes and business start-up skills	***Type*** Impact assessment ***Aims*** To assess the emergence of entrepreneurial attitudes and the likelihood of business start-up	Quantitative Questionnaires were completed by 837 students across 9 universities	The majority of students were not considering starting a business on graduation. Those from business faculties showed the greatest likelihood	This is a good example of quantitative survey techniques.
023 Begabungsförderungs modell Schumpeter-	***Type*** Learning entrepreneurial skills	***Type*** Formative	Multi-method approach incorporating qualitative and quantitative elements	There was a high level of satisfaction among students and their	This study provides a good example of how empirical research can be informed and

Title of programme and reference	Description of programme	Evaluation	Methods	Main findings and recommendations	Comment
Handelsakademie (Pilot project of an educational model for the promotion of gifted students called 'Schumpeter-Handelsakademie') Austria Aff, J., Magyar, T. and Probst, H. (2001) Wissenschaftliche Begleitforschung des Begabungsförderungs modells Schumpeter-Handelsakademie (Accompanying Scientific Research of the Pilot Project for the Promotion of Gifted 'Schumpeter-Classes').	and attitudes ***Target group*** Secondary school students ***Objectives*** To combine comprehensive enterprise education with an educational model for the promotion of gifted students	***Aims*** To assess the appropriateness of the curriculum and the teaching and learning methods used	Interviews Surveys Observations Document analysis Data derived from participants, teachers, funders, parents and a control group of participants	parents. The coaching element of the programme was rated especially highly	supplemented by desk research.
024 Junior classes and 'ordinary classes' at different types of advanced-level secondary schools Austria Frank, H., Korunka, C.	***Type*** Learning entrepreneurial skills and attitudes ***Target group*** Secondary school students ***Objectives***	***Type*** Impact assessment ***Aims*** To determine: 1. The extent to which different types of advanced-level secondary schools in Austria contribute to	Combination of qualitative and quantitative Workshops with teachers Survey of students – achieved sample of 890	Male students expressed a greater likelihood of starting a business The school's attitudes towards entrepreneurialism and active learning methods were key factors in students'	This is an interesting study which combines qualitative and quantitative research methods.

Title of programme and reference	Description of programme	Evaluation	Methods	Main findings and recommendations	Comment
and Lueger, M (2002) Unternehmerorientierung und Gründungsneigung. Eine Bestandsaufnahme bei SchülerInnen Allgemeinbildender und Berufsbildender Höherer Schulen in Österreich. (Entrepreneurial Orientation and Start-up Propensity. A Survey at Advanced-Level Secondary Vocational Schools and at Academic Secondary Schools).	To develop entrepreneurial attitudes through a variety of initiatives, such as mini-companies	promote their students' entrepreneurial attitudes 2. The extent to which the teaching of start-up related and entrepreneurial knowledge promote the development of positive attitudes towards entrepreneurship and venture creation as a future career option by students		likelihood of starting a business	
025 Entrepreneurship studies in 14 different polytechnics Finland Mansio, H. (1997) Opetuksen vaikuttavuus yrittäjäksi ryhtymiseen ammattikorkeakouluissa (The effectiveness of education in terms of entrepreneurial activity	***Type*** Learning entrepreneurial skills and attitudes ***Target group*** Polytechnic students ***Objectives*** To develop entrepreneurial skills	***Type*** Impact assessment ***Aims*** To assess the extent to which teaching entrepreneurship in polytechnics encourages students to become entrepreneurs	Mixed method Quantitative – survey of students – achieved sample of 739 Qualitative – analysis of study guides	Students have high regard for the theory-based programmes but feel that more education for entrepreneurship should be provided. However, the courses were not felt to encourage students to become entrepreneurs	This is an interesting study which assesses the impact of the programme on participants' attitudes.

Title of programme and reference	Description of programme	Evaluation	Methods	Main findings and recommendations	Comment
in polytechnics). Helsinki School of Economics and Business Administration					
026 Ten entrepreneurship programmes in Southwest Finland Finland Puhakka, V (1999) Yrittäjyyskoulutusohjelmien monitahoarviointi II. Tarkastelussa kymmenen varsinaissuomalaista koulutusohjelmaa. (Evaluation of Entrepreneurship Education II: the programmes of Southwest Finland under examination).	***Type*** Learning entrepreneurial skills and attitudes ***Target group*** Adults ***Objectives*** To develop entrepreneurial skills	***Type*** Formative ***Aims*** To evaluate ten entrepreneurship programmes	Surveys of stakeholders and programme participants	There was found to be a wide variation in the quality of provision	This study exemplifies the ability of evaluation to draw comparisons between different programmes.
027 Young Enterprise Scheme (YES) New Zealand Lewis, K. (2002) *An Enterprising Future:*	***Type*** Learning entrepreneurial skills and attitudes ***Target group*** Secondary school	***Type*** A 'responsive' evaluation ***Aims*** To determine the 'concerns and issues	Mixed method – quantitative and qualitative Literature review Observation of student activities	YES provided students with skills and strategies which would benefit them in the short and long term." Students felt that	This is an excellent example of a well-researched evaluation which is presented in a succinct and thoughtful manner. The findings are placed

