MEASURING ENTERPRISE POTENTIAL IN YOUNG PEOPLE: DEVELOPING A ROBUST EVALUATION TOOL

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Abstract

Enterprise education is a mandatory part of the national curriculum, and all secondary schools in England must provide some kind of enterprise education for pupils. This ranges from work experience and enterprise programmes delivered by voluntary organisations, to economic literacy classes. The aims and objectives of these programmes are many and varied, making the task of evaluating them fraught with difficulties. Indeed, many evaluation studies of enterprise initiatives in general, have been criticised for a lack of scientific rigour. If there is inadequate empirical evidence about the efficacy of these programmes, then how do schools decide which ones to choose? How do programme providers develop their content and reach intended target populations? Worse, how do policy makers make decisions based on the varied and often contradictory aims and objectives of enterprise initiatives, about the design and development their policies?

The aim of this research is to try and help to answer some of these questions by developing a methodology for evaluation studies that could be widely used on enterprise education programmes. By using the same methodology, comparisons can be made between different programmes, and take into account the differential impacts on different populations. Specifically, the main objective was to develop a robust programme evaluation tool, which could be widely used to evaluate enterprise education programmes targeted at young people in schools.

This research involved the design and piloting of an attitude scale to measure enterprise potential in young people still at school. The development of the scale involved following accepted procedures for scale development, including reliability and validity testing. Two pilot studies are reported in this thesis, along with a longitudinal evaluation of a year-long Young Enterprise Company Programme. By using the attitude scale it was possible to design a methodology using pre-and post-testing, with control groups. Scores on the attitude scale were then compared using a series of statistical tests. This approach was thus able to overcome many of the criticisms frequently made of evaluations of enterprise initiatives. The scale enables researchers to take into account other moderating factors, which may influence attitudes towards enterprise. For policy makers the scale can provide evidence of the efficacy of different types of enterprise education programmes for different target

groups, thus helping to identify how best to target resources and investment. The attitude scale can also highlight the potential impact of contextual and demographic factors such as type of school, ethnic background, and a family background of business ownership.

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Chapter One: Introduction

1.1 Introduction

The aim of this research has been to make a contribution to our understanding of the role of enterprise education, particularly in schools, through the design and development of a robust programme evaluation tool, which can contribute to improved research evaluation methodologies. Improved methodologies are needed, it will be argued for two main reasons. The first is that previous evaluation methodologies have been criticised for being superficial, lacking in control groups and longitudinal designs (Levie and Hart 2009; Greene 2005; Hytti and Kuopusjarvi 2004; Storey 2003). Secondly, reliable evidence is needed, based on sound evaluations, to inform policy makers and programme providers about the efficacy of different types of enterprise education programmes. This last point becomes even more important given the continued investment by governments in developing an enterprise culture and more enterprising individuals.

The importance of an 'enterprise culture' to the UK's future ability to remain competitive in a global economy was the focus of a recent Enterprise White Paper (HM Treasury, BERR 2008). Encouraging 'enterprise' has become a policy priority in response to a recognition of the contribution enterprise and the small firm economy make to the UK. The promotion of enterprise is relevant to a wide range of policy issues across several government departments, and reflecting different policy objectives (Kellard *et al.* 2002). These government departments include: the Department for Business, Innovation and Skills (BIS); the Department for Communities and Local Government (DCLG); the Department for Work and Pensions (DWP); the Inland Revenue and Customs; the Social Exclusion Task Force; and the Equalities Office. In policy terms therefore, enterprise has many different functions in a wide range of contexts including local regeneration in areas of deprivation; welfare to work solutions; increasing the number of small firms for economic development, and finally as a route to employment for disadvantaged groups such as ethnic minorities and disabled people (ODPM 2004; Kellard *et al* 2002).

Encouraging enterprise is perceived as a key to creating jobs and improving competitiveness and economic growth throughout Europe:

> "Europe needs to stimulate the entrepreneurial mindsets of young people, encourage innovative business start-ups and foster a culture that is friendlier to entrepreneurship and to the growth of small and medium-sized enterprises". (European Commission 2008)

In this context, enterprise is also conceptualised in a broad sense as encompassing more than starting a business. Instead, according to the European Commission:

> "... entrepreneurship should not be considered just as a means for creating new businesses, but as a general attitude that can be usefully applied by everyone in everyday life and in all working activities." (European Commission 2002)

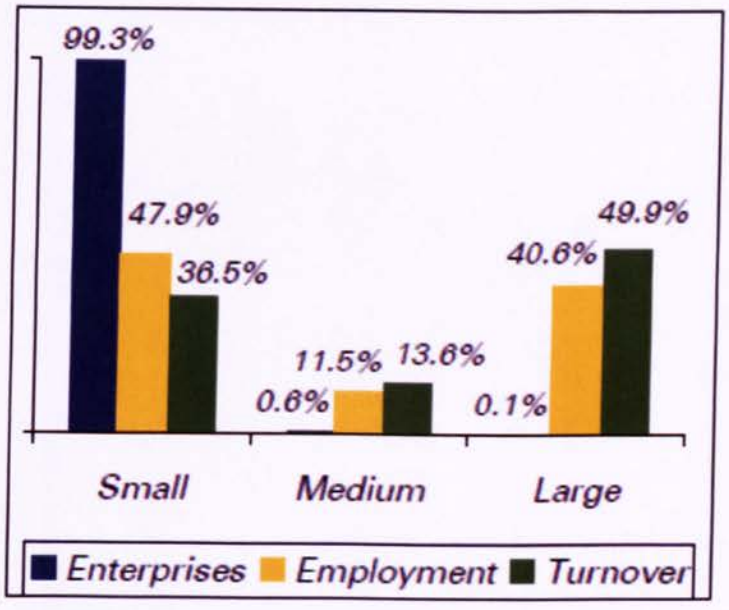
This view is reinforced by UK enterprise policies as described in the recent Enterprise Strategy Report

> "...Government will work with a range of partners to foster an enterprising spirit in everyone and across all walks of life, for example by supporting the work of the Involvement and Participation Association in their campaign to build employee engagement and promote the benefits an enterprising workforce can bring." (HM Treasury, BERR 2008)

Small firms contribute to wealth creation, it is argued and can make an important contribution to creating new jobs; in providing employment options

for people from under-represented and disadvantaged groups, and in creating a dynamic creative business environment, adaptable to change (BERR, HM Treasury 2008, OECD, 2001a; 2001b; EC 2003). National statistics demonstrate the contribution of enterprises to the UK economy. During 2008 small and medium-sized enterprises (SMEs) together accounted for more than half of the employment (59.4 *per cent*) and half of the turnover (50.1 *per cent*) in the UK (Figure 1.1). The importance of small firms to the economy has increased, it is argued, and will continue to be relevant, against a background of the decline of large scale industry, and the practice of out-sourcing services by both the public and private sectors (Hayward and Fernandez 2004). Small firms are also perceived as playing a key role in the new knowledge economy, which is replacing historical dependence on large scale industries in the UK (BERR 2008).

Figure 1.1 Share of enterprises, employment and turnover by size of enterprise in the UK 2008



Source: Department for Business Innovation & Skills (2009)

Furthermore, promoting enterprise is also perceived as one potential solution to youth unemployment, which has risen in line with the decline of large scale

industries in developed countries (OECD, 2009a; EU, 2008; 2002). Using enterprise as a mechanism to combat the increasing problem of youth unemployment, has been advocated by international organisations such as the United Nations. A team of specialists on entrepreneurship and poverty alleviation meets regularly to discuss the role of youth entrepreneurship at the United Nations Economic Commission Working Party on Industry and Enterprise Development (United Nations 2004). The use of enterprise initiatives to address youth related issues is also prevalent in UK government policies. The Enterprise White paper advocates changing attitudes to develop an enterprise culture in the UK, and a main focus is on schooling as a conduit for fostering 'enterprise'. The national awareness raising campaign, 'Make Your Mark', run by Enterprise UK (formerly Enterprise Insight), a coalition of the leading business membership bodies and the main delivery organisations for enterprise education, aims to promote enterprise to young people. The aims of Enterprise UK are to raise awareness of enterprise and thereby have a positive influence on business start-ups; social enterprises; and on creating more enterprising employees.

Substantial investment has been made, by previous UK governments, in primary, secondary and tertiary institutions over the last decade, and enterprise education is now a mandatory requirement in secondary schools (BERR 2008; Ofsted 2005). It was an early review of young people's attitudes to enterprise in the UK that underpinned the rationale for an increase in spending on enterprise education in schools (The Davies Review of Enterprise and Economy 2002). This review found that entrepreneurs are viewed, on the whole, in a positive light, but most young people surveyed would not want to run their own business, because of the risks involved and because they lack the skills and experience needed (Davies 2002). The Davies Review recommended a significant expansion of entrepreneurship and enterprise education in schools. But, just how sound was the evidence on which this policy focus was based?

Evidence to justify investment in enterprise policy initiatives can be provided by research studies into the impact initiatives have on various populations.

Critics argue, however, that there is little European evidence about the returns made on such investments in enterprise education (Hytti and O'Gorman 2004). One reason for this lack of evidence is an absence of reliable independent research (Storey, 2000). A widespread increase in enterprise education has not been accompanied by independent research into the impact it has on young people and the benefits, if any, they may derive from taking part (Peterman and Kennedy 2003; Davies 2002). Part of the problem is the lack of clarity with which the many aims of enterprise policies are specified (Storey 2003). Evaluations of enterprise programmes are necessary to provide evidence on their effectiveness to policy makers and to guide future enterprise policy direction. To be effective and provide accurate information, however, evaluations need to be rigorous and meet certain necessary conditions (Storey 2003;2000; Westhead, Storey and Martin 2001; Peterman and Kennedy 1999).

Independent academic evaluations are more likely to be rigorous and are therefore recommended by researchers (Storey 2003; 2000; Curran and Blackburn 2001). Despite the increase in enterprise programmes internationally, there is an acknowledged lack of evaluations that meet the necessary conditions. Most programme evaluations are simple monitoring exercises carried out as feedback for providers and funding agencies. Instead of sound evidence, therefore, the increasing policy emphasis on developing an 'enterprise culture' in the UK and elsewhere appears to rest on universal broad assumptions about the benefits of enterprise to the economy and society, rather than on detailed empirical evidence.

Storey (2003; 2000) has highlighted the inadequacy of many of the existing evaluation studies of enterprise policy initiatives. He has developed a hierarchy of six evaluation methodologies as a framework by which studies may be assessed. The hierarchy ranges from simple feedback forms, deemed the most inadequate, through to before and after studies with control groups and objective measurement, adequate to provide robust evidence to underpin enterprise policy initiatives.

Using Storey's hierarchy, Hytti and Kuopusjärvi (2004) compared evaluation methodologies in six European countries and found that most of these were lacking in rigour and therefore were unable to provide the kind of evidence needed by policy makers to justify investment in enterprise initiatives made by national governments. The Davies Review (2002) which prompted an increase in spending in the UK used a limited cross-sectional methodology including a telephone survey of 604 young people aged 15-18. The survey found that fewer than 15 *per cent* of the sample had taken part in a mini-company enterprise scheme (Davies 2002), and the review went on to conclude that this finding indicated a potential gap in this kind of provision in schools. This review of enterprise and the economy was at best a snap-shot of the views of young people willing to participate in a telephone survey, as opposed to a longitudinal design using robust methodologies as advocated by Storey. Greene (2005) found that different evaluation methodologies can result in radically different evidence of the impact enterprise programmes have had. Greene's (2005) key finding was that simpler forms of evaluation tend to provide positive support, whereas more sophisticated evaluations are less positive.

One of the problems with many evaluation methodologies, identified by Hytti and Kuopusjärvi (2004), was a lack of appropriate research designs that enabled comparisons between both programmes and countries. As a researcher involved in evaluation studies of enterprise programmes in schools during 2000 - 2003, I also became aware of the need for appropriate research designs and for relevant research tools and which could be used to measure the impact of enterprise education on young people. My search for a reliable research tool to measure changes in young people's attitudes towards enterprise was unsuccessful. The range of different tools and methodologies that were discovered forms part of this thesis. This search for evaluation tools was prompted by my involvement in a number of different evaluation studies of enterprise programmes during 2000-20005, and the recognition that these evaluations would more readily meet Storey's conditions if such a tool were available . (Storey 2003; 2000).

This thesis charts my journey from becoming aware of the need for a customised evaluation tool, through the development of and piloting of such a tool, to finally, using the tool to evaluate a year-long enterprise programme in secondary schools in London in 2004-2005. Along the way, I had to review the many different approaches to entrepreneurship theory and make a decision about which approach I would use, and this part of the journey is presented in the literature review. It was also necessary for me to learn about evaluation methodologies, and to decide on the kind of evaluation tool I wished to develop; and to review and define good practices, which I could then follow. It soon became clear that a type of attitude scale with psychometric properties could address these methodological needs. The methodology chapter is a synthesis of this review and shows how good practices in scale development were defined. Developing a new research tool and an attitude scale, in particular, ideally requires extensive piloting using a number of different samples. I decided to conduct three pilot studies, to enable the development of the tool, prior to carrying out an evaluation study using the new tool. I also carried out a cross-sectional evaluation of an enterprise programme in secondary schools during this process which has not been reported in this thesis, to avoid repetition (Athayde 2009, 'Measuring enterprise potential in young people', *Entrepreneurship Theory and Practice,* March 481-500.)

Both the pilot studies, and the final evaluation study form chapters in this thesis. Since completing this research I have received requests by other universities to use the tool, which I have called the Attitudes to Enterprise test (ATE Test), for their own evaluation studies. Details of these developments and the use of the tool in Australia, South Africa and the United States, along with a discussion of the limitations of the test, comprises the final chapter.

The aim of this chapter is to look more closely at some of the policies behind the drive for an enterprise culture, and at some of the stated aims: to create enterprising individuals; to increase the supply of (particularly) high-growth firms; and how enterprises, including social enterprises contribute to regeneration in disadvantaged neighbourhoods. After this overview the focus

of the chapter narrows to focus on young people and some of the evidence about their experiences of self-employment, and on what motivates and constrains their occupational choices.

The next section is concerned with some of the arguments that set out the benefits to society that flow from developing an enterprise culture. This is followed by a discussion of the debate surrounding definitions of "enterprise" and "entrepreneurship", and the implications of this debate for enterprise education and the aims of this research. The final section of this chapter is a guide to the rest of the thesis.

1.2 Why Enterprise May Be Good for Society

In effect there are two main arguments why encouraging enterprise may be considered a good thing: the first is an economic argument and the second is a social argument based on regeneration and social inclusion. The economic argument is that small firms are a source of innovation and have the potential to grow, create wealth and employment opportunities (Nesta 2008). An enterprise or a small business economy is a good thing in itself therefore, because it can be a source of market level innovation. The traditional economic role of the entrepreneur is as an innovator, who brings change to a staid marketplace, and thus infuses it with competition (e.g. Schumpeter 1934). This approach to entrepreneurship focuses on innovation which has been defined in policy terms as: "the successful exploitation of new ideas" (NESTA, 2008). The 'enterprise culture' and small firms are also perceived as a potential source of innovative products and services which can meet environmental concerns, coined as the 'Green Economy' (BERR 2008). The UK policy focus on an enterprise culture is part of a wider international policy shift towards fostering entrepreneurship.

The Organisation for Economic Cooperation and Development (OECD) held its first Ministerial conference on SMEs in Bologna, Italy in 2000. The result was the "Bologna Charter on SME Policy" hailed as the first major

international SME policy document, which was adopted by almost fifty countries (OECD 2009b) The "OECD Bologna Process on SME and Entrepreneurship Policies" was subsequently initiated. The aim of the process was to officially recognise the importance of SMEs as a driving force for job and wealth creation and to set out the role of the OECD in fostering SME competitiveness and growth throughout member countries. Subsequent conferences have since taken place and reports such as the OECD SME and Entrepreneurship Outlook have been published. The Entrepreneurship Indicators Programme is the latest OECD initiative and aims to develop a digest of indicators which can be used to compare enterprise activities across member countries (Ahmad and Hoffman 2008). National statistics vary, however, from country to country and making direct comparisons can be difficult.

An alternative method of measuring entrepreneurial activity, which enables cross country comparisons, has been developed by the Global Entrepreneurship Monitor (GEM). GEM measures the entrepreneurial activity of working age adults in 43 countries including G7 countries, Brazil, Russia, India and China (Bosma *et al.* 2008). In 2008 GEM classified the United Kingdom overall as having a medium level of entrepreneurial activity compared with other countries worldwide, and lower than the US, Canada and other nations apart from Russia, though greater than other G7 nations (Levie and Hart 2009). International studies, such as GEM, are beginning to provide national governments with evidence to underpin enterprise policy initiatives, and the continued policy focus on enterprise.

The anticipated outcomes of the previous government's policy focus on 'enterprise culture' in the UK were varied, and reflect both the economic and social arguments in favour of encouraging enterprise. As well as individual enterprise there is a wider policy agenda to help the most disadvantaged communities through local enterprise projects which take a holistic approach that includes a focus on regeneration by encouraging new business start-ups, including social enterprises to meet local social needs and environmental concerns (BERR & HM Treasury 2008; Turner 2002). Local Enterprise

Growth Initiatives (LEGI), introduced in 2006, required regional partnerships to develop ten year plans to deliver "a step change in entrepreneurial dynamism in their target areas" (Communities and Local Government 2008:4). Furthermore, "the integration of the wider key skills and a culture of enterprise are seen as equally relevant to employability (and competitiveness) and community regeneration (social inclusion) by various ministers and departments" (Turner 2002).

The assumption that an enterprise culture and a healthy small firm sector contributes to employment growth is based on the premise that an enterprise or small business economy can make a significant contribution to employment growth via job creation. In this context entrepreneurial activity has been linked to economic growth at both international and national levels, through growth in small firms and an increase in employment opportunities (e.g. Curtain 2000; White and Kenyon 2000; EC 2003; Acs 2006). The argument is made that small firms and self-employment create jobs not just for the owner manager, but potentially for other people as well.

A cross-sectional European study surveyed a representative sample of the working population in fifteen countries, to investigate the contribution of the self-employed to employment in the EU (Cowling 2003). The study found that though the UK self-employment rate is similar to that of other countries such as France and Germany, there were differences in the characteristics of individuals involved, and in the contribution these enterprises made to employment. The norm in the EU is for individuals with high educational qualifications to become self-employed, except in the UK, where craft related self-employment is more common. When it comes to creating employment opportunities the UK's self-employed are less successful than other European countries. In Germany 51 *per cent* of the self-employed have employees, in Austria 47.5 *per cent*, in Denmark 45.8 *per cent,* in Ireland 40.6 *per cent,* whereas in the UK it is just 29.1 *per cent.* Cowling (2003) suggests that the employment contribution of the self-employed is related to the level of education of the founder; and that self-employed graduates are more likely to create jobs for others, than those without a degree. It can be difficult to

assess the contribution to employment by firm size because data on firm size or employment statistics are not necessarily consistent and comparable from year to year. However, one study has looked at firm level data in the UK from 1997 to 2005 to demonstrate patterns of creation and destruction of jobs in different size firms (Hijzen *et al.* 2007). They found that one third of new jobs are created by the entry of new firms, while half of the jobs lost are caused by firm closures, and that therefore small firms (less than 100 employees) account for a disproportion share of job creation and job destruction (job churn).

According to recent statistics there were 4.5 million private sector enterprises in the UK, 75 *per cent* of which had no employees, including sole proprietors, and partnerships with self-employed owner-managers and companies with only employee directors (Brinkley 2008). In fact, Brinkley (2008) suggest that the main contribution of small firms to wealth creation and employment can be attributed to firms in the knowledge sector, such as for instance in finance and business services. From the evidence presented so far, it appears that an enterprise culture on its own will not necessarily lead to greater prosperity and employment opportunities in the UK, but that a targeted approach is needed. The UK government has recognised the potential importance of new firms founded by graduates with its programme of support for enterprise education in higher education.

So far, the arguments presented in favour of an enterprise culture have focused on the contribution of a thriving small firm sector, however, another argument is made about the competitive advantage of "enterprising" employees in any sector, and in both public and private spheres (BERR 2008; Keck and Buonfino 2008; Horne 2000; Gavron *et al.* 1998). These alternative conceptualisations of the meaning "enterprise" have also led to confusions about the aims of enterprise education. In the next section these various definitions of enterprise are explored.

1.3 Definitions of 'enterprise' and 'entrepreneurship'

According to Gibb (2003;1993), an early proponent of enterprise education, the term 'entrepreneurship education' has commonly been used in the United States, whereas in the United Kingdom the term 'enterprise education' is more likely to be used. Some of the confusion arises, Gibb argues, because the characteristics of enterprising behaviour are closely associated with the entrepreneur. Much of enterprise education in the UK is not aimed directly at stimulating entrepreneurship but at developing enterprising people and to inculcate self-reliance. For Gibb, enterprise education is a means of developing core enterprising behaviours, attributes and skills in young people. Among the skills he identifies are problem solving, creativity, and persuasiveness. The personal attributes are self-confidence, dynamic and resourceful, and the behaviours include persuading others, opportunity seeking, and taking risky actions in uncertain environments. For Gibb, the demonstration of enterprise is relative as well as contextual, and implicit in his model of enterprise education is that every student has some degree of enterprise, it is the strength and mix of skills, attributes and behaviours which differ.

Unlike Schumpeter's conception of the entrepreneur essentially as innovator, Gibb argues that the organisational dynamics of a small business and self-employment can supply the key components of an enterprise approach to learning. The basic essences of small owner managed businesses and self-employment are: a holistic task structure, where the owner manager has to decide everything and make the rules; and a learning environment which is discovery and action oriented (Gibb 2003; 1993). Replicate this learning environment in the classroom and students will learn/acquire enterprising skills, attributes and behaviours. Gibb goes on to make the claim that it is not essential that the environment is associated with a commercial independent business and that the learning goals may have nothing to do with business. What matters is that the "essential essences of the enterprising classroom environment" are maintained (1993). These essences are: uncertainty, learning by doing and discovery. Gibb has recently developed the theme of entrepreneurial versus corporate practices in his discussions of enterprise

education in HEIs (Gibb 2005). Gibb has replaced what he perceives to be the preominant 'Frankensteinian' model of the entrepreneur which he describes as a creation born out of corporate business concerns, with an 'alternate' model that has entrepreneurial values at its heart (Gibb 2005:17). These entrepreneurial values are associated with "the ways of doing things, organising things, feeling things, communicating things, understanding and thinking things, and learning things" (Gibb 2005:19). Recent educational guidelines, on the teaching of enterprise in schools, reflect Gibb's early conceptualisation of enterprise learning as something which ought to be present throughout the curriculum (Ofsted 2005). Enterprise learning is now an integral part of the Key Stage 4 curriculum (age 14-16), and enterprise education is one of the key curriculum areas set out in the 'Every Child Matters Green Paper (Treasury 2003).

Despite the spread of enterprise education there remains a lack of consensus about the definitions of 'enterprise' and 'entrepreneurship' education throughout the fields of practitioners, policy makers and academics. A European study on entrepreneurship and enterprise education programmes found that aims differed across countries and often objectives were unclear (Hytti and O'Gorman, 2004). In Norway and Austria the focus was on encouraging more business start-ups; Finland had a non-business focus on individual skills; and the UK and Ireland reflect both business and non-business aims. There is a "lack of clarity" and a "tension" caused by the existence of several working definitions of the term 'enterprise' (CEI, 2004) and cross-country comparisons are hampered by these differing aims and objectives (Hytti, and Gorman 2004). International organisations advocate the promotion of an enterprise culture as being critical to the growth of the European economy (e.g. EC 2003). But, unless there are clear definitions of what it is that is being promoted, this campaign will face problems getting its message across to the various European populations. Moreover, lack of clear definitions hampers the design and execution of research evaluations on the efficacy of enterprise programmes.

At the level of the UK Greene (2002) has demonstrated three different policy eras relating to 'enterprise' and young people since the 1970s. During the 1980s in particular there was a focus on public and private interventions, such as the Enterprise Allowance Scheme (EAS) aimed at increasing awareness of, and developing skills for entrepreneurship. However, there was little distinction made between entrepreneurship and self-employment. The ways in which national statistics about self-employment were used to make a case for increased entrepreneurialism in the UK were much criticised (e.g. Hakim 1989). Hakim argued that the self-employed were not the same as innovative entrepreneurs and would not make the same contribution in wealth and job creation. But, who is to say that a person who is self-employed in the beginning will not go on to develop their business and take on employees two or three years down the line?