Title of programme and reference	Description of programme	Evaluation	Methods	Main findings and recommendations	Comment
Evaluating the Young Enterprise Scheme. Enterprise New Zealand Trust. http://sme-centre.massey.ac.nz/files/Complete_final_ENZT_report.pdf	students ***Objectives*** To give students the opportunity to run their own company within the school environment	of stakeholding audiences'	Group interviews with students Survey of schools, with questionnaires for teachers and students	teachers were delivering the YES with a narrow focus on profit making and winning. Mentors were more effective when they had empathy with the students Being innovative and having commitment were the key elements for 'being enterprising' The opportunity to interact with new people in the context of a team was the primary positive impact of the YES on the participants Programmes need to be predominantly learner driven YES made students more employable by giving them a taste of the benefits of hard work and a degree of risk-taking	in a wider context through a discussion of the broader aims of education for entrepreneurship programmes. The report acknowledges the limitations of the study, notably the difficulties of generalising on the basis of the findings, and the timeframe (one year) which prevents longer-term impact being assessed.

IX. RESOURCES TOOLKIT

The resources toolkit has been designed in order to provide analytical frameworks for evaluating education for entrepreneurship in different forms of education. It has the practical aim of assisting the decision-making of those seeking to evaluate education for entrepreneurship programmes, and in particular those who have little or no prior experience of conducting an evaluation. It seeks to generate a deeper understanding of the objectives of evaluation, together with practical tools to enable the evaluation process to be carried out in an appropriate and rigorous manner. As such, the toolkit takes into account the requirement to provide templates and ideas which are appropriate for the different levels at which education for entrepreneurship programmes may be delivered: primary education; secondary education; post-secondary/vocational education; and higher education. It is also able to accommodate the evaluation of activities which fall outside the traditional delivery of education for entrepreneurship programmes, such as campaigns which are targeted at the general population in order to create a more responsive attitude to entrepreneurship.

As resources for evaluation may be limited, the toolkit recognises that there will be considerable variations in the scale and scope of evaluations, as demonstrated by the *OECD WPSMEE Framework for the Evaluation of SME & Entrepreneurship Policies and Programmes* (OECD, 2008). Also, when describing the elements of, for example, particular methods of investigation, it elaborates on the advantages and disadvantages of the method or approach, and the contexts for which they are particularly appropriate.

The Resources Toolkit is presented in the Annex.

X. CONCLUSIONS AND RECOMMENDATIONS

Recent years have seen a dramatic increase, throughout many countries, in initiatives designed to introduce a greater degree of entrepreneurial expertise, in order to support the achievement of broader economic goals. In particular, there has been a growing emphasis on education for entrepreneurship within education systems. This has resulted in a plethora of activities which can be described as education for entrepreneurship programmes.

At the same time, there has been a relative dearth of evaluation data on which to construct a robust case for allocating resources to education for entrepreneurship activity. Although some evaluation studies have identified the positive impact of such activity on participants' subsequent behaviour, there is no overwhelmingly conclusive body of evidence to support the case for its continuing funding.

There are substantial difficulties in undertaking evaluations which provide findings to underpin a compelling case for education for entrepreneurship programmes. These include: the variety of programmes, with different objectives, which are on offer; the timescale which may be required to observe the long-term impact of programmes; the problems of assigning causality for subsequent behaviour to a single intervention; and the complexities of measuring 'soft' outcomes, such as increased self-confidence or attitudinal shifts. Thus, the variability in the objectives, content and delivery of education for entrepreneurship programmes militates against reliable data-gathering techniques.

The evaluations which have been carried out to date have varied greatly, in terms of both the methods used and the outcomes measured. A wide range of designs have been employed, from cross-sectional surveys and pre-test and post-test designs, to a small number of studies which have incorporated a longitudinal element. Methodologically, however, the majority of these studies are limited, because, they may lack pre-test and post-test, there are frequently no control groups and very few have a longitudinal dimension.

For many of the studies, the evaluation only lasted the length of the initiative, thus providing a one-off snapshot, carried out immediately after programme completion, rather than any attempt to track subjects over successive years. Overall, the number of evaluations carried out which have attempted to measure the impact of programmes appears limited. The most common focus of those evaluations has been on the rate of business start-up as an impact measure.

It follows from this that there is a need to generate a greater understanding of, and attachment to, the evaluation process, and the variety of methods which may be used. A principal aim of this WPSMEE study was to enhance such understanding and attachment, with the combination of the evaluation matrix, list of references and resources toolkit providing a foundation for those embarking on evaluation activity.

The following recommendations can be made on the basis of the foregoing analysis:

- the inclusion of an evaluation strategy should be a pre-requisite of any submission for funding of an education for entrepreneurship programme;

- that evaluation strategy should be a key component of the design stage of any programme;

- when initiating any form of substantive evaluation of education for entrepreneurship programmes, it is essential, at the outset, to ensure that there is an agreed operational definition of education for entrepreneurship, and the outcomes/impact which the study is seeking to measure;

- the approach, format, degree of sophistication and timescale of the evaluation should be determined by the resources available and by the complexity and scope of the programme;

- where resources allow, externally provided experts in evaluation methodologies and techniques should be charged with conducting the evaluation;

- evaluation findings, even where they indicate a lack of impact, should inform future decision-making about the effectiveness, sustainability and format of programmes

- effective and widespread dissemination of evaluation findings should be encouraged and supported, in order to enhance the development of a culture of evaluation.