The current enterprise education policy focus in the UK is on teaching enterprise skills and attributes to young people still at school in the belief that such skills contribute to all occupations and not only those within a business context and thus represent another supply side solution to (particularly) youth unemployment (DfES 2005). According to Ofsted (2005) the official office for education:

> "enterprising skills and attributes help in the creation of new businesses but are equally important for individuals to be successful in their personal lives. They are a key output of work-related learning, which became a statutory curriculum requirement for 14-16 year olds in September 2004." (Oftsted 2005:1)

Confusingly though, this policy aim of increasing enterprise skills at the individual level is often linked to policy aims to increase business start-up rates, particularly innovative firms (DIUS 2008). The implication being that an increase in the former will lead to an increase in the latter, which seems to undermine the argument that the usefulness of enterprise skills is not confined to a business context. This confusion in the UK appears to stem from the expectations of a wide range of outcomes, such as economic prosperity and reduced youth unemployment from the promotion of an enterprise culture. In

contrast, the EU agenda on entrepreneurship is very clear in its focus on increasing the start up of new firms (EU 2003).

There is a further debate about how enterprise should be taught. There is a disparity between existing subject based teaching and the competency based approach, which some argue is intrinsic to the teaching of enterprise skills, attitudes and competencies (Gibb 2000; 1993). Furthermore, if enterprise skills are not fixed personality traits but instead are competencies which can be learned and developed through experience, then they can be taught through experiential learning based enterprise programmes.

To address these conceptual differences and confusions this research study draws on a narrow and a broad definition of 'enterprise' and 'entrepreneurship' education, following that proposed by the OECD (2001a). A narrow definition holds that the purpose of enterprise and entrepreneurship education is to foster a positive attitude towards business founding, as a career option, and to equip pupils with the skills and attributes needed to run a business. By contrast, a broad definition extends the concept of 'enterprise' outside the boundaries of the business environment, to include generic skills deemed useful for successful employment in any field. Pedagogically, enterprise education is founded on the belief that certain skills attributes and behaviours associated with entrepreneurs can be nurtured through experience (e.g. Horne, 2000; Gavron *et al.,* 1998; Gibb, 1993).

The implications of narrow and broad definitions of enterprise for this research are twofold. Firstly, in developing the research tool both a narrow definition of enterprise namely "entrepreneurship" will be used, alongside the broader definition of enterprise skills and enterprising individuals. As Gibb (2005; 1993) argues enterprise education in the UK is aimed at developing enterprise skills in the broader sense and therefore it is likely that enterprise education programmes should be measured according to these aims. The application of the tool could be relevant in educational contexts where either a narrow, or a broad, definition of enterprise is used.

The next section looks specifically at the enterprise culture and young people. It examines the ways in which national government and international organisations such as the Organisation for Economic Cooperation and Development (OECD) are promoting enterprise and entrepreneurship as potential solutions to the problems of increasing youth unemployment.

1.4 Enterprise Culture and Young People

Governments around the world are placing increasing importance on the broad concept of 'enterprise' attitudes and skills (Leitch, 2006; OECD, 2001b). The Leitch (2006) report identified a skills gap as a major barrier to the future competitiveness of the UK economy. Although the UK has narrowed the productivity gap with major competitors, it lags behind the most successful economies and according to Lord Leitch a major reason is weaknesses in the UK's skills base. As well as increasing academic attainment, Lord Leitch recommends that core competencies such as problem-solving, communication, creativity and team-working should be embedded across all skills training and education. These skills are similar to the skills and attitudes often associated with entrepreneurship. It is not surprising therefore that enterprise education is seen as crucial to improving the economic well-being of the economy and individuals (Ofsted 2005). In the UK enterprise education is seen as contributing to the economic well-being of young people, one of the goals of the *Every Child Matters* programme (Treasury 2003), and the Education Act of 2004 (Ofsted 2005).

Enterprise skills are perceived by governments and international bodies as necessary tools for survival in the modern era of globalisation and new technology (Keck and Buonfino 2008; Ofsted 2005; OECD 2001b). Rapid globalisation, it is argued, has created greater job flexibility and the rise of 'portfolio' careers. The term portfolio careers was coined by Charles Handy (1990) and referred to an emerging trend of careers containing a combination of study, part-time and voluntary work, self-employment/agency work, and periods as an employee. The CBI's recent report on employability skills in the UK refers to the changing pattern of careers which includes part-time study

and vocational courses intermingled with periods of working full-time (CBI 2009). The report highlights the importance to employers of entrepreneurship and enterprise skills, which demonstrate innovation, creativity, collaboration and risk-taking.

Handy (1990) foresaw a future where flexible working patterns liberated workers who would have greater freedom over their careers, and the need to take responsibility for one's career is certainly a feature of the discourse on careers in the UK (Ofsted 2005; CBI 2009). However has job stability decreased, and if so has this led to greater freedom for workers? According to Handy (1990) job flexibility will be created by workplace changes, structural changes in large organisations and technological change, which have combined to transform the nature of work and careers. The negative corollary to job flexibility is a decrease in job stability, so has job stability decreased over recent decades?

On the contrary, comparative international research by the International Labour Organisation (ILO) shows that a high incidence of long-term employment is still the norm, rather than the exception, and likely to remain so for the foreseeable future, despite prevailing perceptions (Auer and Cazes 2003). They have identified a stable core of tenured jobs in industrialised countries, with increasing numbers of flexible short-term jobs only at the margins. Employment tenure increases with firm size and also with age of employee.

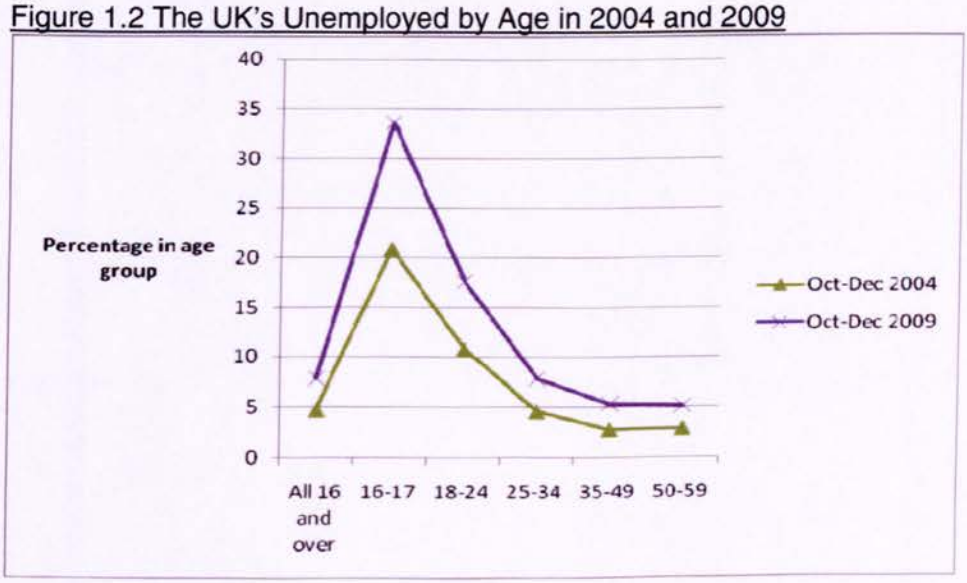
For many young people though, entering the labour market for the first time, long-term careers with one employer are in reality can no longer be taken for granted, replaced instead by fixed-term contracts and uncertain futures (Hayward 2004; OECD 2001a). Moreover, employers are looking for people who are flexible, innovative, decisive and easily adaptable to change: people with enterprise skills and attitudes (CBI 2009; Clarke 1997). The demand for employees with 'enterprise' skills originates from both employer organisations and from government departments (CBI 2009; Turner 2002). Indeed, improving the 'employability' of job-seekers was a key objective of New Labour's 'Welfare to Work' policies in the UK (DIUS, 2008; DfEE, 1997; 2001).

The Employability Skills programme was an initiative jointly developed by the Department for Work and Pensions (DWP), Department for Innovation, Universities and Skills (DIUS), Jobcentre Plus and the Learning and Skills Council (LSC). This programme was developed especially to meet the needs of Jobcentre Plus customers and includes a provision leading to an Employability Award that is based on the skills, behaviours and attitudes that employers want to see in people they recruit, such as self-reliance, team-working and communication and presentation skills. Once again, these skills are similar to many of the enterprise skills highlighted by employers' organisations such as the CBI (2009). This emphasis on personal individual skills, however, presupposes that young people are free to choose their future occupations. Is this really the case though? Evidence would suggest that there are, in fact, constraints on young people's choices.

1.5 Constraints and Motivators in Young People's Job Choices

The prevalence of youth unemployment is common to many developed and industrialised countries around the world. Youth unemployment is regularly double that of adults in many European countries as well as in Canada, the United States and Australia (OECD 2001a). Figure 1.2 demonstrates the greater likelihood of young people being unemployed in both 2004 and 2009.

Figure 1.2 The UK's Unemployed by Age in 2004 and 2009

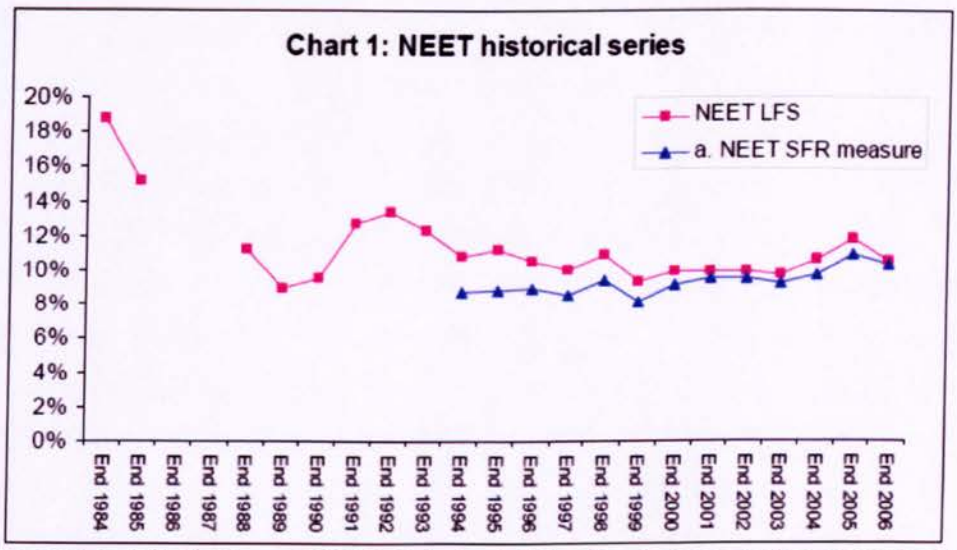


Source: Labour Force Survey (ONS 2009)

Of particular concern, in many countries, is the persistent and long-term unemployment of young people from the most disadvantaged backgrounds, who are often the hardest to help, and the most likely to be excluded from engaging with society in the long term (Payne 2003; Coles *et al* 2001; OECD 2001a). In the England the term Not in Education Employment or Training (NEET) is used to define young people most at risk of social exclusion and long term unemployment.

Figure 1.3 shows NEET rates in England from 1984 to 2006 using Labour Force Survey data, and statistical first release of participation in education training and employment by 16-18 year olds from 1993. The data shows high rates of NEET in 1984, 1991 and 1992, and a falling trend to 2003. Since 2003, however, there has been an increase in the proportion of young people classified as NEET with a slight fall by the end of 2006. So in 2005 the proportion was 12 *per cent,* which fell to 10.3 *per* cent in 2006.

Figure1. 3 NEETs in England from 1984 to 2006



Source: Statistical First Release (SFR) 'Participation in Education, Training and Employment by 16-18 Year Olds in England' and analysis of Labour Force Survey

The previous UK government set a target of a two per cent reduction in NEETs by 2011 and developed a package of initiatives targeted at this group (Payne 2003). These initiatives have included more apprentices, a wider

range of vocational diplomas, compulsory schooling to 18, and an increase in enterprise education.

In the search for policy solutions to the problems of youth unemployment, national governments and international organisations such as the OECD have turned all their attention towards the twin concepts of 'enterprise' and 'enterprise education' (OECD 2009a 2001a; EC 2002). The focus on enterprise has two elements, which relate to the narrow and broad definitions outlined earlier. It concerns both 'entrepreneurship' meaning self-employment and business ownership; and 'enterprise' meaning attitudes and skills often associated with entrepreneurs, but which are now perceived as crucial 'employability' skills in the increasingly competitive global business environment.

The need for new skills, the continuous updating of skills, and temporary employment prospects, all increase the difficulties young people face in job markets around the world. Enterprise education may help prepare young people for the demands of self-employment or for careers in a rapidly changing environment, but education is still only one factor among many which can influence attitudes to work and career trajectories. Tackling education alone may not result in the widespread attitudinal changes sought by employers and government departments, because there are other, structural, factors at work. Evidence from the British Household Survey, and the Youth Cohort studies in the UK, indicates a link between academic achievement, occupational choice and socio-economic background (Payne 2001; Brynner and Parsons 2001). What this evidence shows is that there is a positive correlation between wealth and achievement. Young people from wealthier families are more likely to attain greater academic achievement, attend top universities and earn more than young people from poor families. A recent report on access to the professions has shown that this relationship between wealth and attainment has actually strengthened since the 1970s (Cabinet Office 2009). The report claims that elitism in the professions, and a lack of focus on careers in schools, mean that young people from middle class as well as lower income backgrounds are being shut out from

professional jobs. "Unleashing Aspiration - The Final Report of the Panel on Fair Access to the Professions" concluded that without action to address Britain's 'closed shop' mentality, tomorrow's generation will miss out on a new wave of social mobility. Up to seven million more professionals are likely to be needed in Britain by 2020 as the global economy expands. A new focus is therefore needed, the report says, to unleash aspiration in all children and make social mobility the number one social policy priority for government.

The relationship between wealth and achievement is a complex one that one contemporary thinker, Bourdieu has attempted to explain using the concept of 'cultural capital' (Bourdieu 1973). Bourdieu's concern was to analyse inequality and class distinction at a structural rather than an ideological level, and to make explicit the power relationships in society transmitted through art and education. Cultural capital, defined by the father's occupation, is a framework of language, cultural and social morés, and knowledge, which have value and currency within the educational system, and through which social norms are transmitted and social hierarchies reproduced (Bourdieu 1973). Cultural capital is passed on, unconsciously, through the (linguistic) interactions of family, schooling, peer group, and location (Bourdieu and Passeron 1990).

Access to cultural capital is influenced by wealth, or lack of wealth. Furthermore, cultural capital is an inter-generational commodity, which can accumulate in subsequent generations. Nash (1999:116) takes Bourdieu's theory a step further by specifying the development of literacy-based cognitive skills as the principal form of 'effective cultural capital' acquired in predominantly middle class families. It is these skills which have the greatest value and currency in the educational system. These skills are manifest in communication skills, creativity and imagination, confidence in self-presentation and leadership, and not least high aspirations and career goals. In fact, many of these qualities are similar to the skills, attributes and behaviours which have been identified as the very 'enterprise' skills central to the recent increase in investment in enterprise education in the UK and elsewhere.

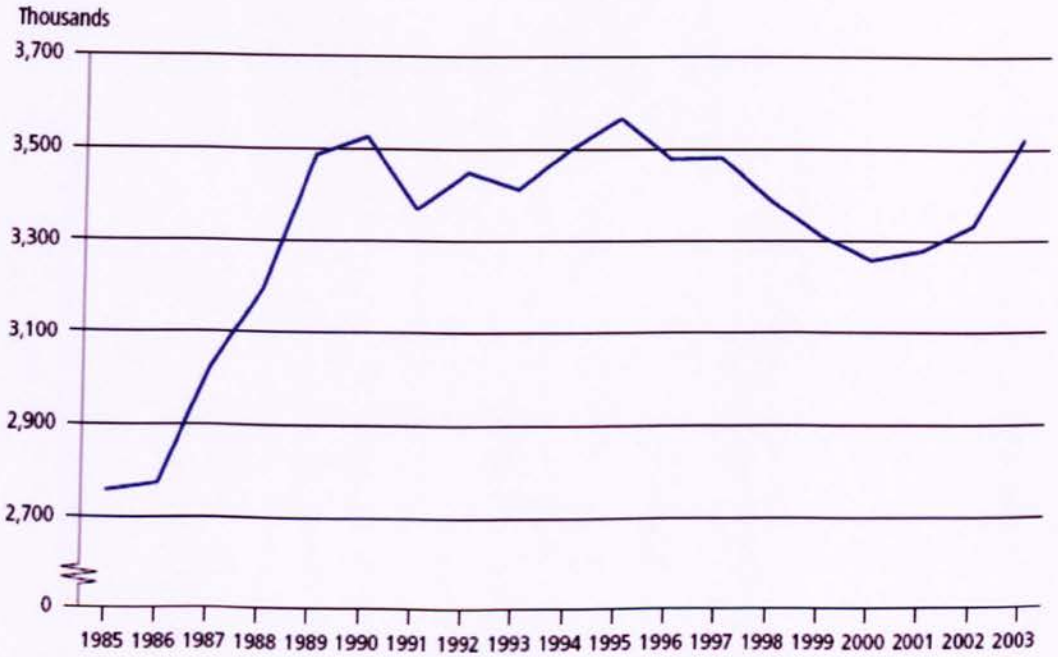
When it comes to choosing occupations and finding work young people from the most disadvantaged sections of society have the least choices open to them, through a combination of lack of educational qualifications and lack of cultural capital. Recent research has found that cultural capital is a key factor in final job status and occupational choice, and that job choices of young people tend to reflect their parents' education and occupation (Brynner and Parsons 2001; Bloomer and Hodkinson 2000; Furlong and Biggart 1999). Furthermore, basic numeracy and literacy, which are closely related to cultural capital, are also key factors influencing the kind of occupations young people may gravitate towards, through choice, or more often, lack of choice (Brynner and Parsons 2001). Given these constraints to young people's occupational choices, what have the motivations and drivers that htave led young people to choose self-employment?

1.6 Young People and Self-employment

There has been much debate over using self-employment statistics in debates about enterprise (Hakim1989). The European Commission's definition of small and medium-sized enterprises (SMEs) relates to employee size and turnover (EC 2003). The category of micro SMEs includes businesses with up to nine employees including businesses with no employees – the self-employed. It could be argued that a business may have no employees in its first year of trading and then take on employees in future years, therefore it is difficult to distinguish the self-employed firms that will grow from those that won't. During the 1980s when there was a policy focus on an enterprise culture, statistics on self-employment were used to provide evidence of the growth of enterprise in society (Greene 2002). Therefore a discussion of young people and self-employment is included here. First, the increase in the overall numbers of self-employed are presented and this is followed by a focus on rates of self-employment in young people. Another measure of enterprise that has already been mentioned is Total Enterprise Activity (TEA) as measured by the GEM surveys. This sections ends with more recent data concerning attitudes towards enterprise in the UK from the GEM survey 2008.

National statistics (Labour Force Survey) in the UK show that overall, the number of people who are self-employed has increased since the 1980s (Figure 1.4). One in ten of the working population was self-employed in 2002 though only one quarter was female. There were further differences by age, with larger proportions of older cohorts more likely to be self-employed throughout the period from 1980s to 2003. In the UK aspirations for self-employment have been shown to vary regionally (Henley 2007), and levels of nascent entrepreneurship differ from region to region, with London and the South East, typically having the highest rates in the country (Levie and Hart 2009).

Figure 1.4 Numbers of Self-employed 1985-2003

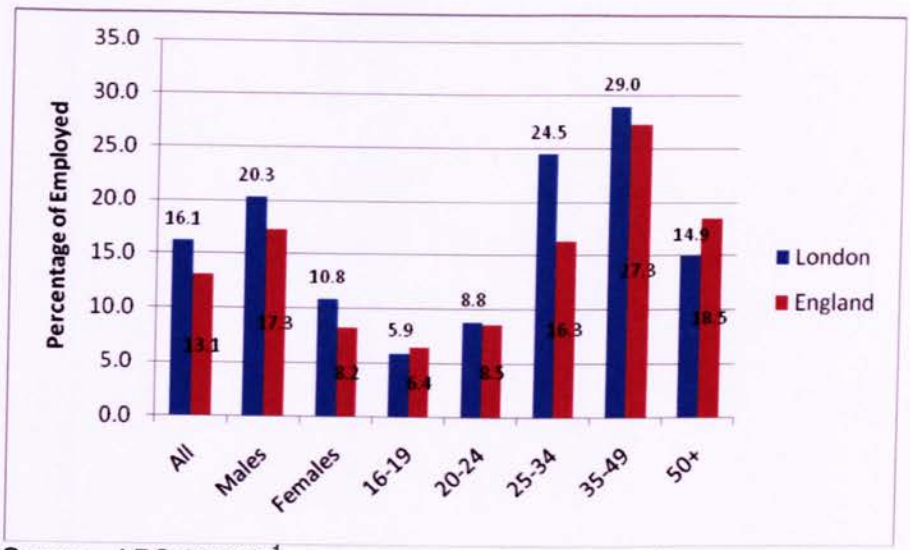


Source: Lindsay and Macaulay 2004

Business growth rates are historically lowest in the age-category 16-24 despite national government and EU subsidies to organisations such as the Princes Youth Business Trust (PYBT) (OECD 2001a). But, as the most likely age for starting a business is between 30 and mid-40s, when both financial and human capital, in the form of knowledge and skills, have been accumulated, the low start-up rates among young people are not so surprising

(Weir 2003). By looking at self-employment rates in different age cohorts in 2004/5, we can see that young people aged 16-19 are the least likely to be self-employed, followed by 20-24 year olds (Figure 1.5) The groups with highest rate of self-employment are 35 – 40 year olds.

Figure 1.5 UK Self-employment Rates in 2004/5by AGE



Source: APS 2004/5[1]

According to Greene, (2002) the climate of an 'enterprise culture' in the UK during the 1980s may have contributed to a rise of self-employment in young people particularly during times of high unemployment. During this time the conservative government launched the Enterprise Allowance Scheme (EAS). The EAS promoted self-employment through a twelve month allowance, which was greater than the benefit rate, that enabled people to start their own business. By looking at Labour Force Survey data during the period 1977 to 2000, Green (2002) has charted the rise and fall of self-employment in young people aged 16-64, to investigate the impact of the EAS and the policy focus on enterprise culture. Greene found that during the period 1983-1990 self-employment rates increased in 20-24 year olds increased from 4.9 *per cent* to 9.4 *per cent,* and in 25-29 year-olds from 8.7 *per cent* to 13.2 *per cent,* suggesting that the EAS did in fact have a positive impact on young people's participation in self-employment (Figure 1.6 and Figure 1.7).

[1] Annual Population Survey. www.ons.gov.uk/statistics

Figure 1.6 Female Self-Employed by Age

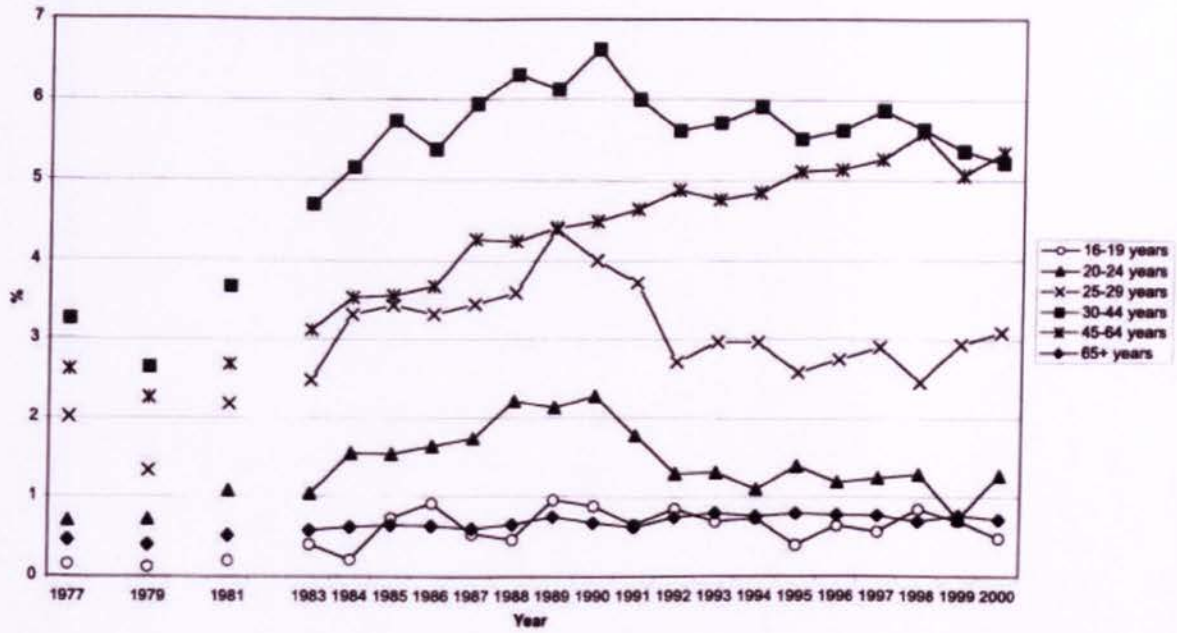
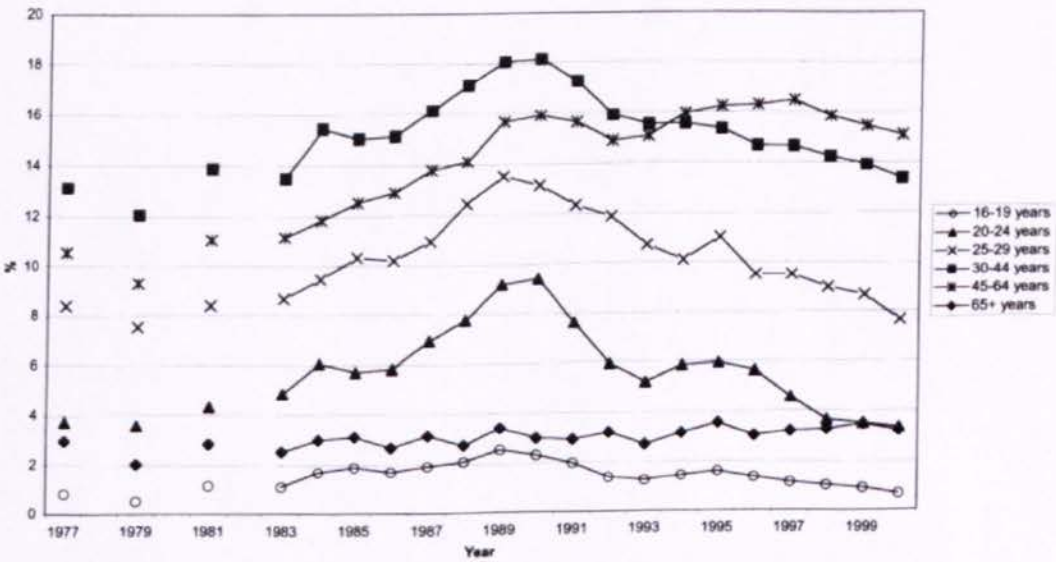


Figure 2. Percentage of the female working population with a main activity classified as self-employed, by age groups
Source: Greene 2002

Figure 1.7 Male Self-Employed by Age



Source:Greene 2002

However, Greene also found that these rates of self-employment in young people were not maintained during the 1990s. In fact, since 1991 the proportion of young people who were self-employed declined steadily, indicating that the upsurge during the 1980s was not sustained. What is

unknown, however, is whether young people who became self-employed during 1980s when they were in their early 20s contributed to the continuing rise in the percentage of 25-29 year-olds during the 1990s. If this were the case it would indicate that the enterprise culture had an immediate positive impact on young people in their early 20s, who became self-employed. It would also indicate, however, that young people who were teenagers during the rise of the enterprise culture were not more likely to go on to become self-employed when they reached their 20s during the 1990s.

This interpretation of the evidence finds support from a study of secondary school pupils in the UK by Curran and Blackburn (1990). They found that the ubiquitous theme of an enterprise culture in popular and policy discourse actually had little impact on sixth-formers aspirations to run their own business.

Research indicates that though business start-ups were more numerous during the 1980s, the quality of the businesses was lower than those started in the 1970s or 1990s, particularly in economically deprived areas (Green, et al. 2004). Research has also found that the Labour government's Welfare-to–work strategy, which included a self-employment option, was less effective in areas of high unemployment (Theodore and Peck 2001). Moreover, research on the EAS generally, has been critical of the blanket promotion of self-employment as a career option to a target market that included unemployed young people (Rees 1986: MacDonald and Coffield 1991; MacDonald 1996). Though not targeted specifically at young people estimates indicate that approximately one in four EAS participants were under 25 (Allen and Hunt 1985). Commentators have also drawn attention to the types of businesses being started under the EAS. Critics argued that unrealistic aspirations of business success were fostered in vulnerable young people, who ended up working at the margins of the economy, in high-risk ventures or in low-paid casual work (Rees 1986: MacDonald and Coffield 1991; MacDonald 1996). The type of venture is important to success and the contribution it can make towards economic prosperity and job growth (Huggins and Williams 2007). Furthermore, Mueller *et al.* (2008) found

regional variations in the impact of new firm start-up rate on employment growth. In East Anglia, Midlands and the South of England the effects were positive, whereas in some regions in Scotland, Wales, and the North East of England the impact was negative. They concluded that it is possible to have the wrong type of entrepreneurship – new firm formation that leads to zero or even negative subsequent employment. Human capital factors, such as level of education in a region were found to be highly correlated with these results, and the greater the human capital the more likelihood that new firms would lead to increased employment. This indicates that the impact of the EAS may also have been regional.

Research in both the UK and the US has found that not all aspiring young entrepreneurs are successful and many young self-employed people, particularly in the service sector, struggle to earn a living, often earning less than their employed counterparts (MacDonald 1991;1996; Blanchflower 2004; Williams 2004). Moreover, critics of the EAS also argue that the policy initiative was in fact a cynical attempt to decrease politically damaging rising levels of unemployment, by shifting large numbers of unemployed people onto the scheme (e.g. Greene 2002; Storey 2000; Gray 1998). The policy focus on an enterprise culture, of which the EAS was part, has been interpreted as a response to demand side structural changes, triggered by the decline of "smokestack" industries in the UK (e.g. Gray 1998; Storey 2000; Hayward 2004). The term 'smokestack' originates in the fact that these industries typified by the steel and auto industries, usually have large smokestacks for their operations.

In contrast the current policy focus on enterprise is more of a response towards the rise of the service sector, which is typified by a greater proportion of small firms, and the emergence of a knowledge economy, also characterised by small firms (Hayward 2000). Continued structural rationalisation in public and private sector spheres results in greater out-sourcing of services, which provides further market opportunities for small firms. What impact have these changes had on young people's attitudes

towards enterprise today? Evidence from GEM surveys can help to answer this question.

The Global Entrepreneurship Monitor (GEM) measures total entrepreneurship activity (TEA), which includes nascent entrepreneurs, that is people who have taken early steps towards setting up an enterprise. GEM also measures various attitudes towards enterprise and entrepreneurship. The TEA for young people aged 18-24 increased from 2.7 *per cent* in 2005 to 3.7 *per cent* in 2006 (Harding and Bosma 2006). Furthermore, 64 *per cent* of young people thought that entrepreneurship was a good career choice and 80 *per cent,* felt that entrepreneurs have a high status in society.

GEM also measures attitudes towards entrepreneurship in participating countries. Figure 1.8 shows the attitudes towards entrepreneurship among non-entrepreneurial people in six G7 countries and Brazil, Russia, India and China during 2008 (Levie and Hart 2009).

Figure 1.8 Attitudes towards entrepreneurship in G7 and BRIC countries 2008.

	I know someone who has started a business in the last 2 years	There are good start-up opportunities where I live in the next 6 months	I have the skills, knowledge and experience to start a business	Fear of failure would prevent me starting a business (for those who agree there are good startup opportunities)
G7				
UK	**24**	**27**	**44**	**38**
France	33	22	25	52
Germany	29		30	45
Italy	30	29	35	46
Japan	21	7	9	54
US	33	31	48	28
G7 average	28	23	32	44
BRIC				
Brazil	44	38	49	42
Russia	33	29	14	62
India	56	54	45	49
China (2007)	n/a	32	30	n/a

Source: Levie *et al.* 2009

There was a decline in the UK of the proportion of people who perceived there were good opportunities in the next six months from 35 *per cent* in 2007 to 27 *per cent* in 2008. In the US this figure rose from 20 *per cent* in 2007 to 31 *per cent* in 2008. However, fear of failure remains lower in the UK than other G7 nations apart from the US where it is considerably lower than in the UK.

1.7 Conclusions

This chapter has provided a contextual background within which to frame the development of a programme evaluation tool suitable for enterprise education programme. The first point to note is the increasing policy focus on enterprise by international organisations such as the OECD and the EU, and national governments like the UK. Arguments in favour of fostering and enterprise culture centre on both the economic benefits and social benefits of increased enterprise. An alternative conceptualisation of the meaning of 'enterprise' refers to a set of skills, attributes, and behaviours associated with the entrepreneur, such as creativity, risk-taking, leadership, and self-reliance (e.g. Gibb 2003). This broad definition of enterprise skills is integral to many international and national policy initiatives designed to foster enterprise in society and in particular in young people. Gibb's essences of an entrepreneurial environment are reflected in new UK government guidelines about on the provision of enterprise education in schools (Ofsted 2005). In a similar way the skills gap identified in the UK has been linked in part to a lack of enterprise skills in the workforce (Leitch 2006: CBI 2009). An enterprise culture is also being promoted as a means of regenerating disadvantage neighbourhoods (Kellard *et al* 2002). To address these concerns enterprise education is now a mandatory part of the curriculum, though there is no clear evidence about the outcomes of such programmes, because of a lack of evaluations that can provide independent rigorous evidence.

The problems associated with evaluations of enterprise policy initiatives was identified by Storey (2003; 2000) The shortcomings of evaluations of enterprise education programmes have been outlined by Hyti and Kuopusjärvi (2004). One of the problems identified in many studies is a lack of research

tools to objectively measure outcomes. The aim of this research was to develop a research tool capable of being used in evaluations of enterprise education programmes for young people. Such a tool could provide a means of comparisons between various programmes and different target groups. If young people represent a relatively untapped economic resource of new business start-ups and of economic growth then evaluation studies should be capable of informing both policy and practice in enterprise education. Given the policy focus on innovation more evidence is needed on the contribution that young people can make. Research has shown that young people have the potential to be innovative and have the dynamism and energy to carry through new ideas as illustrated by the high number of young entrepreneurs involved with internet businesses (Curtain 2000; OECD 2001a). The challenge for enterprise policy is to provide young people with the skills, knowledge and attitudes needed to set up successful ventures.

This chapter has chartered the impact of policy initiatives such as the EAS during the 1980s and its impact on self-employment rates in young people. National statistics show that it may have had a temporary positive impact on young people's propensity to become self-employed, but rates dropped again during the 1990s (Greene 2002). Critics have highlighted the marginal and insecure nature of many of the self-employed occupations during the 1980s (Rees 1986; MacDonald 1996). A tendency towards craft occupations has been found in the self-employed in the UK who are much less likely than their counterparts in other European countries such as Germany, Denmark, and Austria to be engaged in innovative businesses employing others (Binkley 2008; Cowling 2003). They are also less likely to be graduates. For this reason academic attainment, as well as enterprise skills are seen as crucial to the future prosperity of the UK (Leitch 2006). The fact remains that considerable investment of public money has been made to provide enterprise education in secondary schools in the UK, and that the evidence on which this investment has been made is weak.

The aim of this research, to develop a robust tool that could be used in independent evaluations to provide objective measures of the outcomes of

enterprise education, has the potential to contribute to this on-going debate. Such a tool would provide evidence for policy makers on the effectiveness of different kinds of enterprise programmes. The tool could also provide information to enterprise providers on the content, delivery, and targeting of various programmes for different markets.

The remainder of this thesis follows the plan set out in Table 1.1 below. A review of the concept of an 'enterprise culture', an analysis of its aims and objectives, and the impact on young people of the previous policy focus on enterprise during 1980s was the subject of the introductory chapter. This chapter addressed definitional problems surrounding enterprise and enterprise education, and looked at the potential role of evaluations.

A review of education policy is presented in chapter two. The role of enterprise education is reviewed in the context of education policy as a whole. Chapter three is a literature review of theories of entrepreneurship including trait theories, cognitive and social cognitive theories, and attitude theory. The main characteristics needed for entrepreneurship are identified, and the concept of 'enterprise potential' is introduced.

Table 1.1 Plan of the Thesis

Chapter Number	Title of Chapter	Content
1	Introduction	Review of 'enterprise culture': aims and objectives. The different aims of enterprise policy. Definitions of enterprise and entrepreneurship. Introduction to evaluation issues. Young people and job choices – the impact of cultural capital. Young people and self-employment rates.
2	Education Policy Review	A review of differing approaches to education policy in the England and Wales. The role of enterprise education in the context of the educational curriculum. Links between education policy and enterprise policy.
3	Literature Review	Theories of entrepreneurship, from trait theory to cognitive theories. Measuring entrepreneurship: psychometric and attitudinal scales. The main characteristics and attitudes for enterprise are identified and the concept of 'enterprise potential' introduced. A social psychological model is used to locate attitudes.
4	Methodology	A review of methodologies used to measure entrepreneurship. Distilling the main criteria for using attitude scales.
5	Developing and Piloting the Instrument	Describes how the instrument was initially developed and tested, using the criteria from Chapter 4.
6	Piloting Version Two	Describes the modifications made to the instrument following the initial pilot findings. Shows how the pilot testing was carried out on a new sample. Findings are compared to the criteria outlined in Chapter 4.
7	Evaluation of a Programme using the Instrument	This chapter reports on a pre and post test, longitudinal study, using the instrument to evaluate the impact of participating in a year-long enterprise programme.
8	Discussion and Conclusions	There is a discussion of the strengths and limitations of the evaluation tool and a discussion about how it could be used. Further research opportunities are explored. The evolution of the conceptual framework is explained and a new model for understanding the value of enterprise education is presented.

A critical review of methodologies used in entrepreneurship research is the subject of Chapter Four. The strengths and weaknesses of a number of studies and research instruments are considered, and the main criteria for a reliable and valid instrument are distilled. Chapter Five describes how these criteria were met during the development and initial testing of the instrument in the first of two pilot studies. This process and the findings of two early pilot studies have since been published in the peer reviewed journal Entrepreneurship, Theory and Practice in March 2009. The procedures used during the second pilot study are outlined in Chapter Six. This chapter explains how modifications to the instrument were made in light of the findings from the first pilot study. The modified instrument was then administered to a new sample to enable a further round of reliability and validity testing.

Chapter seven is an account of a longitudinal study, which used the evaluation tool to measure the impact of taking part in an enterprise programme, on young people's enterprise potential. This study shows how the evaluation tool can be used in evaluation studies and the kinds of comparisons and multivariate analysis enabled by such an approach.

The final Chapter Eight contains a discussion of the strengths and weaknesses of the evaluation tool and the research project as a whole. Opportunities for further research using the instrument are also explored. This chapter also charts the theoretical journey I made from a relatively simple model of attitudes to enterprise, to a more complex model showing the relationships between self-efficacy and enterprise attitudes. Then, building on the findings of the longitudinal study in Chapter Seven, I was able to also revisit discussions from the literature reviews, concerning different ideological approaches to educational theory, including Bourdieu's theory of cultural capital. By delineating the relationships between these theories, I was then able to develop a new model of enterprise education by economic and social needs. Therefore, in addition to the development of a robust evaluation tool, the thesis can viewed as a representation of the evolution of the conceptual framework that led to this new model for understanding enterprise education. Finally, the contribution made by this research project, and in particular the

model of enterprise education, to the debate surrounding enterprise education for young people is also assessed.

Chapter Two: Education Policy Context

2.1 Introduction

This study seeks to make a contribution to the debate about the efficacy of enterprise education in fostering positive attitudes towards starting a business. The current policy focus on promoting a culture of enterprise, as outlined in the previous government's Enterprise Strategy (HM Treasury and BERR 2008), and increased funding for enterprise education in schools, makes this an important and topical debate. Chapter One showed how international and national policy has increasingly focused on enterprise, and how this has led to an increase in enterprise initiatives, in particular enterprise education initiatives. As well as enterprise policy, a focus on enterprise education inevitably touches on education policy, and this Chapter will investigate the links between education and enterprise policies. I hope to demonstrate that historically there has been a tension in education policy which revolves around the role of schooling in providing a workforce to meet employers' needs (Kelly 2004;Yeomans 1998). Vocationalism has been used as a vehicle to equip pupils with the skills demanded by employers. On the other hand, education has also historically been seen as a mechanism to combat social inequality, its purpose being to equip pupils with life skills or competencies to raise them out of poverty (Jones 2003; Yeomans 1998). Rather than resolving this debate, enterprise policies are presented as ways of meeting the aims of both instrumental vocationalism and socio-egalitarian justice. Enterprise education programmes in schools are presented as having many different aims and this has led to difficulties designing evaluation methods and tools (Hytti and Kuopusjärvi, 2004). Researchers have to define the outcomes to be measured before they devise a methodology. The aim of this chapter is to arrive at a consensus about the outcomes of enterprise education which could sensibly be measured. This will then form the basis for the design of the tool.

The UK's Enterprise Strategy highlighted five enablers of enterprise: culture, knowledge and skills, finance, innovation and the regulatory framework. To

promote an enterprise culture the Strategy details the further development of enterprise education in secondary schools, and its extension to primary and further education underpinned by an extra £210m in government funding. The particular problem addressed, by the thesis, is how to measure the impact participation in an enterprise education programme has on young people's attitudes. The main objective therefore, was to design a research tool and to test a methodology capable of measuring changes in attitudes over time.

This chapter places the aims and objectives of the study into recent and current education policy contexts. The argument I present is that the current education and enterprise strategies have their roots in both a vocational instrumentalist approach to education, and a socio-egalitarian approach. Historically, the former approach is most readily identified with the Conservative government (1979 -1997), while the latter is more closely related to traditional Labour values, as exemplified by the comprehensive schooling system (1965). In fact, both sets of aims have traditionally been incorporated into education policy, but the emphasis of one set of aims over another can differ (Jones 2003).

The two main sections of the chapter are devoted to a critique of first vocational instrumentalism, and second socio-egalitarianism. The aim is to identify how these influenced enterprise education policy under New Labour, which, it is argued, is a combination of both these approaches. First, the current education and enterprise policy imperatives are outlined to demonstrate the importance accorded to enterprise education by the previous government, and hence the need for accurate objective research methods to evaluate the impact of these programmes.

2.2 Enterprise Education in Context

There were three key drivers to previous Labour Government policy on education and skills in the UK (14-19 Education and Skills White Paper). The first is the *critical role of skills* for both economic success and social justice,

and the need for skill levels to be raised if the UK is to compete successfully in the global economy (HM Treasury 2004; Leitch 2006). The second driver is the belief that every child has a contribution to make and therefore there is a need to nurture individual talent (DfES 2004; 2003). The third and final driver is the need to increase social mobility by providing support for the vulnerable and disadvantaged (HM Treasury 2004).

The emphasis on the critical role of *world class* skills, is based on the findings of the Leitch review of skills (HM Treasury 2004). The report set out the position of the UK in 2005 in comparison to other OECD countries: which is a strong economy and efficient labour market, but poor productivity and relatively low skill levels. According to Leitch (2006), addressing these low skill rates is crucial to the UK's future economic performance:

> "...where skills were once a key driver of prosperity and fairness, they are now the key driver. Achieving world class skills is the key to achieving economic success and social justice in the new global economy (Leitch 2006:32).

The second key driver behind the previous government's education policy stems from the Children's Bill (2004), which set out a vision to guide policy on education, youth policies, children and families. To realise this vision the guidelines stipulate partnership and collaboration, and the personalisation and integration of services, along with the performance management of agencies and providers. The goal of this vision, enshrined in the Children's Bill, is that *"every child has a potential – a gift or a talent, and a contribution to make".* This vision has practical outcomes given that many of the stated outcomes were translated into Public Service Agreements (PSAs 2007[2]) targets and indicators.

[2] www.cabinetoffice.gov.uk

PSAs provide the framework for all policy development and funding, dictating the priorities for each government department. The key PSAs that relate to enterprise education include:

> PSA1 Raise the productivity of the UK economy.
> PSA2 Improve the skills of the population, on the way to ensuring a world-class skills base by 2020.
> PSA7 Improve the economic performance of all English regions and reduce the gap in economic growth rates between regions.

The final theme underpinning the last government's education policy was the need to increase social mobility. Statistics show that social mobility in the UK has decreased over recent years and the gap between rich and poor is increasing (Booke, 2008). Despite the overall increases in positive indicators such as overall attainment in GCSE results, there is a cohort of underachievers and inter-generational poverty and unemployment. The last Labour government's Enterprise Strategy (HM Treasury, BERR 2008) aimed to contribute to addressing this theme by supporting the wider government PSA goal of meeting the needs of disadvantaged groups (PSA15) as well as addressing the main enterprise PSAs. For instance, the Local Enterprise Growth Initiatives (LEGI) introduced in 2006 was aimed at regenerating disadvantaged neighbourhoods through the promotion of enterprise. By promoting enterprise the aim was to encourage small business start-ups, and social enterprises which could meet the needs of local people.

An over-arching principle for all these drivers of education policy is a two-fold conceptualisation of the purpose of education. On the one hand there is economic prosperity at a national level of society in a global world, and on the other the fulfilment of individual potential. This rationale was described by the then Prime Minister Gordon Brown:

> *"Education is not just a noble ideal, respecting the search for knowledge, the pursuit of wisdom and the fulfilment of human*

potential; it is also I think as everybody knows and economic imperative too." (Brown 2007[3]).

This two-fold purpose of education is an approach to education that appears to encompass previous historically dichotomous conceptualisations of the role of education in society, (Kelly 2004; Halsey *et al.* 1997). An overview of this debate on the role of education will help put the discussion of enterprise education into context. These debates were often characterised by a polarisation of ideological and political beliefs about the role of education in society. Simplistically, traditional sociological perspectives on education were divided into the functionalist approach and the social-egalitarian approach. Functionalist approaches (e.g. Parsons 1951) explain education in terms of maintaining the existing social system, by preparing young people for their economic roles in an industrialised society. This view emphasises a utilitarian, vocational and objectives driven approach to education (Halsey 1997). An alternative view is the socio-egalitarian approach (e.g. Dewey 1916) where the emphasis is on the role of education in tackling social and economic inequalities. These approaches of vocational instrumentalism and socio-egalitarianism have implications for the delivery of, and the content of, the curriculum.

A functionalist approach demands a content driven curriculum designed to meet stated, economic and commercial objectives. A major criticism of this approach is the simplistic input-output view of education, which ignores the processes involved in the interaction between the child and others, including teachers, parents and other pupils (Kelly 2004: Ball *et al.* 1999; Ball 1984). The educational and social processes involved, it is argued, change the nature of the "input" and so influence the nature of the "output": thus "carpentry becomes woodwork" (Bernstein and MacRae 1973:254).

[3] Speech on education by Gordon Brown at University of Greenwich, 31 October 2007

On the other hand, the socio-egalitarian approach led to comprehensive schooling, and mixed ability teaching, with the aim of creating a fairer and more equal society. During the 1970s, Her Majesty's Inspectorate (HMI)[4], which at the time was representative of teachers' professional views, stated *"we have to ensure that the curriculum does everything possible to help pupils to develop as individuals"* and reflected a socio-egalitarian approach (HMI 1977). The recommended curriculum to meet such aims, was framed in terms of competencies in key areas, including: aesthetic/creative, ethical, linguistic, mathematical, physical, scientific, social/political, and spiritual, similar to Bernstein's (1996) competency based model of education, (HMI 1977).

During the 1980s, however, there was a return to the purely functionalist approach in the *Framework for the School Curriculum* (DES 1980), which presented an instrumental, performance based approach to the curriculum, by listing essential subjects and their, purely functional, merits (Kelly 2004). Now, moving forward to the new millennium, the UK PM Gordon Brown (2007) appears to endorse the outcomes of both the socio-egalitarian approach (*"the fulfilment of human potential"*) and the functionalist approach (*the economic imperative"*) in his recent speech on education (2007). This modern approach also reflects the goals of 'social justice' and 'economic success', identified by Leitch (2006) which can be met by an investment in skills. As well as academic achievement Leitch advocates that students possess a range of competencies, such as self-reliance, problem solving, required by employers.

It is the argument in this thesis that in fact the previous Labour government's policy focus on enterprise education can be viewed as both vocational instrumentalism, the aims of which are to meet the needs of national economic prosperity to compete in a global economy, and as a socio-egalitarian competency based approach focused on the needs of the individual young person. The UK's Enterprise Strategy promoted self-

[4] HMI was replaced in 1992 by Osted, the body that inspects schools' and teachers' performance.

employment and the development of businesses, whereas, on the other hand, enterprise education guidelines (Ofsted 2005) focused on individual enterprise (personal fulfilment) in personal and collective (social) activities.