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ANNEX. EVALUATION OF ENTREPRENEURSHIP EDUCATION PROGRAMMES: RESOURCES TOOLKIT

This toolkit has been designed in order to assist those who are involved in undertaking evaluations of education for entrepreneurship programmes. It is intended to provide a user-friendly guide to the different approaches and methods which may be adopted, dependent on the objectives of the evaluation.

About evaluation

Evaluation should be viewed as vital in order to ensure that optimum benefits are derived from the Education for Entrepreneurship programme. It is important to understand that the lessons learned through the evaluation process, including why things did not work, and what were the unanticipated consequences or side effects, are as valuable as the identification of exemplary practices. It should also be acknowledged that different sets of participants will have different sets of goals and expectations from the project. Furthermore, in order that all relevant data is collected from the outset, it is vital that the objectives of the evaluation, and the manner in which it will be conducted, are included in the design of the programme, and prior to its implementation.

What is evaluation?

Programme evaluation has been described as "the systematic collection of information about the activities, characteristics, and outcomes of programs to make judgements about the program, improve program effectiveness, and/or inform decisions about future programming" (Patton, 1997).

Another definition of evaluation is "the process of determining the merit, worth, or value of something, or the product of that process" (Scriven, 1991).

Thus, evaluation should be seen as an essential component of any education for entrepreneurship programme, because of its capability to enable a greater understanding of:

a. the impact of the programme, by considering the outcomes of the programme; and/or

b. how the programme may be improved, on the basis of its effectiveness and efficiency. For this to happen, there needs to be a process of reflection about the programme and how it has worked. This will include lessons about what has not worked well, as these can be valuable in avoiding difficulties which may inhibit the effectiveness of the operation.

Key stages in the evaluation process are:

- Establishing the rationale for the evaluation – why is it being conducted?
- Deciding what type of evaluation to carry out
- Setting out the aims and objectives of the evaluation
- Selecting appropriate individuals/organisations to carry out the evaluation

- Securing and allocating resources
- Identifying an appropriate approach, timescale, and data requirements
- Choosing the most appropriate methods for collecting and analysing data
- Deciding on methods of dissemination and follow-up

The following sections address these requirements.

Why evaluate?

Evaluation is necessary in order that we can determine to what extent a programme is being implemented appropriately and/or is achieving its stated objectives. In terms of education for entrepreneurship programmes, evaluation enables judgements to be made about the effectiveness, efficiency or impact of the programme. In particular, it seeks to provide information and robust evidence on which decisions about the future of a programme can be made, and to address questions such as:

- is it achieving its objectives?
- what impact is it having on its participants?
- what improvements can be made?

Depending on the questions to be explored, this often entails seeking the views of one or more of:

- programme participants
  - are sufficient numbers of the target group aware of and/or participating in the programme?
  - is there evidence of shifts in attitudes or behaviour as a result of the programme?
- those delivering the programme
  - are levels of take-up satisfactory?
  - what is working well on the programme?
  - what is not working well on the programme?
  - what improvements could be made to the content and delivery of the programme?
- providers of funding
  - does the programme offer 'value for money'?
  - is it achieving the desired outcomes, in terms of, for examples, individuals acquiring entrepreneurial skills and attitudes, setting up businesses etc?

Purpose of the evaluation

At the outset, it is necessary to define and clarify what the evaluation is seeking to achieve.

a. Why is it being carried out?

b. How was this need identified?

c. What are the specific aims and objectives?

d. Who will be the main recipients of the information and conclusions which emerge from the evaluation?

e. How will this information be used?

f. What resources are available? - what or who should be the sources of that information. For example, for process evaluations, it is usually necessary to obtain the perspectives of both those responsible for delivering the programme and those participating in the programme.

Types of evaluation

The model of evaluation to be undertaken will depend on:

- the type of programme which is under investigation – e.g. is it primarily concerned with embedding broad entrepreneurial skills, as in many school-based programmes, or is it offering practical advice and skills training related to business start-up.

- What do we want to know about the programme? – e.g. do we want to assess the implementation and delivery of the programme or do we want to measure its impact?

Two types of evaluation are commonly used in the evaluation of education for entrepreneurship programmes:

- ***Summative*** evaluation focuses on the outputs or outcomes achieved by the programme, and is sometimes called **impact** evaluation. This may be done through assessing the post-programme destinations or behaviour of participants or the cost-effectiveness of programme. It often requires an assessment of what would have happened if the programme had not been in place.

Evaluation of Berger Entrepreneurship Program (Ref 001)

The Berger Entrepreneurship Program was launched by the University of Arizona in 1983. The evaluation of this programme, which was conducted in 1999, was concerned with assessing its overall effect on those who had graduated. In addition, the effects on technology transfer from the university to the private sector, and of the entrepreneurship curriculum on other disciplines, were measured.

Evaluation of Junior Achievement Student Mini-Company Program (Ref 004)

This Netherlands-based programme seeks to develop an understanding of entrepreneurship by enabling vocational college students to set up and operate a mini-company. The evaluation focused on the programme in 2005-06, and assessed the outcomes in terms of the impact on the students' entrepreneurial skills.