In recent decades the need for *individual* accountability and achievement as an antidote to a dependency culture has been promoted by government policy through welfare reforms, and in schools by educational reforms (Fergusson, 2002; Theodore and Peck, 2001; Furlong and Cartmel, 1997). Between 1980 and the 1990s, under a Conservative government, there was a withdrawal of state welfare support for young adults (Roberts 1995), whereas, under the New Labour government welfare support is being replaced by workfare policies modelled on those in the US (Fergusson 2002). The 'New Deal' was presented as the flagship of New Labour's 'welfare to work' policy. The New Deal was targeted at people not in work and in receipt of benefits (the unemployed, disabled and single parents). It offered claimants a job placement with a private company or voluntary organisation, a place on an environmental task force, or a training or educational course. Refusal to accept a placement could have meant loss of benefit. Organisations such as Tesco, Ford and GEC ran New Deal placement schemes. There was also a self-employment option to New Deal, whereby claimants received a Self-Employed Credit for 16 weeks while they were setting up their business. New Deal grew out of the Job Seekers Allowance where jobseekers received an individual jobseekers contract.

Under these schemes personal qualities of 'self-reliance' and 'enterprise' were encouraged. Alongside these welfare reforms the government's Enterprise Strategy (HM Treasury, BERR 2008) outlined a vision for enterprise in the UK with a focus on both individual competencies and society-wide policies including a range of enterprise initiatives in the education sector. The main focus of the Strategy though, was on promoting 'entrepreneurship' rather than on general 'enterprise skills'. The Strategy detailed how the government "*will make the UK the most enterprising economy in the world and the best place to start and grow a business.*" (HM Treasury, BERR 2008:9). This is in contrast to enterprise education policy which aims to foster enterprise skills in

young people. Whereas economic policy is driven by a narrow definition of enterprise (i.e. entrepreneurship), education policy is driven by the broader definition of enterprise which aims to create an enterprising society and enterprising individuals. This multiplicity of aims at the level of government policy, is one of the reasons why the outcomes of enterprise education programmes are often unclear. At the level of enterprising skills required by employers enterprise education continues the tradition of instrumental vocationalism.

2.3 Enterprise Education as Instrumental Vocationalism

The New Vocationalism is the term given to a range of education and training policies which emerged in the 1970s and 1980s. Its origins are often traced to James Callaghan's Ruskin speech in 1976, though in fact policy interest in vocationalism has historically often been correlated with periods of economic difficulty (Yeomans 1998). During the 1970s an 1980s rising youth unemployment lead to a concern that many school leavers were unable to gain employment due to a lack of qualifications. This led to a raft of government initiatives, including new qualifications and new training courses, all aimed at providing non-academic school-leavers with vocational qualifications or training. These courses included the Technical and Vocational Education Initiative (TVEI) introduced in 1983, the Youth Training Scheme (YTS), which evolved into Youth Training, and then the Certificate in Pre-Vocational Education (CPVE) in 1986. Halsey *et al.* (1997) have identified over half a dozen different youth schemes during this period; all responses to the perceived problems of policy and curriculum development in meeting the needs of the economy and employers. According to Yeomans (1998) and Halsey *et al.* (1997) there was an economic and instrumental discourse at the time, (and still prevalent today) that if only education policy and the curriculum (the input) could be put right then school leavers (the output) would meet the needs of employers and economic growth. The bald simplicity of this view was illuminated by Bernstein's comment that in fact "carpentry becomes woodwork" (Bernstein and MacRae 1973:254).

The names of government departments tend to indicate their brief and during the 1990s some important changes were made that reflected a new focus on education as a vehicle to provide employers with the skills needed to operate competitive organisations. The first indication of the changes to come were vocational courses such as Youth Training Scheme, which at first was funded by the Department of Employment (through the Manpower Services Commission in 1983). In 1997, government re-organisation the link between education and employment by combining the education and employment departments, forming the DfEE (Department of Education and Employment). This department has since been renamed the Department for Education and Skills, thus locating the focus, and responsibility for employment, at the individual level. This department was recently transformed into the Department for Innovation, Universities and Skills in 2008. This has since been changed again, under the Conservative-Liberal Democrat coalition government, to the Department of Business Innovation and Skills, thus emphasising the link between the needs of business and skills.

These vocationalist policies and reforms, which are essentially supply-side solutions, have been criticised for this focus on the individual at the expense of demand-side explanations underpinned by a structural perspective (Finn 2000; Cohen 1998). According to this view unemployment has been problematised at an individual level: certain individuals lack qualifications and training and therefore, it is argued, they do not meet employers' needs, nor do they have the skills for self-employment. An alternative explanation lies in a critique of the widespread structural unemployment during this period (Finn 2000; Cohen 1998). Wider economic factors such as deepening recession and the collapse of traditional youth labour markets, in manufacturing industries and heavy industries such as coal mining and steel production, have led many to question the relevance of such supply side solutions to what are in fact demand side problems (Peck and Theodore 2001; Hayward and Fernandez 2004). Today there is a focus on skills needed for the knowledge economy and Leitch (2006) recommends a similar supply- side solution. It could be argued that supply side solutions are an inevitable consequence of a

functionalist approach to education and training, which seeks to "fit" the individual to society, without taking into account wider societal influences, over which the individual may have little control. This functionalist approach was reflected not just in vocationalist policies, but also in educational reform.

A series of conservative critiques of the education system in the 1970s argued that the abandonment of selective education had been damaging and that new teaching methods (in comprehensive schools) had failed (Brown and Madge 1983). The rise of vocationalist policies was accompanied therefore, by radical change to the education system in the form of the 1988 Education Reform Act (ERA) and the National Curriculum (Kelly 2004). The Conservative Government of the 1980s and 1990s brought in these reforms along with national assessments, so moving the control from schools to central government. For the first time ever, English and Welsh schools had a national curriculum and national testing imposed by the government. Much of the national curriculum and the national tests were based on targets and were largely content driven, with government dictating the content of each subject.

When New Labour took over government in 1997, the focus on vocationalism (and 'enterprise') was retained, but there was also a move to accommodate the more traditional labour values of social egalitarianism, with a focus on equal opportunities for all (Hyland 1999). The following section looks at a socio-egalitarian approach to education and at how enterprise education was used to support the New Labour government's goal of achieving social parity via the education system.

2.4 A Socio-egalitarian approach to Education

The 1944 Education Act, introduced by the Conservative government, had created a system of free, compulsory education for all up to the age of 15. This tri-partite system, which consisted of grammar, technical and secondary schools, was criticised however for perpetuating class inequalities in the education system by forcing pupils into specialist academic or vocational routes at an early age. In 1965, therefore, the Labour government required all Local Education Authorities to make plans to scrap the tripartite system and to

create comprehensive schools which would take pupils of all abilities. The aim of comprehensive schooling was to reduce inequalities of educational opportunity and outcome. How successful comprehensives were is widely debated, since streaming and setting continued in comprehensive schools and residential segregation, and the persistence of selection by some schools, led to reinforcement of class differences (Halsey 1997). A key feature of the comprehensive system was the centrality of 'competencies' in key areas, including: aesthetic/creative, ethical, linguistic, mathematical, physical, scientific, social/political, and spiritual (HMI 1977), over subject matter, following Bernstein's recommendations (Kelly 2004). This can be contrasted to the content-driven curriculum associated with vocational instrumentalism. The role of competencies is also a central component of the aims of enterprise education.

The promotion of enterprise education as a solution to meeting the challenges of a global economy is not confined to the UK. Indeed, "Encouraging the enterprise spirit is a key to creating jobs and improving competitiveness and economic growth throughout Europe" (European Commission 2002:9). The role of competencies is key to this promotion of an enterprise culture, which aims to benefit everyone:

> "However, entrepreneurship should not be considered just as a means for creating new businesses, but as a general attitude that can be usefully applied by everyone in everyday life and in all working activities." (European Commission 2002:10)
>
> "The educational system traditionally teaches young people to reproduce facts and to look for work as an employee. Entrepreneurs, in contrast, need an education which gives them attitudes and skills such as self-motivation, creativity, opportunity seeking, and the ability to cope with uncertainty." (European Communities 1999:7)

At secondary level developing enterprising skills in young people has been recognised as a key component of the competitiveness of the UK (Ofsted, 2005) not only at education policy level, but also within industry (Leitch, 2006; Green and O'Leary, 2007). However, a recent OECD report found evidence of the continuation of low skill levels in the UK and the impact this has on the OECD goal of raising skills to ensure "children will succeed in an increasingly

globalised economy" (Brook 2008:5). Once again this emphasises the links between competitiveness at the level of the economy, and the skills and competencies available at an individual level.

The previous government's Enterprise Strategy aimed to embed an enterprise culture in the UK to overcome, what it perceived to be an entrenched cultural fear of failure (HM Treasury, BERR 2008). One of the objectives of the strategy was to increase enterprise activity in young people, by equipping them with the necessary capability and skills to start their own businesses. According to the strategy over 90 *per cent* of secondary schools now provide enterprise education for all pupils at Key Stage 4 (11-14 year olds) and the proportion of 16-24 year olds considering becoming an entrepreneur has increased from 14.4 *per cent* in 2003 to 17.5 *per cent* in 2007 HM Treasury, BERR 2008:34).

Further initiatives focused on school pupils include the launch of the Schools' Enterprise Education Network (S'EEN) managed by the Specialist Schools and Academies Trust and based on 51 expert 'hub' schools embracing all secondary schools in their region. Enterprise Insight is a coalition of employers, education providers and voluntary organisations that aim to promote an enterprise culture in the UK. Part of this initiative is the Make Your Mark campaign which coordinates the annual enterprise week in schools. 'Make Your Mark' clubs have been established in 70 secondary schools, where student-led groups run live enterprise projects and provide a peer network for 14-19 year olds. The clubs are also being piloted in 30 FE colleges.

Part of the last government's response to the perceived need to develop enterprise competencies in young people was the setting up of the National Enterprise Academy, backed by entrepreneur Peter Jones, which is part of the National Skills Academies programme. The Academy offers a new qualification in enterprise to students over 16 years old, by equipping them with the skills necessary to start a business, skills which, it is claimed, are also needed by employers. The Academy also has a broader remit of raising

awareness across the population and in all age groups, and particularly among women. The first Academy opened in the South East of England, which will be followed by one in the North West and a national roll out of satellite academies is planned for the future. It might be expected that all this investment in enterprise education was based on the finding that previous programmes have had a positive impact on developing competencies, and fostering positive attitudes towards starting a business. However, as the next section demonstrates there is a widespread lack of any such evidence.

2.5 Evaluating Enterprise Education

Enterprise development, including enterprise education, has been a central theme of government policies internationally, since at least the 1980s but the evidence on which these policies are based is often insubstantial, and many policy evaluation studies have been criticised for lacking in methodological rigour (Hytti and Kuopusjärvi, 2004; Storey, 2000). Better research designs, better methodologies with improved research tools could make a significant contribution by providing more reliable evidence on which policy makers and programme providers can base their decisions.

A detailed critique of the common shortcomings of evaluation studies of enterprise programmes, and the ways in which they could be avoided, is provided in Chapter Four. Pittaway's (2005) review of entrepreneurship education in higher education in the UK found that, though significant funds have been devoted, much of this investment is based on limited evidence. Furthermore in-house studies are sometimes more positive in their findings than are independent studies. For instance reviews by the National Council for Graduate Education (NCGE), which was founded in September 2004 with the aim of developing links between industry and HE institutions, to foster improvements in the 'enterprise culture' of universities, concluded that the former DTI's Science Enterprise Programme had made a major contribution towards promoting enterprise education in HEs. Independent research, however, found that the impact of Science Enterprise policy has in fact been

varied and that the content of these programmes was often very different, making comparisons very difficult (Pittaway 2007).

The practical implementation of enterprise education is also problematic, and there is debate about how enterprise education can best be taught. Although the twin aims of education policy: 'economic prosperity' and 'fulfilment of individual potential', appear to unite the historically dichotomous aims of education policy, a dichotomy still exists in the practical implementation of how enterprise education can best be taught. New light can be shed on this debate by introducing the contradiction between existing **subject** based teaching and the **competency** based approach intrinsic to the teaching of enterprise skills, attitudes and competencies. According to Gibb (2000;1993) enterprise skills are not fixed personality traits but can be learned and developed through experience, which is a tacit premise of all experiential learning based enterprise programmes. How 'enterprise' is actually taught often does not necessarily reflect this dynamic model of an entrepreneurial environment (Gibb 2003,1993; Horne 2000).

Instead, many business simulation programmes, such as the Young Enterprise (YE) Company Programme, adopt a corporate model, where students take on one of several roles within a company such as the role of finance director, or marketing executive, production manager and so on. These simulations, it is argued, do not reflect the uncertain, innovative dynamic atmosphere of an entrepreneurial venture, and therefore will fail to develop enterprise competencies in students. Horne (2000) proposed that schools adopt new ways of teaching, by taking an innovative approach to all subject areas to allow enterprise skills to be developed. This approach involves more project work and freedom for students to choose their own topics, materials and so on, in comparison to the traditional approach, where students are guided. For Horne (2000) and Gibb (2000; 1993), the traditional guided approach lacks the element of risk, and stifles creativity. How far can programmes like YE Company Programme, therefore, be expected to change attitudes and develop enterprise competencies? This is one of the questions to which this study hopes to provide some answers. By measuring

participants' attitudes towards enterprise at the beginning of a programme and comparing them to their attitudes at the end of the programme, it would be possible to measure any changes. Of course to isolate the impact of the programme it would also be necessary to use a control group of similar young people who had not taken part in the programme. The research design of such a study would need a tool capable of measuring attitudes towards enterprise, which main objective of this study. The following chapters seek to define the problem, develop a theoretical foundation on which to base the tool, and then finally to document the building of the tool, and its use in an evaluation study.

Obviously, one of the initial problems to be addressed is a clearer definition of the aims and objectives of enterprise education programmes, and specific learning outcomes. Once a clear definition of the desired learning outcomes of these programmes is provided, then this learning outcome can be operationalised. Once operationalised, it is argued, a robust programme evaluation tool to measure the outcomes can be designed and developed. The next chapter, which is the main literature review, looks at a range of competencies, skills and attitudes associated with entrepreneurship and how these might relate to young people aged 16-19. Finally, the concept of 'enterprise potential' is introduced in the framework of an intentions model of entrepreneurship. As the tool will be used to measure attitudes in young people who are unlikely to have started their own business, the problem is to be able to identify those who are most likely to do so in the future. The intentions model of entrepreneurship helps by indentifying the antecedents of business start up or entrepreneurship. One of these antecedents is enterprise potential, and the programme evaluation tool will be designed to measure enterprise potential in young people by measuring their attitudes towards enterprise. Once such a tool has been developed it will enable the design of more robust programme evaluation methodologies.

Chapter Three: Entrepreneurship Literature Review

3.1 Introduction

The aim of this chapter is to locate the research study in the large literature on entrepreneurship research. As the previous chapter provided an educational context for the design and development of the programme evaluation tool, so this chapter will provide a context of entrepreneurship literature.

The previous two chapters outlined the various policy initiatives, both economic and educational, that are focused on the promotion of an enterprise culture. It was noted that there are some confusions that stem from differing definitions of enterprise and entrepreneurship that has an impact on policy aims. While economic policy appears to be advocating initiatives to encourage entrepreneurship and new business formation, education policy advocates promoting a broader notion of enterprise skills and enterprising individuals. It was decided that the application of an evaluation tool to measure attitudes towards enterprise could be used in either context, and the development of the tool needs to take account of both strands of research. To provide a foundation this chapter will focus on the narrow definition of entrepreneurship and investigate the skills, attributes and behaviours that have been identified through research as belonging to the entrepreneur. The wider definition of enterprise skills and enterprising people is also derived from the skills associated with the entrepreneur, and is particularly relevant to the concept of enterprise education in the UK (Gibb 2002; 2000; 1998). Therefore this approach is relevant to the design of an evaluation tool to measure attitudes to enterprise in young people, and will also form an important part of the design.

Chell (2008;1998) has comprehensively mapped the progress of research into the entrepreneurial personality and highlighted the importance of both intentionality and a social cognitive approach to the field. According to Chell (2008) the history of entrepreneurship research can be tracked through several different phases. First there was a focus on a single characteristic

believed to distinguish the entrepreneur such as a high need for achievement (McClelland 1965). Next there were attempts to identify a set of characteristics that together it was felt distinguished the entrepreneur (Rauch and Frese 2007). Finally, social psychology has provided a cognitive theory of entrepreneurship which focuses on the mental processes of the entrepreneur rather than on specific personality traits. This cognitive approach distinguishes entrepreneurship as a process characterised by particular cognitive processes (mental or thought processes) of the entrepreneur. The advantages of conceptualising entrepreneurship as a series of mental processes is that such processes are open to influence, and therefore offers the possibility that aspects of entrepreneurship can be taught. This can be contrasted with a trait theory of entrepreneurship where venture creation springs from the innate personality trait or traits of the individual. The strengths and limitations of trait theories of entrepreneurship are considered alongside psychological personality trait theory such as the 'Big Five' trait theory (McCrae and Costa 1987). The big five refers to five main underlying dimensions of personality which are relatively stable after adolescence, and include characteristics such as introversion/extraversion and neuroticism. It's not clear, however, how helpful such trait theories are to definitions of 'entrepreneurship'. Instead, a social dynamic model of the relationship between underlying personality traits and situations is presented which locates attitudes towards enterprise as being proximal to entrepreneurial behaviour.

Attitudes are also less stable than underlying personality traits and, therefore, are more open to influence, in particular the positive influence which may be exerted by participation in an enterprise programme. Azjen's theory of planned behaviour (1991) forms part of the theoretical framework by placing attitudes in a key role as antecedents to intentions, which in turn are antecedents to entrepreneurial behaviour. An overview of intentional models of entrepreneurship and accompanying research studies provides evidence for the efficacy of this approach. By combining attitude theory and intentions models of the entrepreneurial process the theoretical framework for the present research is developed.

Attitude scales are increasingly being used in entrepreneurship research, often to measure the impact of an enterprise programme (Harris and Gibson 2008; Souitaris 2007; McCLine *et al.* 2000; Robinson *et al* 1991). This is not surprising given the relevance of attitudes to cognitive theories of entrepreneurship. Therefore it was decided that an attitude scale to measure young people's attitudes towards enterprise would provide an effective tool for evaluating enterprise education programmes in schools. However, an investigation of existing attitude scales to measure entrepreneurship revealed the lack of a suitable scale for young people still at school. Instead, based on a review of previous research, the design for an original scale began. The chapter finishes with the selection of dimensions to be included in the programme evaluation tool. The next section is an overview of single trait theories of the entrepreneur, followed by a look at multi-trait approaches.

3.2 Trait Theories of the Entrepreneur

Definitions of the successful entrepreneur have centred either on a specific traits approach or on a collection of behaviours underpinned by certain skills and attributes, which include creativity; autonomy (or personal control), achievement orientation; leadership and, less commonly, coping with uncertainty and ambiguity (for instance Gibb, 2002; 2000; 1987). Chell (2008) has mapped the progress in entrepreneurship research from the specific trait approach, via the broad behavioural approach, to a social cognitive approach.

Chell (2008:88) identifies three models of the single trait approach, "the Big Three", which includes: a need for achievement, locus of control and risk-taking propensity. The single trait model has limited power though, to explain the uniqueness of the entrepreneur. A high need for achievement, for instance, is not solely a characteristic of the entrepreneur, but could equally describe people in many professions and careers (Chell 2089). When one also takes into consideration the impact of culture, it is evident that not all individual traits will work in the same way irrespective of culture. Hofsted

(1984) has shown how national cultures can lead to either a high or a low need for such competitiveness. Achievement motivation presumes a competitive environment in which individuals tend to have high aspirations, but in some local cultures these conditions may not exist. McClelland (1965) hypothesised that countries with a higher mean level of need for achievement would show more entrepreneurial activity than countries with lower levels and he found evidence for this relationship at a country wide level. However this research has been criticised for its focus on a macro level of analysis, there was no attempt to link individual achievement motivation with the propensity to start a business (Brockhaus and Nord 1986). A meta-analysis of the relationship between achievement motivation and entrepreneurial behaviour found support for McClelland's theory (Collins *et al* 2004). However, there were important caveats to this support. Firstly, much of the studies had focused on entrepreneurs and there was little attempt to compare this with the achievement motivation in other occupations, to test whether entrepreneurs did indeed have a greater need for achievement. Secondly, the reliability testing showed that often the measures used were in fact not reliable.

Closely related to the concept of a high need for achievement is the belief in an internal locus of control. Individuals who are reluctant to believe in their ability to control the environment though their actions, would also be expected to be reluctant to assume the risks of starting a business (Chen *et al.* 1998; Mueller and Thomas, 2001).

Rotter (1975; 1954) developed the concept of control as part of a wider social learning theory of personality. Rotter hypothesized that individuals with internal beliefs would more likely strive for achievement than would individuals with external beliefs. Studies by Brockhaus and Nord (1986) found support for the high locus of control beliefs of entrepreneurs compared to managers. Brockhaus and Nord also found that entrepreneurs were more likely to have an internal in locus of control beliefs when compared to managers.

Finally, risk-taking has also been the focus of studies investigating the personality characteristics of entrepreneurs (e.g Simon *et al* 1999). Simon *et*

al (1999) investigated risk perceptions in 191 MBA students in the US, using students' analyses of case study material. They found that students used a range of cognitive bias techniques in attempts to minimize the risks involved. Therefore their inclination was not to take risks, however given these were students the study does not provide a good representation of the behaviour of entrepreneurs. The individual entrepreneur's inclination to take risks has been identified as an influence on risk perception. This inclination is referred to as risk propensity, and research has produced conflicting findings on its relationship with new venture creation. Some studies indicated a negative correlation between risk propensity and venture creation (Sitkin and Weingart 1995), while others found no significant relationship (Forlani and Mullins 2000). Risk propensity has also been presented as a moderating influence on the relationships between inherent risk related venture characteristics and the individual's risk perception (Mullins and Forlani 2005). There is little consensus about the relationship between risk propensity and venture creation. Furthermore the evidence seems to be inconclusive.

3.3 Multi-trait Theories of Entrepreneurship

According to Chell (2008), the simplistic single trait approach has limited value as a theoretical framework to describe the entrepreneur. In comparison to the single trait approach the multi-trait approach is now more prevalent in the literature (e.g. Muller and Gappisch 2005; Carland *et al.* 2001). A multiple-trait model has greater explanatory breadth to describe the unique set of individual characteristics of entrepreneurs. For instance, Muller and Gappisch (2005) developed the Entrepreneurial Potential Questionnaire to measure eleven dimensions: need for achievement; locus of control; problem-solving; risk-taking; manipulation/assertiveness; need for autonomy; level of arousal; stress resistance; emotional stability; intuitive problem-solving. The reliability of some of the scales involved was low, but one of the main criticisms of this work is that it has not been replicated to establish the validity of this approach.

Carland *et al.*'s (2001) study sought to develop a valid instrument to measure entrepreneurship characteristics that could be used to examine the relationship of the entrepreneur to the performance of a business venture. The authors proposed that entrepreneurship is a *gestalt* of four elements: cognition; preference for innovation; risk-taking propensity; and strategic posture (entrepreneurial managerial orientation). They argued that "these elements combine in an individual's psyche to produce a drive to create entrepreneurial ventures" (Carland *et al.,* 2001:58). Follow-up studies would help to confirm the validity of this approach.

Chell (2008) identifies innovative entrepreneurs as the subject of a number of studies. Innovative entrepreneurs are described as having a range of characteristics including creativity, proactiveness, a propensity for risk taking, high-achievement orientation, high energy levels and a need for independence (e.g. Sexton & Bowman-Upton, 1983; Rauch *et al.* 2005). Additional characteristics include self-efficacy, locus of control or personal control, optimism, and alertness (e.g. Hansemark, 2002; Ardichvili et al, 2003). Small business and entrepreneurship research has focused in depth over a long period of time on individual differences research. There have also been some thorough reviews of particular individual difference factors and studies that have moved the field on from an exclusive concentration on trait approaches in the 1980s to more complex models comprising often the measurement of abilities, skills, attitudes, beliefs and/or social norms as well as traits, demographic factors and contextual factors (e.g. Zahra *et al.* 2006).

McCrae and Costa (1987) developed the 'Big Five' personality theory - a broad theory of the structure of personality based on research that identifies just five broad traits: conscientiousness, openness to experience, agreeableness, extraversion, and emotional stability. Ciavarella et al (2004) examined the relationship between entrepreneurial personality (measured using the Big Five) and long term survival of a venture. They had mixed and some unexpected results: consciousness was found to be positively related to

long-term venture survival, but openness was negatively related.[5] No other significant results were found.