- ***Formative*** evaluation, or ***process*** evaluation, assesses the process through which the education for entrepreneurship programmes have been designed and implemented, in order to identify ways in which improvements to how the programme is delivered can be introduced. It can explain how, why, and under what conditions a programme worked, or failed to work. The findings of a formative evaluation process can provide valuable feedback on issues such as the planning and design of courses, as well as aspects of the content and the teaching methods employed. For example, the evaluation may ask whether the programme is fulfilling its objectives and reaching those who were originally identified as intended participants.

Enterprise Learning at Key Stage 4 (Ref 015)

This formative evaluation considered a variety of secondary school based programmes in the United Kingdom which aimed to develop entrepreneurial attitudes and skills. The purpose of the evaluation was to identify and recommend good practice in the implementation of relevant programmes.

Northland Enterprising Teachers Initiative (Ref 002)

The Northland Enterprising Teachers Initiative is a professional development programme in New Zealand which seeks to encourage an 'enterprising' approach to teaching across the curriculum. The evaluation is a key element of this process as it assesses changes in pedagogy and school planning emanating from schools' involvement in the programme.

Importantly, evaluations can be designed to capture data which will fulfil the requirements for both summative and formative evaluations, as the following examples indicate:

Evaluation of Xlerate Programme (Ref 011)

Xlerate was introduced in Scotland with the aim of targeting young people in school who were perceived to be under-achieving, possibly due to their resistance to a formal school curriculum. The evaluation, which was conducted throughout 2005, sought to assess the whole programme, with a focus on both process and outcomes.

Regional Education for Enterprise Clusters (Ref 012)

This is a secondary school based programme in New Zealand, which is designed to develop young people's competences in innovation and managing and setting up a business. The first report of a two year evaluation investigates processes and outcomes, provides formative feedback and assesses conceptual viability and progress towards sustainability.

Longitudinal evaluation

The underlying premise of education for entrepreneurship programmes is that they fundamentally change attitudes and mindsets among their participants. However, the timescale involved in such changes cannot be predetermined. For some, it may occur relatively quickly, while for others, the lessons learned may not become apparent for some time. In terms of the evaluation of programmes, this can present a problem as far as the timing of the fieldwork for the evaluation is concerned. Moreover, observable manifestations of impact, as evidenced by entrepreneurial behaviour, may also take a considerable period of time to emerge.

For those who are exposed to education for entrepreneurship programmes during secondary education, and continue into tertiary education before entering the labour market, the time lag between participation in the programme and making career decisions will make it difficult to assess the relevance of inputs from their time at school. Also, the timescales required for the emergence of meaningful data vary considerably between different types of measures.

An acknowledged deficiency in the evidence base for the impact of education for entrepreneurship programmes is the scarcity of longitudinal research. Notwithstanding, these difficulties, it is clear that, wherever resources and timescales permit, longitudinal evaluation offers the prospect of deriving robust findings on which policy-makers may base recommendations and decisions with confidence. Moreover, a longitudinal study enables variables such as commitment and attitudes to entrepreneurship to be measured at the outset, with shifts in these attitudes being measured over time.

Enterprise Insight Hub Evaluation Study (Ref 008)

This evaluation consisted of a tracking study to assess changes over time in young people's attitudes towards enterprise, following the launch of the Make Your Mark Campaign.

Enterprise Education in Ireland (Ref 018)

This longitudinal study of a group of participants in education for entrepreneurship programmes in higher education included a control group in the first survey. The participants were followed up five years after the initial survey and their attitudes to entrepreneurship and business start-up explored.

Post-course evaluations

Quantitative data are most frequently collected and evaluations are often carried out in the form of a **post programme** or activity evaluation form. These typically seek information on:

- participant's level of satisfaction with aspects of the programme;
- changes in attitudes;
- knowledge about the areas covered in the programme; and
- perceptions about skills development.

This may be derived from: those designing the programme; teachers or providers; and participants.

In some cases, evaluation of education for entrepreneurship programmes is conducted solely by assessing the views and experience of the teachers or business partners involved in the programme and does not ask students about their experience.

Who should undertake the evaluation?

An important consideration when designing or commissioning a programme evaluation is whether this should be conducted by individuals from within the institution or agency providing the programme, or whether it should be carried out by external specialists.

- an **external evaluator** offers greater independence and objectivity, as well as the possibility of introducing a fresh perspective or ideas;
- an **internal evaluator** may offer a greater depth of understanding of the objectives and implementation of the programme, as well as getting better co-operation from those delivering the programme, and having the ability to effect change on policy and practice to a greater degree.

However, in most circumstances, external evaluation should be the preferred option, because of the greater likelihood of objectivity and for the subsequent credibility of the findings. This need not

necessarily be people who are external to the institution at which the programme is being delivered, but should certainly be those who are external to the programme itself.

In some circumstances **peer evaluation**, involving a similar programme which is undergoing evaluation, may be used.

Approach to evaluation

There is no single approach to the evaluation of education for entrepreneurship programmes, and therefore no single model which can be applied in all situations. It is more appropriate to think of evaluation in terms of a range of options or tools which can be selected and used according to the measure or programme being assessed. Clearly, factors such as the level of resources, both financial and professional time, which can be allocated to the evaluation, and the timescale within which results are required, need to be taken into account in deciding on the most appropriate approach to the evaluation. However, the type of programme being evaluated (e.g. whether to encourage the development of entrepreneurial attitudes, or to provide specific 'training' in the skills needed for business start-up) will be crucial, as will its scope (is it local or national?), its method of delivery, and whether the programme is voluntary within an institution or compulsory (in which case, it may not be possible to identify a control group).

A broad distinction can be made between *quantitative and qualitative* evaluation.

Quantitative evaluation

Quantitative evaluation entails collecting data from large samples of respondents often through a post -programme or activity evaluation form, or a large-scale survey. For example, programme participants may be targeted, rather than those delivering the programme, whose numbers would be smaller – although for a national programme which was delivered in the education system, it may be appropriate to survey teachers to ascertain their views on the delivery of the programme. They may be used in conjunction with qualitative assessments of attitudinal or perception shifts in a mixed method approach.

Determined to Succeed (Ref 010)

The largely quantitative evaluation of the Scottish Executive's Enterprise in Education strategy comprised telephone interviews with 469 teachers and 500 parents of primary and secondary school pupils, as well as 3,700 self-completion questionnaires from pupils.

Enterprise Learning at Key Stage 4 (Ref 015)

This formative evaluation considers a variety of secondary school based programmes in the United Kingdom which aim to develop entrepreneurial attitudes and skills. The purpose of the evaluation is to identify and recommend good practice in the implementation of relevant programmes.

Qualitative evaluation

Qualitative evaluation, and the methods associated with it, enables issues to be explored in greater depth by seeking to gain a better understanding of the perceptions and attitudes of programme participants and/or those delivering the programme. In particular, it may be used to identify shifts over time in attitudes to entrepreneurship. It is also highly appropriate for process evaluation, through gaining the views of participants and deliverers on how the programme has been implemented, and how improvements can be made.

The Dynamo Programme (Ref 017)

This programme is targeted at primary and secondary school pupils, using role model networks and curriculum materials. The evaluation had three qualitative strands: a review of relevant literature and documentation; case studies of schools and colleges of further education; and interviews and group discussions with key stakeholders.

Determined to Succeed (Ref 003)

The qualitative evaluation of Determined to Succeed sought to assess the impact of the programme on enterprise education in Scotland more generally by gathering the views of stakeholders. The methodology incorporated a combination of desk research, interviews with policy makers, key stakeholders, and local programme co-ordinators, and case studies of its operation in schools

Mixed methods

Many of the larger-scale evaluations of education for entrepreneurship programmes adopt a mixed method approach, incorporating elements of both quantitative and qualitative evaluation. Thus, the former may focus on establishing the characteristics and post-programme destinations of participants, while the latter may concentrate on perceptions of the usefulness of various components of the programme.

Northland Enterprising Teachers Initiative (Ref 002)

The methodology adopted for this evaluation combined the qualitative elements of case studies and surveys within a small number of selected schools, and a quantitative strand where a postal survey of teachers in a range of schools was administered.

Enterprise Learning at Key Stage 4 (Ref 015)

A mixed method approach was adopted for this evaluation, with qualitative elements of: observation of enterprise classes; visits to schools; and interviews with headteachers and providers of enterprise programmes. In addition, a quantitative survey of schools was undertaken.

Impact evaluations

A key element of evaluation approaches which intend to assess the impact of a particular programme is the *counterfactual.* This commonly involves the setting up of two groups from which to gather data – a 'treatment' group, composed of those participating in the education for entrepreneurship activity, and a 'control' group, composed of individuals with comparable characteristics, but who do not participate in the activity.

Evaluation of Junior Achievement Student Mini-Company Program (Ref 004)

The evaluation of this programme used a difference-in-difference approach with a control group of students (achieved sample of 220 students) who did not participate in the programme as a comparison to the participating group (achieved sample of 189 students).

Whole School Approach (Ref 009)

The evaluation of the Whole School Approach to Enterprise in Education initiative in Scotland examined the impact of the programme on 'total enterprise', and how the programme might be applied more widely.

However, experiments of this type are difficult to carry out in practice, and assume a 'common effect' across the whole treatment or control group. Also, the effects may only apply within the particular setting (e.g. educational level, geographical area) of the programme being evaluated, so that it may not be possible

to say what would happen when a programme is generalised in a different setting. It is therefore advisable to complement this approach with non-experimental methods.

Other variants of this approach may be applied. For example, 'matching' allocates each programme participant a comparable member of the control group of non-participants. This matching is usually made in terms of characteristics such as age, gender, socio-economic group, and level of qualifications achieved. For example, the evaluation of the Berger Entrepreneurship Programme at the University of Arizona (Ref 001), which surveyed a 'treatment' group of 460 entrepreneurship graduates (achieved sample of 105) and a control group of 2,024 non-entrepreneurship graduates (achieved sample of 406) controlled for year of birth, gender, ethnicity, high school graduation year, and educational and employment history.