Rauch and Frese (2007) propose that broad traits (the 'Big Five') underpin specific entrepreneurial traits, such as need for achievement, risk-taking propensity, innovativeness, autonomy, locus of control & self efficacy. These traits, they argue, directly influence dynamic behaviours such as action strategies when combined with knowledge, skills & abilities and result in business outcomes (success/ business creation). Rauch and Frese (2007) carried out a meta-analysis of previous studies and found that broad traits were significantly related to entrepreneurial success. However, primary evidence to support the model in the form of empirical research studies would provide data to investigate the relationship between the big five personality traits and specific entrepreneurial traits.

3.4 Social Psychology and Cognitive Theories of Entrepreneurship

The two previous sections provided an overview of research into single and multi trait theories of entrepreneurship. The single traits thought to distinguish an entrepreneur were: a high need for achievement; locus of control; and a risk-taking propensity. One of the main problems with this approach is that research on entrepreneurs has found that they display a range of different personality characteristics and it is difficult to identify a single trait that makes the entrepreneur stand out from others. The studies often demonstrated the links between a single trait, say locus of control and other traits such as achievement motivation (Rotter 1975). An alternative approach is the multi-trait approach where a group of specific traits are thought to distinguish the entrepreneur. Some of this work has built on psychological personality theory including the Big Five personality traits (McCrae and Costa 1987). Though several research tools have been developed through the multi-trait research

[5] Participant students were identified in 1973 and tracked. In 1995 those who had started a business (111) were measured using personality tests. However no comparisons were made with students in other occupations.

more often than not the initial studies have not been replicated using different situations and different samples. Such replication would have provided more evidence about the efficacy of the tools, particularly on their reliability and validity. Until such evidence is provided it is difficult to assess the usefulness to future research of these tools. Furthermore, a main weakness of these multi-trait approaches is their reliance on the psychological trait theory of personality. A major problem is that traits are often poor predictors of behaviour, instead they are more commonly used to describe personalities in psychology (Mischel 1973). According to Mischel traits are unable to capture the dynamic nature of personality and therefore unable to predict change or intentions. Personality and how people behave are also shaped by the situations we find ourselves in. Interactionist theories of entrepreneurship attempt to take account of such situational variables.

Interactionist theories of entrepreneurship research identify the importance of context in shaping behaviour, that is, both personality and situation are identified as predictors and shapers of behavioural outcomes (e.g. Crant, 1996; Krueger & Brazeal, 1994). The social personality approach has emerged from social constructivism (Chell 2008; Hampson, 1982), which suggests that behaviour emerges from situations and is defined in context. For instance this approach has been used to explain entrepreneurship and innovation (Jack, *et al.* 2004; Chell *et al,* 1991). Cognitive approaches, on the other hand, emphasise the importance of mental or cognitive aspects, and thought processes of innovative and entrepreneurial people (Mitchell et al, 2007; Gaglio and Katz and Shepherd 2003; Chen et al, 1998). A social cognitive approach takes into account both cognitive and environmental/social factors that interact to influence behaviour. A major influence on this approach is Bandura (1986), who is a key figure in the development of social learning theory and self-efficacy, both of which have recently heavily influenced entrepreneurship research

The focus on 'enterprise potential' gives prominence to cognitive aspects of entrepreneurship such as 'thought processes' and in particular attitudes. Attitudes can be influenced by imitation, social modelling and observation

(Bandura 1986) Attitudes are conceptually very different to personality characteristics or traits that a person is born with, and are developed and changing in response to particular experiences. Attitudes are shaped by social context and have the advantage of being more accessible to research investigation than are underlying personality traits. Attitudes are also proximal to action that is they are closer to actual behaviours than are traits.

Using a social psychology model of the dynamic relationship between underlying personality traits and situations helps to place the role played by attitudes into context (Roberts and Pomerantz 2004). The Roberts and Pomerantz model (2004) which describes the different "person by situation" levels of interaction, from narrow to broad levels, has been adapted to explain the "entrepreneur by situation" interaction levels of research (Table 3.1).

Table 3.1 Entrepreneur-by-situation interaction model

Situation Level	***Person Level***		
	Narrow ***A***	*Medium* ***B***	***Broad*** **C**
Narrow **D**	*Proximal situation*	***thoughts, feelings behaviours (attitudes)****	Emotional experience (physical effects e.g. entrepreneurs energy/alertness)	Specific traits (e.g. leadership, creativity)
Medium **E**	*Organisational climate*	A focus on entrepreneurship or small business management.	Emotional dispositions of entrepreneurs (e.g. Shapero 1975).	Typologies of entrepreneurs based on a constellation of traits (e.g. Muller and Grappish 2005)
Broad **F**	*Culture*	GEM international comparative research.	Research on the effect of national culture (Hofstede 2003)	Factor structure of Big Five across cultures (McCrae & Costa 1987)

Adapted from Roberts and Pomeranzt (2004:408) "Person-by-situation interaction model".
*Focus of present research – cell DA.

The model demonstrates levels of dispositions in people from a narrow level which includes attitudes to a broad level of relatively stable personality traits.

The model also depicts the interface of person variables with situations of narrow, medium and broad contexts. At the level of the person, narrow or proximal attributes are the thoughts, feelings, behaviours and attitudes of individuals. At the medium level of the person are there actual emotional experiences and their physical effects. These include the energy of the entrepreneur, and their alertness to opportunities including their propensity to act. Finally, at the broad level of the person are the underlying personality traits such as the Big Five personality traits, which are relatively static and poor predictors of actual behaviour. Elements at the narrow level of the person including attitudes, thoughts, feelings are better predictors of actual behaviour, because they are close to the external situations.

The three situation levels are narrow or the proximal situation; a medium level situation which may be the organisational climate an individual finds themselves in; and finally a broad level which could be characterised by a national culture. So an investigation at the medium situation level of a narrow focus at the individual person level could include a focus on small business management techniques. Whereas a study at the broad situation level is one such as the GEM study which looks at differences in total entrepreneurial activity at a country wide level. At this broad level studies reflect the culture at a national level.

The focus of this research is at the interface of the narrow person level with the narrow situation level: thoughts, feelings and behavioural aspects of attitudes. Intentional models of entrepreneurship place attitudes towards enterprise at this level, as certain attitudes are necessary predispositions for entrepreneurial behaviour. When and if the proximal situation variables are favourable to venture creation, then a person with certain attitudes is more likely to start a business than others without such attitudes. Attitude instruments tend to account for more of the variance in a particular set of behaviours than do personality dispositions or trait based instruments (Azjen 1991). One of the methodological advantages of an attitude model over a personality trait model is that it can be more domain specific thereby reducing the unexplained variability and increasing the correlation with behaviour (Azjen 1991).

The focus of this research, therefore, is on entrepreneurial cognition, or the mental processes of the entrepreneur rather than a particular set of personality traits. What is to be measured is young people's attitudes towards enterprising behaviour, but this begs the question, "what is enterprising behaviour", and more importantly what are its antecedents? Lessons learned from the recent burgeoning of research on entrepreneurial cognition can help to answer this question.

The field of entrepreneurial cognition is a developing research stream that provides a critical perspective for understanding entrepreneurship (Mitchell et al. 2007). In this case 'cognition' refers to the mental or thought processes of the entrepreneur. This represents a move away from a focus on relatively stable personality traits (exemplified in column C in Table 3.1), to a focus on proximal situations at the narrow person level (cell DA in Table 3.1). In framing research questions, the focus is not on the 'creativity' or the 'leadership' of an entrepreneur but rather how these are perceived: the perceptions and attitudes are the key components. How attitudes and perceptions affect intentions (e.g. to start a business) has been explored by researchers using Azjen's theory of planned behaviour (1991).

3.5 Intentions Models of Entrepreneurship

According to Azjen's theory of planned behaviour attitudes towards a given behaviour influence an individual's intentions. Entrepreneurship is an intentional process (i.e. mental processes are key, not traits), and intentionality has been shown to be central to entrepreneurship (Bird 1988, Katz and Shepherd 2003). Azjen (1991) has shown that intentions can be used to predict and explain future behaviour, and that in turn attitudes will affect intentions. For instance path analysis found that perceptions and positive attitudes towards entrepreneurship proved to be significant antecedents to entrepreneurial intentions using a cohort of 126 business students (Krueger and Carsud 1993). Krueger and Carsud (1993) argued that attitudes influence behaviour via intentions and, as such, both are antecedents to entrepreneurial behaviour. A focus on intentions can therefore

provide critical insights into behavioural processes (Azjen 1991). Intentions models offer a coherent robust framework for understanding entrepreneurial processes. According to Shapero's (1982) intentions-based model: the intention to start a business derives from perceptions of both desirability and feasibility (of starting a business) and from a propensity to act upon opportunities.

There is a growing body of empirical support for this intentions model of entrepreneurship (Mitchell *et al* 2007; Krueger and Kickul 2006; Krueger and Carsud 1993;). For instance, Krueger and Kickul (2006) used 528 university students enrolled in entrepreneurship programmes in Finland, Norway and Russia to test the relationship between different cognitive styles and intentions to start a business. Cognitive styles were categorised as 'intuitive' and 'analytic', and through structural equation modelling, national culture and gender were factored into models of pathways between cognitive styles and intentions. The study found that different cognitive styles can lead to different pathways to entrepreneurial intentions. National culture, via social norms, was significant for 'intuitive' cognitive styles but not 'analytic, whereas gender was related to measures of self-efficacy: overall, women scored lower on entrepreneurial self-efficacy than men. However, the sample was too small to carry out gender analysis at the level of country. There was also no attempt to account for different national characteristics as recommended by Hofstede (2003). If a country level gender analysis had been carried along with an analysis of national characteristics then this would have provided a deeper level of analysis to this study. Nevertheless, the study did provide further evidence of the significance of intentions when evaluating enterprise education programmes.

The intentional process of entrepreneurship can also be understood through using samples of subjects currently facing career choices (Krueger and Carsud 1993). Krueger and Carsud (1983) tested Shapero's model by examining the direct effect of feasibility and desirability perceptions and propensity to act. Prior entrepreneurial experience (e.g. a family business) was found to be closely correlated with entrepreneurial intentions.

Furthermore, perceptions of feasibility and desirability were correlated with levels of 'positive' prior entrepreneurial experiences. In other words, when the latter were high, so were the former. Links between prior exposure to entrepreneurial activity in the form of role models (i.e. family members involved in business), and entrepreneurial intentions have been investigated in several studies. However, although many entrepreneurs do have parents who have owned a business, some research has found that entrepreneurs' children are not any more likely than average to start their own business (Brockhaus 2004). Instead, it is argued that multiple role models and exposure to family business, influence **intentions** indirectly via **attitudes** towards entrepreneurship (Scott and Twomey 1988; Krueger and Carsud 1993). This conclusion supports the model being developed here, that positive attitudes are important antecedents to intentions to start a business, and can thus provide an insight into enterprise potential. If this is the case, then, if these attitudes could be measured, this would provide a foundation for a research tool.

According to Krueger and Brazeal (1994) potential entrepreneurs need not have any salient intentions toward starting a business: their potential is latent and is causally and temporally prior to intentions. In this respect the concept of prior enterprise potential is very relevant. One of the problems with evaluations of enterprise programmes has been the issue of what exactly is being measured. Longitudinal research could track participants and use a measure of occupation choice including venture creation to evaluate the impact of programmes. Realistically the funding is rarely available for such longitudinal research, despite the need for it. Instead policy makers and providers require more immediate feedback on the efficacy of enterprise education programmes. A reasonable compromise would be to measure an operationalised concept of enterprise potential based on the models outlined above, to evaluate programmes. Using before and after testing this approach could identify the impact participation on a programme has had on participants, compared to a control group who did not take part.

Using Shapero's (1985) displacement model of the 'entrepreneurial event', Krueger and Brazeal (1994) distinguished between the latent entrepreneurial 'potential' of individuals from the 'intention' to become entrepreneurial, which is a reaction to a displacement event (something which occurs to cause a change in behaviour). In this context 'entrepreneurial potential' comprises: perceived desirability (including social norms and attitudes) perceived feasibility (self-efficacy), and a propensity to act (perceived personal control over situations). Peterman and Kennedy (2003) used Shapero's model, in a similar way, to measure the impact of participating in an enterprise programme on pupils' attitudes to business start-up. According to the model attitudes are influenced by: perceived desirability; perceived feasibility and the propensity to act. The sample was drawn from 17 secondary schools in Queensland Australia where the Junior Achievement programme was run. A total of 117 participants took part along with 119 pupils at the same schools who were not taking part. Using a pre-test and post-test control group design, the researchers concluded that the entrepreneurial experience had a positive impact on pupils who recorded significant changes in their perceptions towards starting a business after taking part. The Peterman and Kennedy study confirms that a pre and post test design using a control group can help to distinguish the impact of participating in an enterprise programme on young people. As its basis the study used a prior experience of enterprise (e.g working in a relative's business), perceptions of enterprise skills, and a measure of desire to run a business. One problem with this approach is the dependence on the self reported intentions to run a business as a measure. Instead a more objective measure would be changes in the enterprise potential of young people. If enterprise potential can be measured using an objective tool such as an attitudes test, then impact studies would not be reliant on self-reported intentions, which are likely to be more fallible.

Developing an evaluation tool to measure 'enterprise potential' in young people, however, requires a clear conceptual framework that is relevant to young people, as well as the field of entrepreneurship theory, and the requirements of a broader concept of enterprise skills and enterprising individuals. The next sections will therefore review attitude theory, and the

selection of key dimensions necessary for inclusion in a conceptual framework to underpin the programme evaluation tool.

3.6 Attitude Theory and the Entrepreneurial Process

Attitudes have been identified as key antecedents to behaviour (Azjen 1991). In the context of entrepreneurial behaviour attitudes have also been identified as key antecedents contributing to enterprise potential (Krueger and Brazeal 1994). Therefore the relevance and use of attitude theory in evaluations of enterprise education will be reviewed in this section. This research draws on an attitudinal theory of enterprise based on a tri-partite model of attitudes (Robinson *et al.* 1991). An attitude is a psychological tendency that is expressed by evaluating a particular object either favourably or unfavourably (Eagly and Chaiken 1993). The object in question can be concrete (a physical object or event) or an abstract entity (e.g. the concept 'freedom'). Manifestations of an attitude are divided into three parts in the model: 'cognitive', 'affective', and 'behavioural' (Ostrom 1969; Rosenberg and Hovland 1960). The cognitive component consists of beliefs about the attitude object; the affective component includes emotions and feelings towards the object; and the behavioural component consists of actions directed at the object as well as behavioural intentions.

Though proven to be effective in a number of studies, the Robinson *et al.* (1991) Entrepreneurial Attitude Orientation scale (EAO) is limited in scope to business situations and is therefore unsuitable for young people, still at school[6]. The EAO has been used to measure attitudes to enterprise in a number of studies in different fields including the health care industry (McCline *et al.* 2000). Attitude scales tend to have greater reliability than personality scales and as they also need to be domain specific they can be adapted to a variety of different situations (Azjen 1991). Therefore it was decided to use an attitude scale to measure enterprise potential in young

[6] Chapter Four contains details and critique of studies using the Entrepreneurial Attitude Orientation scale.

people in secondary schools. An attitude scale could be developed using domain specific elements, that is the statements could be written to reflect young people's actual experiences in school.

This study therefore extended the scope of the Robinson *et al.* (1991) research, to the development and validation of an attitude measure, appropriate for young people still at school. Such a measure could provide a means of carrying out evaluations of the increasing number of enterprise education programmes now being run in schools. In this models latent entrepreneurial potential is identified as a key prior condition to entrepreneurship, and it is this predisposition in young people that the evaluation tool is intended to measure.

There is continuing debate about conceptual and operational issues, surrounding the measurement of attitudes. One of the main conceptual problems is that attitudes are one of many determinants of behaviour. A range of situational factors will also influence actual behaviours. Attitudes, therefore, can best be described as *predispositions* towards certain behaviours. To successfully measure attitudes, a high degree of specificity is needed, and statements in a test must be context specific, rather than general statements about feelings towards an object (Ajzen and Fishbein 1980).

3.7 Selection of Dimensions for Enterprising Behaviour

3.7.1 Introduction

The design of the evaluation tool draws on this review of entrepreneurship research, the attitudes to enterprise test (Robinson *et al.* 1991) and enterprise theory (Gibb 2000; 1987). Gibb's enterprise theory distinguishes between enterprising 'behaviours' 'skills' and 'attributes'. Definitions of the successful entrepreneur often centre on a collection of behaviours underpinned by certain skills and attributes, which include creativity; autonomy (or personal control), achievement orientation; leadership and, less commonly, coping with uncertainty and ambiguity (for instance Gibb, 2002; 2000; 1993; 1987).

Therefore, entrepreneurial 'potential' was conceptualised in this study as a multidimensional construct. The Entrepreneurial Attitude Orientation Scale (EAO) used four dimensions: achievement; self-esteem; personal control and innovation (Robinson *et al.* 1991). A further study of young people in the UK measured three dimensions: 'hard work', 'internal locus of control' and 'need for achievement' (Bonnett and Furnham 1991). Since these early studies debate has continued about the nature of the entrepreneurial personality, though a number of key dimensions have remained constant. According to Gibb (2002; 1993), an early proponent of enterprise education, the term 'entrepreneurship education' has commonly been used in the United States, whereas in the United Kingdom the term 'enterprise education' is more likely to be used. For Gibb, enterprise education is a means of developing core enterprising behaviours, attributes and skills in young people. The skills he identifies are problem solving, creativity, and persuasiveness. The personal attributes are self-confidence, dynamic and resourceful, and the behaviours include persuading others, opportunity seeking, and taking risky actions in uncertain environments. The basic essences of small owner managed businesses and self-employment are: a holistic task structure, where the owner manager has to decide everything and make the rules; and a learning environment which is discovery and action oriented (Gibb 2005; 2003; 1993). Recent educational guidelines, on the teaching of enterprise in schools, reflect Gibb's early conceptualisation of enterprise learning as something present throughout the curriculum (Ofsted 2005). Enterprise learning is now an integral part of the Key Stage 4 curriculum (age 14-16), and enterprise education is one of the key curriculum areas set out in the 'Every Child Matters Green Paper Treasury (2003). This review will therefore include both evidence from entrepreneurship research and the key requirements of enterprise education in schools in the UK. The next section is an overview of dimensions in entrepreneurship research and why some may not be appropriate for young people.

3.7.2 Key Entrepreneurship Characteristics.

The five dimensions reported by Caird (1991a:1991b) are among the most commonly cited and studied (Vecchio 2003). Following an early review of the literature Caird (1991) developed the General Enterprise Tendency Test (GET Test), a psychometric instrument designed to measure five key entrepreneurial dimensions: calculated risk-taking; creative tendency; high need for achievement; high need for autonomy; and an internal locus of control (Caird 1991a:1991b). The use of such personality traits as a basis for developing a model of entrepreneurship, however, has suffered from conceptual and methodological problems. As this review has demonstrated personality traits are static and theories based solely on traits are simplistic representations which underestimate cognition and the influence of specific situational factors on actions (Ajzen and Fishbein 1977). Moreover, such studies have demonstrated neither discriminant nor convergent validity[7] (McCline, Bhat and Baj 2000; Robinson, Stimpson, Huefner and Hunt 1991) The concepts of discriminant and convergent validity along with reliability of scales will be considered in detail in Chapter Four on the methodology. Instead of focusing on personality theory, this research built on the Entrepreneurial Attitude Orientation Scale (EAO) (Robinson *et al.* 1991) and subsequent work by McCline *et al.* (2000).

Though risk-taking is a considered to be an important component of entrepreneurship attempts to measure the risk-taking propensity of entrepreneurs have had mixed results. Whereas studies such as Brockhaus (1980) and Peacock (1986) found no differences in risk-taking between successful and unsuccessful entrepreneurs and the general population, Carland, *et al.*(1995) and Stewart and Roth (2001) found that entrepreneurs did show a greater propensity for risk-taking than managers. Adolescent risk-taking is also conceptualised differently in the youth-related sociology literature (e.g. Gullone and Moore 2000). Perceptions of risk-taking in young people are often conceptualised in terms of 'thrill-seeking' or 'anti-social' behaviours and centre around issues such as drug taking and sexual

[7] Validity is a key requirement in the development of scales.

behaviours. Young teenagers are not usually autonomous individuals with control over their own financial responsibilities, and therefore a concept of financial risk-taking is not relevant. The conceptualisation of risk-taking as generally used in entrepreneurship research therefore could not be applied to young people still at school. The decision was made to omit this dimension from the research tool.

Gibb (2000; 1993) has developed key enterprise dimensions that need to be incorporated into enterprise education programmes. It may be remembered that Gibb's recommendations on enterprise education have been largely adopted by government (Ofsted 2005). Therefore on the assumption that the aims of enterprise education programmes will adhere to the guidelines provided by Ofsted the selection of dimensions for the research tool will be guided by Gibb's model of enterprise theory. Gibb identifies five main dimensions as key outcomes of enterprise education: perceptions of creativity; perceived personal control; dynamic/achievement orientated; intuitive; and self-perceptions of ability to lead others.

Therefore the measure was based on these five dimensions. There is some evidence to suggest that self-efficacy may also be an important factor in the choice of self-employment as a career (Chen *et al.* 1998; Krueger and Carsud 1993; Krueger and Bazeal 1994). The concept of self-efficacy comes from social cognitive theory, and states that people who expect to perform well at a task, will do better than people who expect to perform badly (Bandura 1997;1986; Bandura and Schunck 1981). Therefore, an element of self-efficacy was incorporated in the present study. Respondents were asked, for instance, about their perceptions of their ability in each of the five dimensions. The following sections explain each dimension in more detail, and outline how each is conceptualised in this study.

3.7.3 Creativity

The concept of innovation is central to many definitions of 'entrepreneurship' and has been measured in a number of studies (Caird 1991a; Robinson *et al.*

1991; Mueller and Thomas 2000; Gelderen 2000; Louw *et al.* 2003). According to Schumpeter's (1950) often cited dynamic model of 'creative destruction' competition arises through innovation, whereby some companies succeed over others, who lose out. As innovative behaviour arises through personal creativity, 'creativity' is therefore a central dimension of 'enterprising potential' in individuals. The Jackson Personality Inventory Manual (JPI), used in the Mueller and Thomas (2000) international study of enterprising countries, defines innovativeness as a tendency to be creative in thought and action. A high score on the JPI innovativeness scale indicates a preference for novel solutions to problems and an appreciation for original ideas. However entrepreneurship research is one of two sources for the choice of dimensions. Greater scope for creativity in schools is advocated by commentators on enterprise education (Jones and Wright 2007). In response a number of creative partnerships have been set up between creative professionals and schools to encourage greater creativity in pupils (Ofsted 2005). Aspects of creativity include flexibility, coping with the unexpected, finding solutions to seemingly intractable problems by looking at them in a new/quirky way, being able to imagine something out of the ordinary (Jeffrey and Craft 2004). Domains for creativity include problem solving, seeing things in a new/novel way, having insight and confidence in one's own ideas, and having the courage to explore new ideas or conversely disliking change. A creative pupil may like to do things their way, for example, and will prefer teachers who try out different teaching methods (Jeffrey and Craft 2004).

Social personality, social cognitive and related approaches assume that behaviours, attitudes, skills and so forth are learned in the course of social interaction and appropriate social contexts. Social psychological models of creativity, for example, emphasise the importance of context in the development of creative skills and support for their expression (Simonton, 1997) and the importance of intrinsic motivation and a supportive environment (Amabile, 1983). Csikszentmihalyi (1996) suggests that what shapes a person's creative behaviour is the interaction between personality attributes and the domain in which they are working. Further, a person who wishes to introduce novelty into a domain must first of all be dissatisfied with the status

quo; this provides the external impetus, and the intrinsic satisfaction follows from producing a solution to the problem. However novelty cannot be introduced without the acceptance of others (Csikszentmihalyi 2002; 1996). According to (Csikszentmihalyi 2002) the innovator needs to understand the social rules of the particular cultural context (e.g. technical procedures, types of knowledge, belief systems and styles of art or design) and be able to influence key people to adopt the changes suggested by the innovator. Aspects of creativity include flexibility, coping with the unexpected, finding solutions to seemingly intractable problems by looking at them in a new/quirky way, being able to imagine something out of the ordinary. Domains for creativity include problem solving, seeing things in a new/novel way, having insight and confidence in one's own ideas, and having the courage to explore new ideas or conversely disliking change. A creative pupil may like to do things their way, for example, and will prefer teachers who try out different teaching methods (Jeffrey and Craft 2004).

3.7.4 Personal Control

A strong belief in personal control can be viewed as a prerequisite for action, and Shapero (1985) and Krueger and Carsud (1993) propose that 'propensity to act' is an essential disposition for new venture creation. Bonnett and Furnham (1991) found that young people on an enterprise programme had a greater degree of personal control than non-participants, and Hansemark (1998) discovered that participation in an enterprise programme significantly increased the perception of control in students compared to a control group.

Previous research has found a significant relationship between the Protestant Work Ethic and an internal locus of control (Furnham 1987), where 'locus of control' is the extent to which a person believes they have control over their life, as defined in the extensive work by Rotter (1954; 1975). Though, some of the studies in the field of entrepreneurship have been equivocal about the role of 'locus of control' (e.g. Brockhaus and Nord 1986). A more accurate conceptualisation is personal control as used by Robinson *et al.* (1991).

'Locus of control' refers to a stable personality trait which is difficult to measure (Krueger and Carsud 1993), however a concept of personal control refers more to attitudes towards taking control (Robinson *et al.* 1991).

Personal control has been linked to self-esteem, particularly in young people (Stipeck and Nord 1981), so statements could relate to positive attitudes about oneself, being satisfied with who you are/wanting to be different, having respect for oneself – or not, or feelings of self-worth, pride and ability to carry out desires, and control over future career. Rosenberg's scale for self-esteem in young people relates to some of these ideas and includes: positive attitudes about oneself, being satisfied with who you are/wanting to be different, having respect for oneself – or not (Rosenberg 1979). Furthermore, self-efficacy involves a sense of personal control not only in the general sense of 'over one's destiny', but also of the ownership of ideas that the entrepreneur is set to take forward.

3.7.5 Dynamic/Achievement orientated

A high need for achievement was identified by McClelland (1965) as an intrinsic characteristic of an entrepreneur, and his research has established its links with economic development at the level of countries. The link between entrepreneurs and achievement motivation has been confirmed by subsequent studies (Morris and Fargher 1974; Durand and Shea 1974; Caird 1991a; Robinson *et al.* 1991). Need for achievement has also been conceptualised and measured in a study which looked at the 'goal-setting' 'perseverance', 'drive' and 'energy levels' of undergraduates, which found that students with intentions to start a business had higher levels of achievement (Louw *et al.* 2003). In developing a domain of enterprising behaviours of ordinary people Gelderen (2000) included 'being active', 'busy,' and 'initiative'. Moreover, participants in an enterprise programme for young people had higher levels of achievement orientation than non-participants (Hansemark 1998). Young people on a Young Enterprise (YE) programme were also

found to hold stronger beliefs in 'hard work' than non-participants (Bonnett and Furnham 1991).

According to Gibb (2000;1993) people with a need for high achievement have high energy levels and are likely to have high motivation, and the ability to carry on with tasks in the face of set backs. High energy may also be related to an outgoing personality, a gregarious nature. The opposite of this is maybe someone who perceives themselves to be sensitive, caring, and patient. Domains for achievement include: someone who has a wide circle of friends rather than 'intimate/best' friends, and enjoys project work and does a lot of the work on behalf of the rest of the group, and believes in finishing work to the best of their ability (Louw *et al.* 2003). .

3.7.6 Intuition

Intuition has only recently begun to be investigated as a possible characteristic of the entrepreneur (Allison *et al.* 2000). 'Intuition' is a dimension that can be associated with the ability to cope with uncertainty and unstable circumstances, which are often associated with enterprise creation (Gibb 1987). Gibb (1993) and Horne (2001) recommend that an element of uncertainty should be introduced in the classroom during the teaching of enterprise skills, to enable pupils to experience the need to make choices even when they lack all the necessary information. Intuition has been recognised as an advantage to entrepreneurs and is related to opportunity recognition. Entrepreneurs can exploit opportunities others may miss because their cognitive abilities enable them to operate effectively even when faced with ambiguity and uncertain environments (Krueger and Brazeal 1994; Alvarez and Barney 2002).

Cognitive style is defined s a person's preferred way of gathering, processing and evaluating information. It influences how people scan their environment for information and how they organise and interpret this information and how they integrate these interpretations into their mental models and subjective

perceptions that ultimately guide their actions (Allison and Hayes 1996). Although there is debate over the complex nature of cognitive styles most commentators agree that these disagreements are merely different interpretations of the dimension of cognition spanning a spectrum from analytic to intuitive (Allison and Hayes 1996). Allison et al., (2000) used the Cognitive Style Index (CSI) in a study of 250 entrepreneurs and managers and found that successful entrepreneurs were more intuitive in their cognitive style than managers.

Finally, for Gibb (2000;1993), coping with uncertainty; taking actions in uncertain circumstances all point to the ability to act intuitively even when all the facts are unknown. This underlines the importance of intuition in entrepreneurial activity and in particular intuitive approaches to information processing.

3.7.7 Leadership

Vecchio (2003) identifies 'leadership' as an important factor in entrepreneurship, but notes that it has received more attention so far within the general field of management. In a review of studies on entrepreneurial traits Vecchio (2003) argues that 'entrepreneurship' can be viewed as a type of leadership, which occurs in a specific setting (i.e. a small business). This argument makes 'leadership' a central dimension in the process of 'entrepreneurship'. However, given the difficulties and unreliability of measuring actual traits (Azjen 1991), the intention of this research is to measure attitudes towards traits associated with entrepreneurship.

According to Covin and Slevin (2002) effective entrepreneurial leaders encourage a culture where resources are managed strategically and opportunities are exploited. Rather than a personality trait, what is key is attitudes towards leadership and the perceptions of entrepreneurs (Gibb 2000). Gibb (1993) identifies as enterprising, behaviours which seek to 'persuade others' using skills and attributes such as 'persuasiveness',

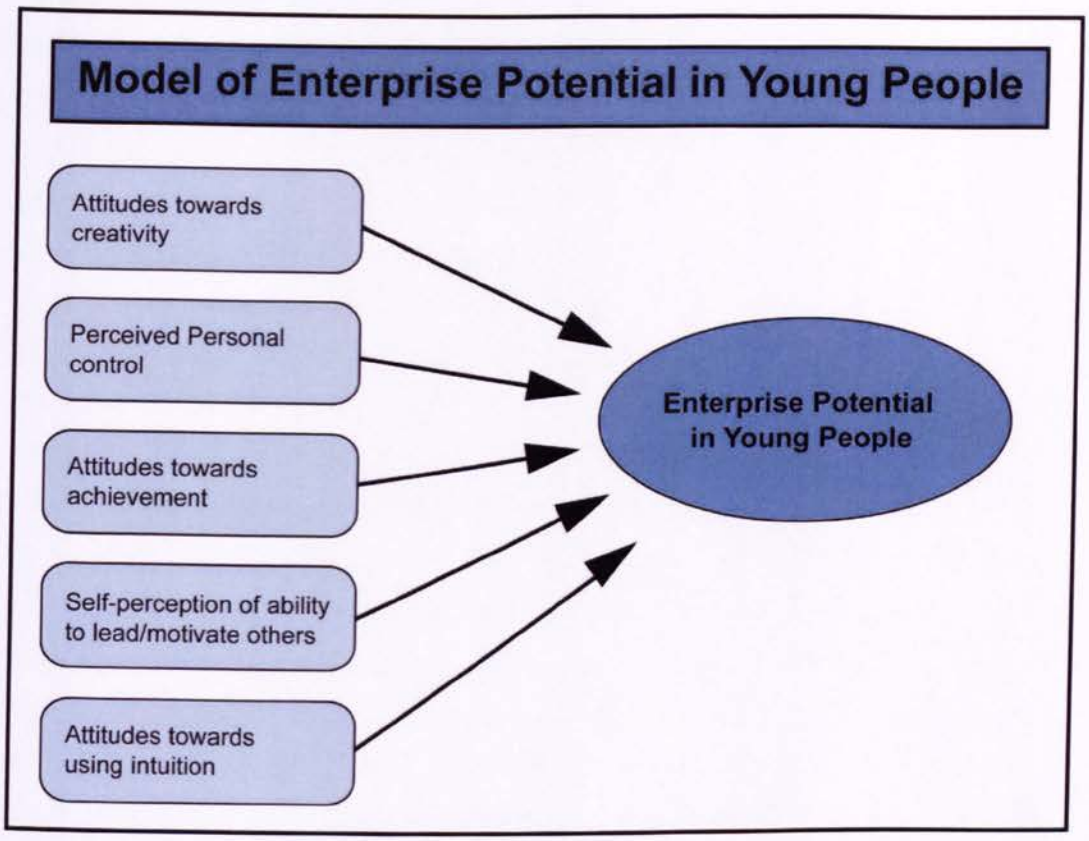
negotiation', planning' and 'decision-taking'. Grouped together these skills and attributes can be summed up as positive attitudes towards leadership. Timmons and Spinelli (2004:250) identify 'leadership' as one of the six key themes needed for new venture creation, and list skills such as 'team building', building 'trust' and being a 'self-starter. According to Timmons and Spinelli (2004) domains for leadership include: likes responsibility (e.g. put in charge of others), or may take responsibility in a group automatically because others expect it. A leader gets on well with people, is popular with those around them. They are good at motivating others to get things done and can create enthusiasm in other people. Sensitivity to one's environment in which others may be generating ideas means the need to see off rival proposals, persuade others of the worth of one's ideas and the need to take a lead in driving idea development forward (Witt, 1998). Leadership, and the attitudes associated with it, is thus a critical quality of entrepreneurs (Vecchio, 2003).

3.8 Developing a Framework for the Evaluation Tool

Based on this review of entrepreneurship dimensions a model of 'enterprise potential in young people was developed, using attitudes towards five dimensions strongly associated with entrepreneurship. In developing the model consideration was also given to the challenge of operationalising these attitudes in an appropriate way for young people still at school. Figure 3.1 gives an overview of the conceptual model which was developed to use as a basis for designing the programme evaluation tool. Attitudes towards five dimensions, associated with entrepreneurship and enterprise skills identified as key by Gibb (2000;1993) and informed by a review of previous research (Table 3.2):

- Perceptions of creativity
- Perceived personal control (autonomy, act on own initiative)
- Dynamic/achievement, (seeing things through, taking the initiative)
- Intuition (preferring informality to formality; coping with uncertainty)
- Self-perceptions of ability to lead

Figure 3.1 Model of enterprise potential in young people



The model implies that positive attitudes towards these five dimensions constitute 'enterprise potential' in a young person. By measuring the strength of a young person's attitudes towards 'achievement'; 'personal control', 'creativity', 'leadership' and 'intuition', it will be possible to measure their 'enterprise potential'. This enterprise potential has been identified as a necessary antecedent to an intention to create a new venture (Krueger and Brazeal 1994). It is in effect a particular frame of mind, a certain set of cognitions that would make a young person susceptible to form the intention to start a business. As such it is an antecedent to, but separate from the actual intention to start a business.

Table 3.2 provides an overview of the selected dimensions and behaviours, attributes and skills associated with each dimension. These dimensions have been selected because they are relevant to entrepreneurship and the promotion of enterprise skills in schools in the UK. As well as increasing academic attainment, Lord Leitch (2006) in his review of skills in the UK, recommended that core competencies such as problem-solving, communication, creativity and team-working should be embedded across all skills training and education. These skills are similar to the skills and attitudes often associated with entrepreneurship. The Employability Skills programme was an initiative jointly developed by the Department for Work and Pensions (DWP), Department for Innovation, Universities and Skills (DIUS), Jobcentre Plus and the Learning and Skills Council (LSC). Furthermore the New Deal programme was developed especially to meet the needs of Jobcentre Plus customers and includes a provision leading to an Employability Award that is based on the skills, behaviours and attitudes that employers want to see in people they recruit, such as self-reliance, team-working and communication and presentation skills. Once again, these skills are similar to many of the enterprise skills highlighted by employers' organisations such as the CBI (2009).

Creativity is associated with being flexible in responding to challenges, solving problems creatively, actively seeking opportunities and being versatile. Personal control is conceptualised as being autonomous and able to act on one's own initiative. A dynamic achievement orientated person is one who likes to finish off a task well, is self-confident and has goals. A person who uses intuition is one who can cope well with uncertainty. An element of risk-taking has been included in this dimension and an intuitive person is one who can take risks in uncertain circumstances. The final dimension of leadership is conceptualised as a negotiator and someone who can persuade others.

Table 3.2 An Enterprise Model for the Programme Evalution Tool

Evaluation tool dimensions:	Enterprise theory dimensions (adapted from Gibb 2000;1993)
Perceptions of creativity	Flexibly responding to challenges (B) Solving problems/conflicts creatively (B) Opportunity seeking (B) Creativity (S) Resourceful (A) Versatile (A)
Perceived personal control (autonomy, act on own initiative)	Acting on own initiative (B) Autonomous (A)
Dynamic/achievement (seeing things through, goal orientated)	Actively seeking to achieve goals (B) Commitment to make things happen (B) Achievement oriented (A) Dynamic (A) Self-confident (A)
Intuitive/(preferring informality to formality; coping with uncertainty)	Coping with and enjoying uncertainty (B) Taking risky actions in uncertain environments (B)
Self-perceptions of ability to lead	Persuading others (B) Persuasiveness (S) Negotiation (S) Decision taking (S) Planning (S) Problem solving (S)

Having defined the theoretical foundation of the evaluation tool the next task involves operationalising these definitions by developing a series of statements that will reflect the meanings of each. This process is set out in the next chapter, which is an overview of selecting the most appropriate methodological approach and techniques that should be used in this type of research.

Chapter Four :A Methodology For Developing the Evaluation Tool

4.1 Introduction

In Chapter Three a theoretical model for the basis of the evaluation tool was introduced. Given the problems with measuring traits, attitudes towards a constellation of dimensions associated with entrepreneurship and enterprise skills will be used instead (Azjen 1991; Robinson *eta l.* 1991). Robinson *et al.* (1991) used a similar approach in the construction of the Entrepreneurial Attitude Orientation scale (EAO). They measured participants attitudes towards four dimensions associated with successful business creation. A strength of attitude scales is that they are domain specific and should reflect the world as experienced by the respondents. In this case the respondents will be young people aged 15-18 still at school and therefore the attitude scale should reflect this. Building the scale on the theoretical foundations of the model presented in Chapter Three is the main task of this Chapter.

Therefore, this chapter includes a review of methodologies used to evaluate enterprise education programmes which will inform the design of a new enterprise programme evaluation tool. As argued in the previous chapters, enterprise development, including enterprise education, has been a central theme of international, and particularly UK government policies, since at least the 1980s, but the evidence base upon which such policies have been developed is not extensive and often lacking in methodological rigour (Hytti and O'Gorman, 2004; Hytti and Kuopusjärvi 2004; Storey 2003; Peterman and Kennedy 2004). Therefore, there is a need for a more effective evaluation of the rationale and outcomes from enterprise education policies to provide a more rigorous debate of the merits and scale of such interventions.

The main aim of this study was to develop a robust evaluation tool capable of measuring 'enterprise potential' in young people, as well as a research design that could firstly validate and test the reliability of the instrument, and secondly to isolate, and so measure, the impact of participation in an enterprise

programme using the tool. There has been an increasing body of literature on evaluation studies of enterprise programmes of one form or another. Many of these studies have already been evaluated by Hytti and Kuopusjärvi (2004) using Storey's (2000; 2003) hierarchy of methods, and many proved to be inadequate. Therefore it was necessary to search out more rigorous evaluations, which could be used to define good practices. This was done using Storey's hierarchy. The conditions for choosing the studies were that they had to meet an adequate level of rigour, and that they incorporated an evaluation tool with some psychometric properties. Psychometric properties refer to the reliability and validity tests carried out to develop both personality tests and attitudes scales (Chandler and Lyon 2001; Cronbach 1990; De Vellis 1991; Churchill 1979). In the end six studies were selected to be studied in-depth.

To inform the research design and methodology an in-depth review of research instruments and evaluation tools used in these six key studies was undertaken. These studies include both those concerned with developing a research instruments and evaluation tools; and those which have used various existing instruments to evaluate enterprise education programmes. Evaluations at both secondary and tertiary educational institutions from around the world were included, as the subject of this research was young people aged 16-18. Elements of good practice from this review were then used to design both the research study and the research tool.

Following this review, the theoretical background to the methodology is explained along with the conceptual framework for the research. The final section of this chapter gives a critique of research tools and methodologies for measuring entrepreneurship and evaluations of enterprise education for young people. The aim of this critique is to define the good practices derived from the studies and show how they will be incorporated into the design of the enterprise attitude scale for young people.

The theoretical model for the foundation of the evaluation tool was presented in Chapter Three. This showed that enterprise potential in young people was

conceptualised for the purposes of this research as a multidimensional concept. Enterprise potential is a constellation of attitudes associated with key dimensions of successful entrepreneurs and reflecting the wider concept of enterprise skills and enterprising individuals (Gibb 2002; 1993).

Having decided on a model of latent enterprise potential in young people, derived from a theory of planned behaviour, the next step was to design a research tool capable of measuring this potential within a particular context – which is twofold – 16-18 years olds intentions towards starting a venture in future, and as a way of evaluating the impact of enterprise education. The next section presents a review of existing research instruments and tools designed to measure entrepreneurship. Particular attention is given to the process of operationalising concepts, and steps taken to establish reliability and to validate the research instruments. Using the criteria for developing scales as research tools identified in the next section, good practices in scale development will be defined. Good practices from these studies will then be incorporated into the design of the programme evaluation tool to measure enterprise potential in young people.

4.2 Criteria for Developing Scales as Research Tools

In both psychology and marketing measurement scales are frequently used to measure unobservable phenomena (DeVellis, 1991) and are increasingly being used in the field of entrepreneurship research to measure entrepreneurial potential and intentions, as well as characteristics associated with entrepreneurship (Chandler and Lyon, 2001). Unobservable phenomena are abstract dimensions, and may relate to personality traits, attitudes, or competencies, and are known as latent factors or components. The strength or weakness of the latent factor or component is regarded as the cause of scores on a particular scale. For instance, the extent of a person's 'personal control' (latent variable) can be measured by how much they agree or disagree with a series of statements relating to behaviours, beliefs and feelings about personal control. To measure this using an instrument respondents could be asked to agree or disagree with the following statement:

"I believe my successes at school are down to my own determination."

Answers reflect respondents' belief in their ability to control their own achievements at school. To be meaningful and accurate such scales need to be both valid and reliable and based on clearly defined theoretical constructs (Churchill, 1979).

In a critical review of a decade of research design and construct measurement in entrepreneurship research, during the 1990s, Chandler and Lyon (2001) carried out a systematic analysis of 416 peer reviewed articles. Among the major issues the authors examined were: reliability procedures; validation procedures; specification of level of analysis; and analytical procedures including qualitative and quantitative techniques. They further identified the ways that have been used by researchers to establish the reliability of the consistency and stability of measurement scales. They found that the most common method was to test the internal consistency of scales by means of the coefficient alpha (Cronbach 1990; 1951).[8] Some of the studies reviewed used pre-existing scales whose reliability had already been tested, while other studies used specially developed scales. However, few studies reported rigorous pre-testing of these scales. Pre-testing refers to the practice of piloting the scales first to establish reliability and validity before using them in an evaluation study. The pilot testing needs to be carried out using a separate sample from the evaluation study. Scales, are in questionnaire format, and consist of a number of statements, to which respondents are asked to agree or disagree on a Likert type scale (e.g. from 1= disagree to 5 = agree).

Reliability is essentially the internal consistency of a scale, that is, the extent to which each statement correlates with the rest, and how well it correlates, with the total statement pool in the scale. There is debate about what constitutes an acceptable alpha score. A summary of over 800 articles of

[8] Cronbach's coefficient alphas form an important part of the development of scales and use of Cronbach alphas will be highlighted in the review of key studies.

empirical studies using Cronbach alphas found that reported coefficients ranged from 0.6 to 0.99 (Peterson, 1994). Malhotra (1993), and Tull and Hawkins (1993) recommend 0.6 as an acceptable threshold, while Nunnally and Bernstein (1994) and Churchill (1997), recommend 0.7. In multi-dimensional scales each sub-scale is a scale in its own right and should be tested for reliability separately.

A scale is valid if it measures the latent dimension it was designed to measure. According to accepted procedures in scale development (Chandler and Lyon 2001; Hair *et al.* 1998; Churchill 1997: DeVellis 1991; Nunnally and Bernstein 1994) there are three main requirements that scales must meet. The first, reliability has already been discussed. The remaining requirements is validity. There are a number of different types of validity including structural validity (also known as unidimensionlity), external validity and concurrent validity.

Structural validity refers to the structure of the scale, which should reflect the original theoretical model. So, if the model consists of five concepts (e.g. characteristics or attitudes related to entrepreneurship) then the statistical tests should reveal that in fact the statements group (converge) into five separate (discriminate) factors or components. Structural validity is arrived at by analysing convergent and discriminate validity usually through a process of factor analysis.

Factor analysis is used to determine whether a scale is unidimensional (measures only one latent dimension) or is in fact multidimensional, which would highlight weaknesses in the underlying theoretical construct. Factor analysis also provides evidence that respondents find items on one dimension similar to each other (convergent validity) but conceptually different to other dimensions (discriminant validity). For instance Carland *et al* (2001) developed the Carland Entrepreneurship Index (CEI) using factor analysis and Cronbach tests. During the pilot testing factor analysis was carried out to identify four unique factors. This showed that the CEI was multidimensional, in which case reliability tests should have been carried out on each sub-scale.

Instead the CEI scale was treated as a unidimensional scale and a reliability test carried out on whole scale. After establishing the multi-dimensional nature of the scale the researchers then went on to ignore it.

According to Churchill (1979) and subsequent researchers (e.g. Hair *et al.* (1998:118) a scientific method for establishing the validity of a new measure is the extent to which it correlates with other similar measures (convergent validity) and the extent to which it can be discriminated from other measures (discriminant validity). In this way, discriminant validity proves that the measure is indeed testing different (new) constructs.

External validity refers to the extent to which the dimensions relate to the attitudes/traits/competencies (latent dimensions) they are supposed to relate to in the real world. This can be established by using a sample of respondents known to display these attitudes, i.e. a predefined group, who would be expected to score significantly higher on the scale than other respondents. If the scale were measuring entrepreneurship, therefore, the predefined group would be a group of entrepreneurs.

As the focus of this study was 'enterprise potential' in young people, a predefined group is harder to find. Enterprise potential has not been studied using this type of scale before, so the validity of the scale needs to established from scratch. Therefore it was decided find a group of young people who showed a desire to start their own venture in future, and to classify this group as having enterprise potential. Then, if this group scored significantly higher on the scale than respondents who did not express a desire to start a business, the scale could be described as having a measure of external validity. Repeated studies would confirm the extent of external validity.

As the literature review showed researchers in the field of entrepreneurship have sought to identify a group of traits specific to the entrepreneurial personality and to develop research tools to measure these traits (Gurol and Atsan 2006; Louw *et al* 2003;Jackson *et al.* 2001; Carland *et al.* 2001;

Littunen 2000; Crant 1996; 1991;Bonnett and Furnham 1991; Caird;1991a;1991b). Less common have been studies which sought to identify attitudes associated with entrepreneurship as the basis for a research tool (e.g. Robinson *et al.* 1991). There follows a review of these studies focusing on the traits or attitudes identified, and the development and piloting of the research tool, critiquing the steps taken to establish the reliability and validity of the tools used. The weaknesses of a trait approach and of scales designed to measure traits were identified in Chapter Three. Instead, a more reliable method is attitude scales, which are closer to actual behaviours and are domain specific (Azjen 1991; Robinson *et al.* 1991). Attitude scales are designed to reflect the actual experiences of the respondents, which increases their reliability and validity. The next section demonstrates the criteria used to select key studies for review using Storey's hierarchy of methods (Storey 2000).

4.3 Criteria for Selecting Studies for Review

In response to the international increase in enterprise policies and a need to understand the links between programmes and outcomes (e.g. increase in start-up rates/business performance/enterprise skills, etc.), Storey (2003; 2000) developed a framework for reviewing the evaluations of a wide array of different types of enterprise programmes (Figure 2.1). The framework consists of six steps, of monitoring and evaluation methods, which increase in rigour and sophistication through from step I to step VI. The first three are simple monitoring of take up and feedback from participants, often carried out by the training provider.