A derivative of this approach is Propensity Score Matching (PSM), which uses a single measure (the propensity score) as an indicator of the likelihood of participation on the programme. There is therefore an assumption that the participants and their matched non-participants had an equal likelihood of embarking on the programme. This being the case, differences in, for example, attitudes, outcomes and activities can be attributed to the effects of the programme.

An approach which is favoured in a number of the more sophisticated evaluations of education for entrepreneurship programmes is that of difference-in-difference, whereby comparisons of the attitudes and experiences of the participant group and the non-participant control group are made both before and after the attitudes and experiences of the period of the programme. This enables a more robust measure of the impact of the programme to be derived. The study of the impact of entrepreneurship education on entrepreneurship competencies and intentions, conducted by the University of Amsterdam and the Tinbergen Institute in the Netherlands (Ref 004), adopted just such a framework. Outcome variables were measured before the start of the programme and at the end of the programme to produce "unbiased estimates of the program's impact".

Non-experimental methods can be powerful evaluation tools, particularly if the process underlying the outcome variables is well known, and data exist on the relevant measures. In such cases, matching offers a suitable method of evaluation. If it can be combined with a difference-in-difference approach, then certain unobserved measures can also be controlled for, which may improve the quality of the study.

Targeting and sampling

Data may be collected from a range of people, depending on the nature of the programme and the objectives of the evaluation. Typically, the key respondents from whom this data would be obtained in the course of evaluations of education for entrepreneurship programmes are participants, non-participants, teachers/lecturers, other staff from providing institutions and stakeholders, such as those responsible for sources of funding, employers etc.

Many evaluations require data to be collected from a sample of the total number of participants/stakeholders/programme deliverers etc. This may require:

- **random sampling**, where each member of the population has an equal chance of being selected, and which can ensure equal probability. A table of random numbers is used to select the sample.

- **systematic sampling,** which is very similar to random sampling, the difference being that, instead of a table of random numbers, the total population (N) is divided by the size of the sample required (*n*). If *n* is 100 and *N* is 1,000, the sampling fraction is 1/10 and therefore every 10^{th} person in the sampling frame will be selected for the sample.

Data collection

The methods of data collection to be employed for an evaluation will be partly determined by:

- the resources available – both financial and in terms of staff time
- the timescale of the evaluation – i.e. when the results are required
- what type of information is being sought
- who will be targeted to provide the data (e.g. programme participants, delivery staff etc)

A variety of methods may be considered. Here, we set out those most commonly used, with the advantages and disadvantages of the methods outlined. Clearly, they are not mutually exclusive, and an evaluation may comprise a combination of different methods.

Quantitative surveys

Quantitative surveys enable data to be collected from large numbers of respondents. In order for the results to be valid and credible, a pre-determined set of questions is administered in the same way to all respondents. This tends to make them more appropriate for impact evaluations than for formative evaluations, where greater depth is required.

The questionnaires which are used to collect the data may be administered in a number of ways, principally:

- postal, for self-completion
  - examples of postal or self-completion questionnaires can be found in the appendix to the evaluation of the Northland Enterprising Teachers (NET) initiative (Ref. 002), and the appendix to the national evaluation of Determined to Succeed report (Ref. 010). Other studies which used these research instruments are: Whole School Approach to Enterprise in Education (Ref. 009), Regional Education for Enterprise Clusters (Ref. 012) and Enterprise Learning at Key Stage 4 (Ref. 015)
- telephone interview
  - examples of evaluations where telephone interviews have been used include: evaluation of Enterprise Education in Schools (Ref. 016), with the questionnaire used for the interviews with schools representatives in an appendix; the national evaluation of Determined to Succeed report (Ref. 010); Whole School Approach to Enterprise in Education (Ref. 009); and the evaluation of Xlerate (Ref. 011).
- face-to-face interview
  - the evaluations of Enterprise Education in Schools (Ref. 016), and the Whole School Approach to Enterprise in Education (Ref. 009) provide examples of face-to-face interview schedules.
- online self-completion
  - online self-completion questionnaires were used in: the Make Your Mark Campaign evaluation (Ref. 008); the Whole School Approach to Enterprise in Education (Ref. 009); and the evaluation of Xlerate (Ref. 011).

The postal and online self-completion methods are considerably cheaper than telephone or face-to-face interviewing, can be delivered quickly to large numbers, and do not run the risk of interviewer bias affecting the responses which are recorded. However, they require the questions to be relatively simple and unambiguous, as there is no control over whether the respondent has understood the question in the way in which it was intended to be understood.

Questionnaires

The advantages and disadvantages of self-completion questionnaires can be summarised as follows:

Advantages

- Low cost
- Can be administered quickly to large numbers
- Avoid interviewer bias
- Standardised questions make all responses comparable
- Relatively easy to analyse (online questionnaires can be pre-coded)
- Respondents have time to think about their answers

Disadvantages

- Low response rate
- Self-selected sample, which may be biased
- Require simple, unambiguous questions to avoid misunderstandings by respondents
- Questions are not necessarily answered in the same order
- Difficult to explore complex issues in depth

Telephone interviews, while being more expensive and time-consuming than self-completion methods, are also relatively inexpensive. However, there are drawbacks in terms of difficulties in reaching some target respondents, and time restrictions – the length of time which individuals can be expected to give to a telephone interview limits the degree of depth which can be explored.

Online questionnaires are extremely cost-effective, but the sample obtained may be skewed due to some potential respondents not feeling comfortable or confident in responding in this way.

Questionnaire design

The design of the questionnaire can be critical, not only in encouraging an adequate response rate, but also in ensuring that the data obtained meets the objectives of the survey. It is therefore essential that all questions are rigorously assessed in terms of whether they will be likely to provide information which is relevant to the purpose of the study.

A choice can then be made about whether the questions should be 'open' or 'closed'. *Closed questions* are those which restrict the respondent to a selection of pre-coded answers. They have the advantages of being easier to analyse, because the range of possible responses is known in advance, and a coding frame can be formulated before the questionnaire is administered. For evaluations of education for entrepreneurship programmes, they may be used to determine the characteristics of participants and the programme in which they were engaged, as well as providing evidence of the impact of the programme, for example in determining the post-course activities of participants. However, by restricting the potential range of answers in this way, they may inadvertently force responses into categories which are not wholly representative of the respondent's views.

Open-ended questions allow the respondent to answer in their own words. Importantly, they also allow the respondent to answer in whatever way they wish. While this may generate a wider range of responses, and may more accurately represent the perspectives of those participating in or delivering the programmes, it does make analysis of the responses from the whole sample more difficult and time-consuming. There can also be a problem if the respondent strays from the main issues being addressed.

Whichever type of question is used (and many questionnaires comprise a combination of closed and open-ended questions), the layout of the questionnaires can be vital in eliciting a good response rate. The key points to remember are:

- keep the length of the questionnaire within reasonable limits, so as to avoid putting off the respondent;
- ensure that the layout is consistent, and easy to navigate;
- allow sufficient space for open-ended questions;
- be clear and precise in instructions for completion, especially in terms of the routing of questions

Qualitative research

Qualitative methods enable issues to be investigated in greater depth. This is especially important when conducting formative evaluations, where perceptions of the way in which an education for entrepreneurship programme was delivered, and its subsequent usefulness and value need to be examined in detail. The methods used may include in-depth face-to-face interviews, focus groups, case studies and observation. For example, the evaluation of Determined to Succeed in Scotland (Ref. 003) incorporates: interviews with policy-makers and local authority co-ordinators, as well as case studies, while the evaluation of the Dynamo Programme in Wales (Ref.017) has a combination of a literature review, school and college case studies, interviews and group discussions.

Interviewing

Face-to-face interviews may be structured in different ways, ranging from those which follow a fully structured questionnaire, to those which are semi-structured or unstructured, using topic guides which identify the broad themes or topics to be discussed, rather than specific, tightly-defined questions. In all cases, they enable the investigation of views, experiences, outcomes etc to be conducted in greater depth. This is particularly important where complex issues, such as the degree to which a particular programme has impacted on an individual's acquisition of entrepreneurial skills, or on their preparedness to countenance setting up their own business, are concerned.

The advantages and disadvantages of interviews can be summarised as:

Advantages

- High response rates can be achieved
- Complex issues can be explored in depth
- Respondents can be asked to clarify or expand upon the answer they have given
- The data obtained is often rich in terms of detail and insights
- Sensitive issues can be probed
- Verbatim quotation of responses can provide powerful evidence when reporting

Disadvantages

- Time-consuming to set up and carry out
- Relatively expensive
- More difficult and lengthy analysis phase
- Susceptible to interview bias or misinterpretation
- Require considerable skill on part of the interviewer

Focus groups

Focus groups composed of samples of programme participants or course teachers, enable people to share experiences and draw out a range of views or perceptions, e.g. about the usefulness of a particular education for entrepreneurship programme or the way in which it is delivered. They can be particularly useful when conducting formative evaluations of programmes, as they can encourage participants in the groups to develop ideas for addressing shortcomings or problems and for improving the programme. Examples of the use of focus groups include the evaluations of the Whole School Approach to Enterprise in Education (Ref. 009), Regional Education for Enterprise Clusters (Ref. 012) and Xlerate (Ref. 011).

The advantages and disadvantages of focus groups can be summarised as:

Advantages

- Cheaper than individual interviews
- Highlight a range of perspectives
- Generate fresh insights into issues
- May develop solutions or improvements to current practice

Disadvantages

- Time-consuming to set up and carry out
- Relatively expensive
- Require considerable skill on the part of the interviewer
- Difficult to analyse and attribute weight to points made
- Discussion may be dominated by a few individuals in the group

Case studies

Education for entrepreneurship programmes lend themselves to different types of case studies. For examples, case studies of individuals could track their experiences of a programme, and identify difficulties which had occurred and benefits which had accrued. The individual who was the subject of the case study would be interviewed at regular intervals and possibly asked to record events and their views about them in a diary.

In contrast, a case study could be undertaken of the implementation and delivery of a programme within an institution. This may involve regular collection of information, by any of the methods described above, from a range of key stakeholders, notably programme teachers, the management of the institution, funding bodies etc.

The evaluation of the Northland Enterprising Teachers (NET) initiative in New Zealand provides a good example of the case study approach. In order to assess the effect which the programme had had on the schools, and especially on the curricula, the case studies involved:

- a structured interview with the principal;
- a structured interview with the enterprise co-ordinator;
- collection of any school documentation which might include reference to Education for Enterprise (E4E) (school policy documents, planning and reporting frameworks, curriculum plans, etc.);
- (where possible) a structured interview with another teacher involved in E4E; and
- focus group interviews with a sample of students involved in E4E.