Table 4.1 Storey's Six Step Typology

Step	*Level of sophistication*	*Description of techniques*
I	Monitoring	Number of participants.
II	Monitoring	Participants' opinions.
III	Monitoring	Participants' views of the impact of the programme.
IV	Evaluation	Comparison of participants with typical population.
V	Evaluation	Comparison with 'matched' non-participants.
VI	Evaluation	Taking account of selection bias.

The next three steps, identified as 'best practice' models, are those carried out by independent bodies. Key conditions are the use of representative samples, and techniques to isolate the impact of participation in an enterprise programme by controlling for other variables that may influence outcomes. The main focus in the final three steps is the comparison with control or non-participant groups and controlling for self-selection bias. Westhead *et al.* (2001) make similar criticisms of existing research and recommend that the design of evaluations meet certain basic standards. They make four main recommendations: first a representative sample of participants should be used; second, matched control groups need to be incorporated; third, pre and post (programme participation) testing should be carried out; and finally, objective as well as subjective outcomes should be measured. The following review of key studies uses studies that meet at least level IV criteria in Storey's hierarchy.

4.4 Review of Relevant Studies

The aim of the review is to identify good practices, which can be taken forward and incorporated into the design of the research tool to measure enterprise potential in young people. An overview of the studies is given in Table 4.1, which highlights the entrepreneurial traits or attitudes identified, details of piloting, and steps taken to establish reliability and validity of the research tool. Studies into the entrepreneurial personality have a long history

(e.g. Kets de Vries, 1985; Shapero, 1975; and McClelland, 1965). For the purposes of this research, however, the focus is on studies using multi-dimensional scales to identify characteristics or attitudes towards entrepreneurship. The earliest of these studies was carried out in the UK by Bonnett and Furnham (1991) and Caird (1991a; 1991b), and predate the recent allocation of funds for work-related placements and a focus on enterprise in secondary schools.

4.4.1 Who wants to be an entrepreneur (Bonnett and Furnham 1991)

Bonnett and Furnham (1991) administered a combination of pre-existing validated scales to explore differences between a group of young people who had volunteered for a Young Enterprise (YE) scheme and a control group not taking part. The scales used were a protestant work ethic (PWE) scale, a multidimensional scale incorporating hard work and delayed gratification; McClelland's (1965) need for achievement scale; a locus of control scale; and a perceived parenting scale. 'Delayed gratification' refers to the ability to forego short term gains in the interest of longer term and potentially more

Table 4.2 Research Instruments to measure entrepreneurship

Source	***Sample***	***Validity and Reliability Testing and statistics used.***	***Findings***
Who wants to be an entrepreneur? A study of adolescents' interested in a Young Enterprise Scheme. Bonnett C. and Furnham, A. (1991)	190 16-19 year olds 109 YE participants and 81 in control group	• Used pre-existing scales for internal locus of control, need for achievement, protestant work ethic, and perceived parenting scales. • Reliability and validity of scales had been established previously, but no reliability testing was carried out for the current sample.	• YE group scored significantly higher on internal locus of control and on PWE scale. • No differences between the YE and control group on need for achievement or perceived parenting.
Testing Enterprising Tendency in Occupational Groups. Caird, S. (1991a) The Enterprising Tendency of Occupational Groups. Caird, S. (1991b)	73 Owner managers 101 Teachers 33 Nurses 10 Clerical trainees 20 Civil servants 25 Lecturers and trainers	• No reliability testing. • T-test analysis showed that owner managers scored significantly higher than other groups on the GET test, apart from lecturers and trainers.	• The GET test did not distinguish between owner managers and lecturers and trainers, casting doubt on its validity. • A further methodological weakness is the use of the same data to develop the test and to test the enterprising tendency of occupational groups, making the study self-prophesising.
An Attitude Approach to the Prediction of Enrepreneurship. Robinson, Stimpson, Huefner and Hunt (1991)	Stage one: development of test with 63 respondents Stage two: external validation with 54 entrepreneurs and 57 non-entrepreneurs.	• Reliability testing during stage one development of the test. • External validation of test was successful, with entrepreneurs scoring significantly higher than non-entrepreneurs on all subscales and test overall.	• The four subscales of the Entrepreneurial Attitude Orientation scale (EAO): achievement, self-esteem, personal control, and innovation, were all internally reliable. • External validity testing showed that the EAO scale distinguished between entrepreneurs and non-entrepreneurs.
The Proactive Personality Scale as a Predictor of Entrepreneurial Intentions.	181 students (91 undergraduates and 90	• Crant's proactive personality scale used in three previous studies:	• Reliability tests in current study showed that he proactive

Crant, M. (1996)	MBA students).	• Unidimensionality supported by factor analysis. • Reliability ranged from 0.87 to 0.89. • Validity testing showed that the high scores were associated with proactive community service activities.	personality scale (PPS) had an alpha of 0.88. • Hierarchical regression analysis showed that the PPS explained a significant amount of variance in entrepreneurial intentions after controlling for gender, education and business ownership in parents.
Hunting the Heffalump: The Theoretical Basis and Dimensionality of the Carland Entrepreneurship Index.(CEI) Carland, J.W., Carland J.C., Ensley, M.D. (2001)	151 senior level business students. 211 small business owners 134 CEOs of *inc.500* firms (fastest growing private firms in US)	• Reliability testing using test re-test correlation, split-half analysis, Kuder-Richardson test for inter-item reliability. • Factor analysis used for validity. Carland Entrepreneurship Index (CEI) correlated with established instruments for concurrent convergent validity. • Predictive validity using regression analysis, and analysis of variance.	• Reliability tests found the CEI to be reliable (0.80, 0.78, 0.73), but tests for individual subscales not carried out. • The CEI converged with similar personality scales (convergent validity). • Discriminant validity showed the CEI capable of discriminating between CEOs oriented towards growth and those oriented towards providing a family income.
Enterprise Education: Influencing Students' Perceptions of Entrepreneurship. Peterman, N.E., and Kennedy, J., (2003)	109 participants on YAA *and 111 non-participants. Queensland, Australia secondary schools	• The measure was based on an existing measure and tested for reliability using Cronbach's Alphas. • No validity testing. • ANOVAs for pre and post testing.	• Pre and post testing control group design. • Aspects of self-selection measured and factored in.

*Young Achievement Australia (based on US model similar to Young Enterprise UK Company Programme)

gratifying rewards. The researchers hypothesised that the YE group would score higher on internal locus of control, need for achievement, hard work and delayed gratification than the control group. The perceived parenting scale was used to investigate whether there were any differences between the groups on parental pressure to achieve, and perceptions of parental nurturing. The study found that the YE group did in fact score significantly higher on internal locus of control and the PWE scales; but not on the need for achievement or the perceived parenting scales. The parenting scales were designed to measure different approaches to parenting from a distant authoritarian approach to a more liberal emotional approach.

The researchers concluded that the non-significant findings may have been due to the limited number of items used from the need for achievement and perceived parenting scales. The study did establish the value of using multi-dimensional scales to distinguish young people interested in enterprise, from young people who had shown no interest. The study can be criticised for using scales designed for adults, such as the need for achievement and locus of control scales, in a study on teenagers. It is not clear that the language used, or indeed the concepts would be relevant to young people. A requirement for the use of scales is that they are in fact relevant to the proposed audience. If reliability and validity tests had been carried out, however, the results may have revealed any shortcomings in the relevance of these scales for young people.

4.4.2 Testing enterprise tendency (Caird 1991)

In a review of the literature Caird (1991a; 1991b) identified five key entrepreneurial personality traits: calculated risk-taking; creative tendency; high need for achievement; high need for autonomy; and an internal locus of control. Based on this review a measure of enterprise tendency was developed (Caird 1991a;1991b), and used in a pilot study, which compared test results of different occupational groups; known as the General Enterprise Tendency or GET Test Findings indicated that owner managers scored

significantly higher than teachers, nurses, clerical trainees, civil servants, but not significantly higher than lecturers or trainers.

However, there are two methodological weaknesses of this study, which undermines the reliability and validity of the GET test. First, no reliability testing was carried out on the sub-scales, and as a result there is no indication that the items in each are correlated with each other or with the total sub-scale. More seriously, from a methodological perspective, the study is self-fulfilling. The same data was used to develop the tool, and then to measure the enterprising tendency of occupational groups. In other words, the study claims that the test is valid because owner managers score higher (on some scales) than other groups, such as civil servants, and then the study goes on to claim that owner managers have a greater enterprise tendency because they scored higher on the GET test. Separate samples should have been used to first develop the tool and establish its reliability and validity, and then new samples used to measure the enterprising tendency of different occupational groups.

Several further studies used the GET test or variations of it. In one study the test successfully distinguished between managers and graduates (Cromie and O'Donoghue 1992). The researchers then compared the mean scores from their own study with the scores of entrepreneurs in Caird's (1991a) original study. They found that the entrepreneurs mean score was significantly higher than that of managers or graduates. This, therefore, provided a measure of external validity (or criterion validity) of the GET test. However, in Caird's (1991a) study entrepreneurs did not score significantly higher than lecturers or trainers, and therefore further testing using this occupational group is still needed. Cromie and O'Donoghue (1992) also calculated the correlations between the five sub-scale dimensions, as a test of internal reliability of the GET test, and found that the dimensions were correlated with each other, apart from the locus of control scale. But, they did not test the internal reliability of each sub-scale using Cronbach's alphas.

Further research has used the GET Test in a variety of similar studies (Cromie 2000; Cromie and Callaghan 1997; Cromie and O'Donoghue 1992;), and a variation of the test was was used in a study of female entrepreneurs (Athayde, 1999). Athayde (1999) used a sample of 99 women business owners to measure enterprise tendency using a variation of the GET test. It was hypothesised that innovative entrepreneurs (as defined by Goffee and Scase 1985) would score higher on the test than either conventional business women or domestic traders. In fact there were no significant differences. However none of these studies carried out reliability testing using Cronbach's coefficient alphas or development of the tool through structural validity testing. This lack of reliability testing calls into question the reliability of the findings.

However, one study did carry out reliability testing of the GET test using Cronbach's alphas and test re-test reliabilities, along with criterion-related validities in predicting small business success (Stormer *et al.* 1999). The study was carried out in Canada with 128 business owners and 53 business owners that were included in a list of successful entrepreneurs. The GET test was administered to participants and reliability tests were carried out. Their findings showed that none of the sub-scales was internally reliable (creativity 0.54; risk-taking 0.48; achievement 0.46; locus of control 0.14 and autonomy 0.23). Further testing found some evidence for the external validity of the measure. Business owners with plans to expand their business scored higher on the GET test, than owners with no plans to expand. However, the test failed to distinguish between new business founders and owners of successful established businesses. This study highlighted the methodological weaknesses of the initial study on the GET test and concluded that use of the test was premature until reliability and validity are established. The next study to be reviewed (Robinson *et al.* 1991), came closest to meeting the three main requirements for scale development, reliability, structural validity and external validity, by addressing reliability and external validity. Structural validity using factor analysis was not carried out however.

4.4.3 An attitude approach to the prediction of entrepreneurship (Robinson *et al.* 1991)

This study by Robinson *et al.* (1991) charts the development and validation of a research tool designed to measure attitudes towards dimensions associated with entrepreneurship. The research comprised two stages. Stage one involved the development of test, the Entrepreneurial Attitude Orientation Scale (EAO Scale) with 63 undergraduates. Stage two involved the external validation with 54 entrepreneurs and 57 non-entrepreneurs.. Robinson *et al.* (1991) present attitude theory as an alternative to personality trait theory as a better approach to predicting entrepreneurship. Developments in social psychology have led to a definition of 'attitude' as a predisposition towards a particular object (which includes abstract constructs) (Azjen 1991)). The concept of 'attitude' is more dynamic than that of 'trait' as it is responsive to an external object, and is capable of change over time. An 'attitude' is also a much richer concept by being manifest in three ways: affective (emotions), cognitive (beliefs) and conative (behaviours) (Rust and Golombok 1989). Attitudes do not exist in isolation rather one has an attitude towards an object, which may be a concrete object or an abstract concept. This attitude specificity, as it is known, needs to be matched with measurement specificity in the design of an evaluation tool. Attitudes towards achievement in general, for instance, are different to attitudes towards achievement in a business context.

Robinson *et al.* (1991) based their design of the EAO instrument on a tri-partite model of attitudes, which includes cognitive, affective and conation or behavioural elements. The cognitive element represents beliefs about an object; the affective element represents emotions and feelings towards an object, while the behavioural element represents typical behaviours towards an object. The EAO scale was developed to measure attitudes towards four dimensions associated with entrepreneurship: achievement *in business*; self-esteem *in business*; personal control *of business outcomes* and innovation *in business*. Robinson *et al.* (1991) tested the tool on a group of sixty-three psychology undergraduates in a Canadian university. Cronbach's alpha

analysis showed all the subscales to be internally reliable, (innovation 0.90; achievement 0.84; self –esteem 0.73; and personal control 0.70).

In the next stage of the study, validation, the test was administered to a group of entrepreneurs and a group of non-entrepreneurs for external validation. A multivariate analysis of variance (MANOVA) showed that entrepreneurs had significantly higher subscale scores than non-entrepreneurs, which would be expected if the EAO was a valid instrument. Next the researchers carried out a stepwise discriminant analysis to see whether the EAO could predict membership of each group. The EAO was 77 *per cent* accurate in predicting group membership, and achievement was the least predictive subscale. This pilot study of the EAO succeeded in establishing the value of using attitude theory as the foundation for a research tool to distinguish between entrepreneurs and non-entrepreneurs, and goes some way towards predicting entrepreneurs.

The EAO has been used in two subsequent studies, one in the context of the health care industry in the U.S. comparing self-employed nurses with employed nurses (McCline *et al.* 2000); while in the second study an adapted EAO was administered to pupils in secondary schools in New Jersey U.S. (Rasheed 2002). McCline *et al.* (2000) used the EAO and additional exploratory subscales to test 'entrepreneurial opportunity recognition', and 'attitude towards risk', in nurses. An initial sample of 515 nurses registered on the National Nurses in Business Association (NNBA) was used to pilot the adapted measure. The NNBA encourages nurse-entrepreneurs in business ventures[9].

Factor analysis failed to identify the four factor structure proposed by Robinson *et al* (1991), though the researchers conclude this was probably due to the size of the sample. Cattell (1952) recommends that the sample size should be four times the number of items (for the EAO this would mean a sample size of 300). The researchers do not report any reliability testing

[9] A response rate of 29.9 *per cent* and missing data analysis led to a useable sample of 128 cases.

using, for instance, Cronbach's alphas, which would have been an important step in the development of this adapted measure. To validate the measure they used an analysis of variance (ANOVA), which showed that nurse-entrepreneurs scored significantly higher than non-entrepreneurs. A discriminant analysis procedure was used to compare the ability of the scales to correctly identify membership of the two groups (nurse entrepreneurs and non-entrepreneurs). The four Robinson scales taken together resulted in a 78.6 *per cent* correct classification. The Robinson scales together with the two new scales resulted in an 82.0 *per cent* correct classification. This study, thus, provides further evidence of the value of using an attitude approach adapted from social psychology to the identification of entrepreneurship.

Rasheed (2002) also measured attitudes towards entrepreneurship using the Robinson *et al.* (1991) Entrepreneurial Attitude Orientation Survey. A sample was drawn from pupils at secondary schools in New Jersey U.S. who were participating in an enterprise programme aimed at academically under-achieving young people, and a control group who did not participate. The programme involved simulations of product development and activities to stimulate negotiation, leadership and creative thinking. MANOVAs were calculated to compare differences between the participant group and the non-participant control group. The study found that participants scored higher on all four constructs than the control group.

Although the study provided further evidence of the value of the EAO, there were several weaknesses inherent in this study. Though control groups were used, no statistics were provided on grades in each group, or the demographic characteristics of each group, so it is unclear how well- matched the groups were. For instance if the participant group were predominantly male and the control group female then this could indicate that males were already more entrepreneurial before they started the programme. Pre-testing of both groups would have established if this was the case. The relevance of the Robinson *et al.* (1991) EAO to under achieving young people still at school can also be questioned. A scale that looks at attitudes towards achievement in business; personal control in business, self-esteem and

innovation in a business context, and was designed for adult entrepreneurs may not be appropriate for academic under-achievers. The language of the items in the EAO scale was revised after a pilot study provided feedback, to take into account classroom and project experience rather than a business context, but no details of modifications were provided. Even allowing for refinements and removing references to a business context, some of the language used in the EAO scale is sophisticated, using words and concepts that might not be accessible to under-achievers, for instance:

- I seldom follow instruction unless the task I am working on is too complex.
- I feel terribly restricted being tied down to tightly organized 'business' activities.
- I enjoy being the catalyst for change in 'business' affairs.

Source: Robinson et al. (1991)

This study did not carry out pre- and post-testing so the possibility of other influencing factors in the curriculum that could account for the findings has not been ruled out. A follow-up study could address these weaknesses in the original study, and provide valuable insights into the impact of enterprise education on young people from different ethnic minority backgrounds[10].

Finally, reliability and validity testing of the measure would have strengthened the findings of this study. It is good practice to test reliability when using pre-existing scales using for instance Cronbach's Alphas. Some validity testing using a pilot study and separate sample would also be expected. This study tested for neither, and given that the items used were modified and so were not identical to the original items in the measure that had been tested, there was even more reason to test reliability and validity. It is not clear that changes to the items were made within the limits of the original theoretical construction of the latent variables. Validity testing would confirm whether

[10] The sample used consisted mainly of ethnic minority students: 56.4 *per cent* Hispanic/Latin; 34.7 *per cent* African American; 3.6 *per cent* Caucasian; and 1 *per cent* Asian; and 4.4 *per cent* did not provide details.

changes made were within these limits or not, and so provide either valuable confirmation of the validity of the measure, or alert researchers to the lack of fit between the item groupings and the theoretical construction of the latent variables. The use of EAO scale in this study was not the best way to measure the impact of the programme. The EAO scale was not designed to be used on young people. Instead elements of the scale could have been retained and the statements redesigned appropriately for young people.

4.4.4 The Proactive Personality Scale (Crant 1996)

Crant's (1996) study used a sample of 181 students in a midwestern university in the U.S. (91 undergraduates and 90 MBA students) to validate the proactive personality scale in the context of entrepreneurship. Bateman and Crant's Proactive Personality Scale (PPS) was used in three previous studies, which sought to establish reliability and validity of the measure. The unidimensionality of the PPS was supported by factor analysis, and reliability using Cronbach's coefficient alphas ranged from 0.87 to 0.89. Validity testing showed that the high scores were associated with proactive community service activities. Reliability tests in Crant's (1996) study showed that the PPS had an alpha of 0.88.

Entrepreneurial intentions were measured using a three item scale (including: "I will probably own my own business one day"), with an alpha of 0.93. Validity testing was carried out using hierarchical regression analysis, which found that the PPS explained a significant amount of variance in entrepreneurial intentions after controlling for gender, education and business ownership in parents. The PPS showed strong internal reliability and validity over several studies, albeit only one in the context of entrepreneurship. Like other measures, however, despite extensive piloting, it has not been widely adopted by other researchers, perhaps because it was not grounded initially in a theory of entrepreneurship, but was based on the concept of a proactive personality.

4.4.5 The Carland Entrepreneurship Index (2001)

Carland *et al.*'s (2001) study sought to develop a valid instrument to measure entrepreneurship characteristics that could be used to examine the relationship of the entrepreneur to the performance of a business venture. The conceptual and empirical basis for the study was Sandberg's (1986) new venture performance model. Sandberg (1986) conceptualised the entrepreneur as a key feature of the new venture performance model and focused on the characteristics of the individual. The Carland Entrepreneurship Index (CEI) was piloted first on students in a southeastern United States university, then with local business owners, and a final sample of CEOs in the fastest growing private firms in the US. The authors proposed that entrepreneurship is a *gestalt* of four elements: cognition; preference for innovation; risk-taking propensity; and strategic posture (entrepreneurial managerial orientation). They argues that "these elements combine in an individual's psyche to produce a drive to create entrepreneurial ventures" (Carland *et al.*, 2001:58). The researchers carried out several pilot studies to develop the test.

The first pilot study used a measure included sub-scales based on the four dimensions identified above and consisted of forty forced choice statements (yes/no). There are no examples of the statements in their paper, however, and, there is little evidence of the conceptual development of the dimensions. There are several areas that are unclear about the conceptual development, and several questions that can be asked. What is the conceptual basis for "cognition", for instance, and how does it differ from "entrepreneurial orientation"? Cognition is a psychological term for knowing and understanding, and the cognitive style of entrepreneurs has been the subject of previous research (e.g. Carland *et al.*, 1995). The authors of the CEI, however, do not really explain their conceptualisation of the entrepreneur's cognitive style. Nor do they fully explain what is different or unique about it? Obviously it does not include risk-taking propensity, preference for innovation or entrepreneurial orientation, as these are separate dimensions, with distinct subscales.

Another problem in the conceptual development of the CEI is that the researchers have used a mixture of psychological paradigms for their measure, including personality trait theory and cognitive theory. It is not clear whether this research instrument is capable of addressing both these paradigms, let alone whether one instrument would be able to measure them. This apparent lack of conceptual development is an important issue, which has repercussions when the researchers come to carry out tests to establish the reliability and validity of the CEI.

Several samples were used to establish the reliability, concurrent convergent and discriminant validity of the Carland Entrepreneurship Index (CEI). The first sample comprised of 151 senior level business students at university. Students completed the CEI, a self-rating scale on entrepreneurial tendency (details not provided), and the Myers-Briggs Type Indicator (MBTI) (introversion/extraversion personality scale). But the use of the MBTI in this study introduces another psychological paradigm, that of Jungian analysis, which needs to be justified. The second sample of 211 local small business owners completed the CEI, the MBTI and the Innovation, Achievement, and Risk-Taking Propensity scales of the Jackson Personality Inventory and Jackson Research Form (Jackson 1976). These respondents were also asked to provide details of goals, objectives and strategies.

Criteria for develop scales indicates that reliability testing would be carried out first, prior to any validation. In this case, the researchers first sought to validate the CEI through the use of principal component factor analysis using varimax rotation. The main problem with this approach is that factor analysis does not establish validity, it establishes common underlying structures in the items used to measure the constructs. These structures are called factors but should not be confused with constructs. They may map on to theoretically established concepts but they do not establish the validity of the concepts or factors. Instead, factor analysis can be better understood as a method of establishing reliability, in that it can demonstrate internal consistency similar to an item total correlation resulting in Cronbach's Alpha. It can also show whether a scale is unidimensional and so measuring one latent variable or it is

multidimensional with more than one latent variable. In which case the conceptualisation of the construct may need to be reviewed.

The authors have included the factor loadings for all of the items on all four factors, which makes the results difficult to read. Seven of the items were dropped as they failed to establish within and between the structures. Of the remaining 33 items none of the factor loadings was particularly high, with only two items over .05. There is no guide to the statements the items represent, so it is difficult to critique these results. One important point is that as a varimax rotation was used, the authors assumed that the constructs were orthogonal, that is they were not related. If they are not related then the reliability of each subscale needs to be established separately. In a final step in the analysis reliability testing was carried out on all the items in the CEI, however, not on individual subscales. This implies that all the items, and the subscales, are related, however this is contrary to the assumption underlying the use of a varimax rotation, which assumes that they are unrelated. This confusion in the approach to reliability and validity testing reflects the confusion apparent in the conceptual development of the underlying constructs and the combination of theoretically distinct paradigms.

Different theoretical paradigms suit different methodological approaches, and it is not clear that one instrument is capable of addressing the range of paradigms used. The researchers went on to administer the CEI to a sample of 134 CEOs of *inc.500* firms (fastest growing private firms in the US). This step seems premature, however, given the problems with reliability and validity testing. The lack of conceptual development, mixing of distinct psychological paradigms, and subsequent confusion behind the reliability and validity testing, however, may have possibly undermined the initial development of the CEI. It is clear from the experience of this study that a sound theoretical base is needed for scale development which is preferably located in a discrete paradigm. In learning from this therefore, the attitudes to enterprise test will be based on attitudes rather than traits and will follow clearly defined criteria for developing scales (e.g. De Vellis 1991). The instrument design will be based on procedures for the development of attitude

tests, including Rust and Golombok's (1989) blueprint for defining constructs (dimensions), and Cronbach's 'essentials' for testing (1990). The design will also be informed by paradigms for scale development used in the field of marketing (Gerbing and Anderson 1988; Churchill 1979).