Observation

Observation is another qualitative method of collecting data, especially about the delivery of courses and the responses or activities of programme participants. The evaluation of Enterprise Learning at Key Stage 4 in the United Kingdom (Ref. 015) included observations of enterprise classes.

Evaluation of Young Enterprise Scheme (Ref 027)

Members of the evaluation team observed the activities (e.g. decision-making about products, marketing and individual roles) of a group of scheme participants over a seven month period. This entailed being present at 15 team meetings, as well as the group's presentation at a Trade Fair. Other groups were observed on a less frequent basis. The observations enabled the evaluation team to formulate their survey research instruments.

The advantages and disadvantages of observation are:

Advantages

- Provides greater insight of programme delivery and participant behaviour than is possible through individuals' accounts
- The data collected is rich

Disadvantages

- Difficult to gain permission for access
- High cost
- Time-consuming
- Potential for bias or misinterpretation on the part of the observer
- Those who are being observed, and are aware of it, may inadvertently behave differently to their normal behaviour.

Analysing data

An essential aspect of the process of planning an evaluation is to think through, at the outset, how the data collected will be analysed. It is definitely not something which can be left until after the data has been collected, as it requires adequate time, resources and expertise to be allocated to it. Moreover, the capability and capacity for undertaking analysis should be a key factor in deciding the nature and content of the instruments to be employed in data collection.

The nature of the data collected, whether it is quantitative or qualitative, will determine the type of analysis to be carried out. At a basic level, decisions about how the data is to be analysed will be dependent on:

a. What the evaluator wants to know; and

b. What the 'findings' will be used for

As far as a) is concerned, a choice can be made between:

- *Univariate* analysis, which focuses on one characteristic of the sample (e.g. the proportion of a course cohort who successfully completed the course). This is essentially descriptive, with the results often presented in the form of a frequency table. An important consideration when calculating percentages is whether to include those in the sample who did not respond to a particular question. If they are excluded, then this must be made clear.

- *Bivariate* analysis, which focuses on two characteristics, or variables, and attempts to establish a relationship between the two. The data is presented in crosstabulations, which enable an association between the two variables to be identified. For example, there could be a relationship between participants' prior educational achievement (or their social class background) and their level of attainment on a course.

- *Multivariate* analysis enables examinations of more than two variables to be carried out.

Reporting and interpreting findings

When undertaking the reporting and interpretation of the findings from an evaluation, it is important to re-visit the objectives which were established at the outset of the evaluation. This will then lead on to identifying two crucial components of the reporting process:

1. The target audience for the findings of the study. There is likely to be a number of individuals and groups who will be interested in at least some aspect of the report. For example, national policy-makers may use the findings on the impact of a programme to decide on its future sustainability, especially where government funding is provided. Evidence of a positive impact could be used to support the case for future funding. They may also need to gain information about the implementation and delivery of the programme, so that any lessons learned can be taken on board when deliberating on the appropriate design for a more widespread roll-out of the programme.

   At the same time, provider institutions (e.g. schools, colleges, higher education institutions) may be interested in those aspects of programme content or delivery mechanisms which have been well-received by participants, or which have been regarded as problematic, in order that curricula and administrative arrangements can be amended appropriately. Participants in the study, and students more generally, will be interested, especially if the evaluation throws light on the possible outcomes of their engagement with an education for entrepreneurship programme.

2. What are the key themes and issues emerging from the evaluation which will deepen our understanding of the processes involved and help to shape future formulation and delivery of education for entrepreneurship programmes? The presentation of findings should reflect the relative importance of key themes and issues which emerged. This should be apparent in the space and emphasis which they are accorded, so that the balance of the report is in accordance with the weight of the data.

Different formats and methods can be used for disseminating the findings of an evaluation, including seminars, conference papers, journal articles, press releases, Powerpoint presentations etc. Some will be more appropriate for different audiences than others. However, the core output of an evaluation is likely to be a written report. The structure of that report will depend, among other things, on the nature of evaluation and the number of data-gathering strands which were used. Pfatteicher et al (1998) suggest that the main components of any report should be:

- *Introduction* – this provides an appraisal of the purpose and objectives of the evaluation, including the key themes and issues pertaining to the focus of the study, and the contextual background, which may refer to the policy context in which the programme under evaluation has been developed. It will also present the reader with a signpost for what will be addressed in each of the following sections of the report

- *Methods* – the methods for identifying and selecting the sample, and gathering and analysing the data will be discussed, along with a description of the characteristics of the sample

- *Findings/Themes* – this represents the core of the report, with a description and interpretation of the findings. Tables, charts and quotations from respondents may be used to emphasise the main findings

- *Conclusions* – this section may be the most significant for policy-makers, as it provides the opportunity to draw together the main points arising from the study and to discuss their implications. It may also be used to spell out some recommendations for future policy and practice

Appendices – these may be used to locate copies of the research instruments and other material, such as detailed analytical tables, which may be referred to by the reader to substantiate and gain a deeper understanding of the basis on which the finding