4.4.6 Enterprise education: Influencing students' perceptions of entrepreneurship (Peterman and Kennedy 2003)

The Peterman and Kennedy (2003) study combined pre- and post-testing with a matched control group, along with an attempt to control for selection bias. The sample was drawn from secondary schools in Queensland Australia and included participants on a Young Achievement (YA) programme and a matched control group. YA is based on the Young Achievement US model, similar to the UK's YE Company Programme, which is the subject of the present research. Young Achievement and Company Programme entail pupils setting up and running a 'live' business under the guidance of a mentor for a period of one academic year.

The study used a measure of perceived desirability and perceived feasibility (of starting a business) derived from Krueger and Brazael (1994). Initial hypotheses of the study were supported, which posited that respondents with positive prior experience of business (parental self-employment) would be more likely to have a desire to start their own business, and that participants on the programme would have more experience than the control group. This shows that participants already had a predisposition towards enterprise prior to taking part. The researchers used two three-way mixed design ANOVAs to measure the impact of the programme on perceived desirability and feasibility (dependent variables). The three independent variables used were: breadth of prior experience; whether the experience was positive and time (pre- and post-test). The results showed that only time was significantly related to the dependent variables when controlling for prior experience. Participants' desire for starting a business had increased after the programme, while the control group remained the same.

In terms of reliability and validity testing of the measure used, the study went some way to meeting the requirements identified by Chandler and Lyon (2001). They used a pre-existing measure whose reliability and validity had already been tested. The authors then re-tested the measure for reliability using Cronbach's alphas. The scores obtained were low: 0.63 and 0.66 for perceived desirability (pre and post test); and 0.64 and 0.77 for perceived feasibility (pre and post test), 0.7 is the most commonly used threshold for acceptability. The main weakness of the Peterman and Kennedy (2003) study was the lack of validity testing of the measure used for the current sample type (i.e. young people still at school). The authors could have used a pilot sample of young people with parents in business and a group with no parents in business. Discriminant analysis would have shown whether the measure was able to distinguish between the two groups thus providing some evidence of validity. This would have provided further evidence about the effectiveness of the measure, deepening an existing research stream, as recommended by Chandler and Lyon (2001).

4.5 Summary of Review

The six key studies were reviewed for instrument design in entrepreneurship, noting the three key requirements for scale development namely, reliability, structural validity and criterion validity. The first study 'Who wants to be an entrepreneur (Bonnett and Furnham 1991) used existing personality scales to measure the impact of participating in a Young Enterprise Programme. The second study used a specially design research instrument based on personality theory, the GET test, to measure enterprise in different occupational groups. The next study used an attitude approach to the design of an instrument to measure attitudes toward entrepreneurial dimensions (Robinson *et al.* 1991). The fourth study used an existing personality trait scale designed to measure pro-active personality, in a study of undergraduates (Crant 1996). The fifth study charted the development of the Carland Entrepreneurial Index (Carland *et al.* 2001). The final study used an existing test based to measure perceived feasibility and desirability of starting a business (Peterman and Kennedy 2003). The relative strengths and

limitations of these key studies is explained in the following sections and outlined in Table 4.3.

Table 4.3 Strengths and Limitations of Key Studies

Source	***Strengths and Limitations***
Who wants to be an entrepreneur? A study of adolescents' interested in a Young Enterprise Scheme. Bonnett C. and Furnham, A. (1991)	Use of existing scales - reliability established No confirmatory reliability testing.
Testing Enterprising Tendency in Occupational Groups. Caird, S. (1991a) The Enterprising Tendency of Occupational Groups. Caird, S. (1991b)	Validity test showed the test could distinguish between owner managers and lecturers on some sub-scales. No reliability testing.
An Attitude Approach to the Prediction of Enrepreneurship. Robinson, Stimpson, Huefner and Hunt (1991)	Reliability tests carried out to establish reliability of new test. Concurrent validity established through the use of the Myers Brigg Index. Test was externally validated using entrepreneurs. Unidimensionality of sub-scales not established.
The Proactive Personality Scale as a Predictor of Entrepreneurial Intentions. Crant, M. (1996)	Factor analysis established the unidimensionality of scales. Reliability tests carried out. Some external validity test – not with entrepreneurs.
Hunting the Heffalump: The Theoretical Basis and Dimensionality of the Carland Entrepreneurship Index.(CEI) Carland, J.W., Carland J.C., Ensley, M.D. (2001)	Reliability tests to establish reliability – but not on individual sub-scales. Factor analysis used to identify factors. Validity testing correlated with existing measures. Could distinguish between high growth CEOs and non-high growth.
Enterprise Education: Influencing Students' Perceptions of Entrepreneurship. Peterman, N.E., and Kennedy, J., (2003)	Reliability tests carried out on existing scales.

One of the earliest studies reviewed was by Bonnett and Furnham (1991) in which they carried out a control-design cross-sectional study of participants on a YE Company Programme. They used pre-existing tests and found that the participant groups scored significantly higher on internal locus of control compared to the control group. Caird's study (1991a:1991b) charted the design and pilot testing of a the General Enterprising Tendency test on different occupational groups. Entrepreneurs were found to score higher than

some groups but not lecturers or trainers. Robinson *et al.* (1991) developed an attitude scale, in a two stage study, to compare attitudes of entrepreneurs with other occupational groups. Entrepreneurs were found to score higher on attitudes to achievement, innovation and other dimensions. A previously developed pro-active personality scale was used by Crant (1996), to distinguish between MBA students and undergraduates. The Carland Entrepreneurship Index (2001) did distinguish between growth oriented CEOs and others, but individual reliability testing for individual scales was not carried out. Finally, Peterman and Kennedy (2003) used pre-existing measures in a longitudinal study to measure the impact of a Young Achievement Australia programme on attitudes towards starting a business. Participation was found to be correlated with the development of more positive attitudes.

Reliability testing was carried out in some studies, usually using Cronbach's coefficient alpha, and this is an acceptable method increasingly used in entrepreneurship research. Where it was not used the findings of the research are undermined, because the reliability of the scales are in doubt. Therefore, a key requirement for this research is to establish the reliability of the newly developed scale Cronbach's alphas. The use of structural validity in the studies reviewed, using principal component analysis (PCA), was less common and reported in only one study, Carland *et al.*'s (2001). There was sometimes confusion about whether the dimensions were in fact correlated or not, and how the PCA findings helped to validate the measure. PCA is a useful tool in scale development (Chandler and Lyon 2001;DeVellis 1991), and though less used in entrepreneurship research, it has a well established history in psychology and marketing. Therefore, PCA will be used in this study to explore the underlying structure of the new instruments and to identify whether the structure maps onto the conceptual framework.

Concurrent validity was used in only one study, the Carland Entrepreneurship Index, and this could be adopted more in entrepreneurship research. External validity testing is much more common in the reported studies reviewed in this chapter, and has been shown to provide a useful validation process of newly developed scales. External or criterion validity involves using a pre-defined

group - a group which possesses the characteristics the instrument is intended to measure. The new scale is then administered to this group, and a control group which do not possess the characteristics being measured. The dependent variable is the mean score on the scale, while the independent variable is the group variable. To successfully establish that a scale has external/criterion validity the pre-defined group should score significantly higher than the control group on the test. From this review and the key points outlined in Table 4.2 several good practices in instrument design and use can be defined. Firstly, the tool has to be relevant to the experiences of the respondents. Next the reliability and validity of the tool has to be established using pilot studies. Once the tool has been refined and is reliable and valid then it can be used in evaluation studies.

It should be noted that since this review of relevant studies was carried out there has been an increase in the development of scales to measure a range of enterprise related traits and attitudes. In March 2009 my own paper on the early pilot study of this research was published in Entrepreneurship, Theory and Practice (ET&P). That year also saw a number of other papers, also published in ET&P, reporting the development of new scales. These included for instance 'Individual entrepreneurial intent: construct clarification and development of an internationally reliable metric', (Thompson 2009); 'Entrepreneurial Self-Efficacy: Refining the Measure', (McGee et.al 2009) and 'A Measure of Adaptive Cognition for Entrepreneurship Research' (Hayne and Shepherd 2009). None of these studies was focused on young people still at school, and so this remains an under researched area. It was not possible to incorporate any details from these studies though, as my own research had been completed by this time. It does, however, serve to reinforce the topicality of this research area.

This study has proposed a working definition of 'enterprise potential' in young people grounded in an intentions model of entrepreneurship. To validate the evaluation tool at this pilot stage the initial sample of young people will be divided into two groups, those who indicate future intentions towards starting their own business, and those who do not. If the group who expressed their

intentions to start a business in future score significantly higher on the attitude measurement scale than the other group, then this will have gone some way towards establishing the external validity of the measure.

The following sections of this chapter explain the procedures followed to develop the evaluation tool and a table is provided, which lists the statements generated to measure the five selected dimensions.

4.6 Designing the Programme Evaluation Tool

The review of studies investigating 'entrepreneurial potential', presented in Chapter Three, highlighted the central role played by cognitive mechanisms such as attitudes and perceptions on the antecedents of entrepreneurial behaviour. Developing a tool to measure 'enterprise potential' in young people requires a clear conceptual framework that is relevant to young people, as well as the field of entrepreneurship theory. A review of attitude theory, and dimensions associated with entrepreneurship led to the design of a model of 'enterprise potential' in young people'. Five key dimensions were selected for inclusion in the conceptual framework to underpin the evaluation tool:

- Perceptions of creativity
- Perceived personal control (autonomy, act on own initiative)
- Dynamic/achievement, (seeing things through, taking the initiative)
- Acting on intuition (preferring informality to formality; coping with uncertainty)
- Self-perceptions of ability to lead

In this study the tool is designed to measure enterprise potential in young people, and establishing the reliability and validity of the tool is a vital part of this design process. Enterprise potential in young people has been conceptualised in this study as a constellation of attitudes in young people, which are normally associated with enterprising individuals, in other words, attitudes oriented towards entrepreneurship.

The use of attitudes in this study, instead of personality traits, has been placed into a sound theoretical framework. This research is based on cognitive theories of entrepreneurship. Whereas trait theories are based on innate qualities, cognitive approaches focus on the decision-making processes of entrepreneurial behaviour. According to cognitive theorists, decisions are made based on *perceived* reality, therefore the perceptions of the entrepreneur are key (Anderson 1980). The entrepreneur's perceptions include their attitudes towards starting a business. Based on an attitudes model of motivation entrepreneurship can therefore be explained by the potential entrepreneur's attitudes towards starting a business (Robinson *et al.* 1991). Attitudes, it is argued, are more specific than traits, and are capable of being influenced by circumstances (and by experiential education programmes). There is also a considerable body of knowledge acquired through empirical research and analysis on attitude scales, which can be applied to the present study (Oppenheim 1992).

This research draws on an attitudinal theory of enterprise based on a tri-partite model of attitudes (Robinson *et al.* 1991). An attitude is a psychological tendency that is expressed by evaluating a particular object either favourably or unfavourably (Eagly and Chaiken 1998). The object in question can be concrete (a physical object or event) or an abstract entity (e.g. the concept 'freedom'). Manifestations of an attitude are divided into three parts. The three parts of the model are 'cognitive', 'affective', and 'behavioural' (Greenwald *et al.* 1968; Rosenberg and Hovland 1960). The cognitive component consists of beliefs about the attitude object; the affective component includes emotions and feelings towards the object; and the behavioural component consists of actions directed at the object as well as behavioural intentions.

There is continuing debate about conceptual and operational issues, surrounding the measurement of attitudes. One of the main conceptual problems is that attitudes are one of many determinants of behaviour. A range of situational factors will also influence actual behaviours. Attitudes, therefore, can best be described as *predispositions* towards certain

behaviours. To successfully measure attitudes, a high degree of specificity is needed (Ajzen and Fishbein 1980). Statements in a test must be context specific, rather than general statements about feelings towards an object.

Following this conceptualisation, young peoples' orientation or attitudes towards these dimensions need to be defined in a way which makes them relevant to young people in school. Attitude theory was used as the foundation for operationalising the dimensions used in the tool. It is argued that the strength of a young person's attitudes towards these dimensions will be an accurate measure of their 'enterprise potential'. According to the tri-partite theory of attitudes, they are comprised of three distinct elements: cognitive, affective and behavioural. 'Cognitive' refers to beliefs held about the subject, 'affective' refers to emotions and feelings about the subject and 'behavioural' refers to the common behaviours associated with the subject. Consequently, for each of the five dimensions statements were created that were reflections of beliefs, emotions, and common behaviours. Table 4.2 shows the classification of statements according to the five dimensions and cognitive, affective, and behavioural elements of an attitude. A total of 18 statements were generated for each dimension making a total of 90.

The final questionnaire comprised two parts, the evaluation tool to measure enterprise potential in young people, and a section designed to collect demographic information to enable cross comparison between school, gender, type of school attended, and a family background of business ownership. Also included in this section were questions about pupils' future career plans and intentions towards starting their own business in the future. These data combined with the data from the ATE test were then used as the basis for further development of the ATE test, through statistical techniques. The main section was the actual scale (evaluation tool) and is referred to as the attitudes towards enterprise scale, or ATE test.

First the concept of "enterprise potential in young people" was defined as a multidimensional concept comprising five dimensions, using the theoretical framework as shown in Chapter Three. Attitudes towards these dimensions

were then defined using a tri-partite model of attitudes, which includes beliefs and feelings towards an object and behaviours in relation to an object. The framework identifies five attitudes as key to enterprise potential:

- Attitudes towards creativity (beliefs about the importance of creativity and personal assessment of creativity, i.e. 'how creative am I'?).
- Perceived personal control over future career.
- Attitudes towards achievement in project work (seeing things through, taking the initiative).
- Attitudes towards using intuition in problem solving (preferring informality to formality; coping with uncertainty).
- Self-perceptions of ability to lead, motivate and persuade others (classmates and friends).

The meanings attributed to these dimensions along with potential attitudes towards them, including beliefs, feelings and behaviours were then used as the basis for generating statements. Responses to the statements are deemed to be a reflection of respondents' perceptions about their ability, and as such the measure incorporates the concept of "self-efficacy". Statements were developed that reflected the meaning of each dimension and also either beliefs, cognitions or behaviours towards "creativity", "leadership", "achievement", "personal control", or "intuition". Given the importance of making sure that statements are domain specific, a range of classroom situations were used to provide a context (Table 4.4). For instance, for the creativity dimension statements were worded to refer to schoolwork, e.g. "I think I show a lot of imagination in my schoolwork." For achievement one statement was framed in terms of project work, while another probes self-beliefs about energy levels, and how respondents view themselves compared to class-mates. Statements in the personal control dimension assess pupils' attitudes towards working on their own, getting guidance from teachers compared to figuring things out oneself. The intuition statements were framed in terms of problem-solving, using heuristics, and attitudes towards learning through making mistakes, and attitudes towards being prepared to take a risk by having a guess. Finally, the leadership statements aim to measure

willingness to take responsibility for group work and motivating and persuading classmates.

Table 4.4 Statements classified by dimension and attitudinal elements

Dimension	Cognitive	Affective	Behavioural
Creativity	I think I show a lot of imagination in my schoolwork I believe that a good imagination helps you do well at school. I think I am one of the least imaginative people in my class. I think I am the least creative person I know at school. I believe that teachers over-rate the importance of "creativity and imagination". I think that being creative is an advantage at school	I enjoy lessons where the teacher is always trying out different ways of teaching. I prefer to choose my own topics for projects rather than being given a topic. I like lessons that really stretch my imagination. I dislike it when a teacher goes all "creative". I don't enjoy lessons where the onus is on the pupils to come up with ideas. I dislike teachers who are always coming up with "new ideas".	There is always someone who comes up with better ideas in my group than me. My friends often ask me for advice because I am full of good ideas. A teacher is unlikely to ask me if they are looking for new ideas about something. I can often find better ways of doing things in class. I'm never the one to have a 'brainwave' among my friends I'm always the one who comes up with bright ideas among my friends
Dynamic/ Achievement	I have a lot of faith in my own abilities to do well at school. Once I've started something in class I like to see it right through to the end. I have a lot more energy than most people at school. I don't feel it's necessary for me to achieve much at school. I'll probably spend my career plodding along quite happily.	I would rather stay in the background of things we do at school. I would rather not have any responsibility in projects in class. I like to have a role at the margins of a project. I always like to get my own way with my friends. I like to get things finished properly in class.	I usually end up giving in to other people at school. I'm usually the 'driving force' among my friends. There is always someone else who's willing take responsibility for a project Other people usually look to me to get things'off the ground' when we've got a project to do.

	It's not important to set goals for what I need to learn.	It feels good when a project works out well.	I don't have the energy to 'make things happen' in class.
Personal Control	My future career is really out of my hands. I think my future career success is largely up to me. Other people will get all the best jobs. If I want something done it's up to me to get on with it. I believe my successes at school are down to my own determination My grades depend entirely on how good the teachers are.	I prefer to figure things out on my own than always rely on a teacher to explain. I like to get on with things in class rather than be taken through step-by-step by the teacher. I don't like lessons where we are left on our own to get on with things. I prefer lessons where the teacher tells us exactly what to do. I dislike having to make decisions for myself in class. I enjoy having to make decisions about things in class.	If I can see a better way of doing something in a lesson then I'll always say so. If I'm not happy about something at school I usually tell someone who can do something about it. I usually get on with things in class rather than wait for everyone else. I'd rather be late than turn up anywhere without my friends. I always wait for the teacher to explain things before having a go myself. I usually go along with whatever my friends decide.
Intuition	I think that hunches can often be the best kind of guides when learning something new in class. Making mistakes is a good way to learn. I can often instinctively figure out solutions to problems we are set. If you don't know all the facts about a problem then there is no way you can figure out how to solve it. I believe there is a right way and a wrong way of solving problems we are set	I trust my own instinct when making decisions in a lesson. I prefer to jump into a situation and then figure out how to swim! I am happy to go off and do something with my friends on the spur of the moment. I prefer teachers who don't spring surprises on you in class. I like to know exactly where I stand with my	I'll have a stab at a solution to a problem rather than give up. If I don't know the answer to something then I'll usually have a guess. I'm likely to have a go at something new in class even if I might make a fool of myself. I'm best at the kind of subjects where everything you need to know is written down in books.

	in class. There's no such thing as "sixth sense".	friends. I don't like making decisions unless I have all the facts.	I tend to do things exactly the same way the teacher showed us. I never take short-cuts when learning something for the first time.
Leadership/ vision	Class mates expect me to have an answer for everything. My friends are usually happy for me to make the decisions. I think I can easily carry my class mates with me when I have an idea. My class mates rarely take much notice of what I have to say Teachers don't expect me to make many decisions. My friends would say I am a follower rather than a leader.	I enjoy talking the class round to my point of view. I enjoy taking on responsibility in the classroom I like taking the lead in projects at school. I like making the decisions for a whole group of us. I prefer to let another class mate take the lead. I don't like being the centre of attention in class.	If my class mates can't agree about what to do on a project then I don't get involved. I usually take the initiative on any project I'm involved in. When we do a school project I'm always right there at the centre of things. I can usually convince my class mates to do things my way. I'm good at motivating my class mates. I like to concentrate on my own responsibilities in projects.

Chapter Five: Pilot Study - Validating the Evaluation Tool

5.1 Introduction

Towards the end of Chapter Four the first version of the evaluation tool to measure enterprise potential in young people was presented. This chapter will chart the progress of the first pilot study of this new tool. An abbreviated version of this chapter formed the basis for a paper which was published in the peer reviewed journal Entrepreneurship, Theory and Practice in March 2009. This paper also included a cross-sectional study of a Young Enterprise Company Programme in secondary schools in London. This cross-sectional study has not been included in this thesis, because a subsequent longitudinal study has instead, which is included here in detail, in Chapter Seven. The remainder of this chapter explains the procedures and analyses undertaken for the first pilot study of the test.

The design was based on a model of 'enterprise potential' in young people comprising five dimensions: perceptions of creativity; perceived personal control; dynamic/achievement; acting on intuition; and self-perceptions of ability to lead, motivate and persuade others. Attitude statements were generated for each dimension which also reflected three aspects of attitudes namely, cognitive, affective and behavioural. The focus of this chapter is the first pilot test of this instrument. The need for a pilot at this stage is to test the reliability and validity of the measure before it can be used in an evaluation. Criteria for piloting an attitude scale, identified in the previous chapter, are translated into procedures including statistical testing and a review of statements (Hair *et al.* 1998). Before the pilot testing could begin a sample of young people had to be found who could complete questionnaires which would be used as data. The Small Business Research Centre at Kingston University has carried out a number of evaluations for Young Enterprise (YE) and it was decided to approach YE London for help with access to a suitable sample.

The aim of Young Enterprise is to help young people to develop the attitudes and skills for enterprise, life-long learning and for employability. They deliver practical activity based enterprise programmes in schools led by business volunteers who act as mentors. YE London were approached to whether they would be willing assist

with the research project by providing access to samples of young people attending London secondary schools. A face to face meeting with the Director of Young Enterprise (YE) London was held in August 2002 to discuss the proposed research and to seek the assistance of YE in recruiting schools. Following discussions with YE it was decided to administer a pilot questionnaire containing the evaluation tool to participants at two YE Master Classes to be held in central London during the autumn. The aim of the Master Classes is to allow young people to experience during the course of one day what a Young Enterprise Programme is like, by carrying out a range of activities. The class is designed to help pupils to understand the main issues and practicalities of enterprise such as who to approach for finance and help and advice. It also encourages them to think about starting their own business as a career option and to identify the skills needed. Questionnaires were distributed to 250 pupils and a total of 212 were returned making a response rate of 85 *per cent.* Due to a number of spoilt or incomplete questionnaires a final total of 196 were coded into SPSS for analysis.

As described in chapter four (the methodology chapter), there are generally accepted procedures for scale construction, which have theoretical and empirical foundations in several disciplines including psychology, marketing and over the past two decades, in business-related fields including entrepreneurship. There are several underlying assumptions and essential requirements for creating new scales, concerned with reliability, uni-dimensionality (structural validity), concurrent validty, and external validity (Chandler and Lyon 2001; Hair *et al.* 1998). Scales are required to be uni-dimensional, which means that statements are strongly correlated with each other and represent a single dimension. In a multi-dimensional scale, such as this scale for measuring enterprise potential, the requirement is that each sub-scale is uni-dimensional. Reliability refers to the internal consistency of the statements and how well they correlate with each other. Finally, external validity requires that an objective test is performed, which establishes that the scale is measuring what it is intended to measure. Through a process of reliability testing and validation a new scale is 'purified' of weak statements that do not correlate well with the rest (DeVellis 1991: 63).

The overall aim, therefore, was to purify the measure, using these requirements, to reduce the number of statements so that the remaining statements accurately reflected the meaning given to one of the five dimensions: creativity, personal control, leadership, achievement and intuition. This chapter charts the process of scale development through the use of statistical techniques to meet the three main requirements, reliability, undimensionality and external validity. An outline of the pilot study process is presented in Figure 5.1.

Figure 5.1 Outline of Pilot Study

Procedure	Activities	Aim
Gaining access to a sample of young people	Engagement with YE London.	To get access to a sample of young people to use in the first pilot test of the research tool.
Attending YE Master class in London.	Handing out questionnaires to participants on arrival. Taking part in the class. Answering queries about the questionnaire. Taking notes on feedback. Collecting questionnaire at the end of the session.	To collect completed questionnaires to use in the pilot test. To assist respondents by answering queries. To collect feedback on the statements to use in the re-design of the tool.
Reliability Testing	Cronbach's coefficient alpha	To examine the internal reliability of each of the five sub-scales.
Structural validity testing	Principal Component Analysis (factor analysis)	To examine the underlying structure of the instrument, and in particular to discover whether the components extracted, map onto the original five dimensional design of the instrument and thus determine whether they are unidimensional.
External or criterion validity	Comparison of the mean score of a pre-defined group and a control group using a T-Test. Secondly, to investigate whether the mean scores remain significantly different when other demographic factors are taken into account.	To test whether the instrument is measuring what it is intended to measure i.e. 'enterprise potential'.

The next section outlines the methodology of the pilot study and the procedures which were followed to collect the data. Then, each of the three main requirements for scale development, as outlined in Figure 5.1, is dealt with in turn: first reliability, then unidimensionality, also known as structural validity, and finally external or criterion validity. To begin, explanations of these three concepts are given. This is followed by a description of the processes involved in carrying out these requirements to develop the evaluation tool, using the pilot data, and how each requirement contributed to this development. The findings of the statistical tests are

presented along with detailed explanations about the interpretations that were made of these findings, and how judgements were arrived at.

5.2 Method

5.2.1 Introduction

Following standard procedures for scale development, identified in Chapter Four (Haynie and Shepherd 2009; McGee *et al.* 2009; Chandler and Lyon 2001; Hair *et al.* 1998; Churchill 1979; DeVellis 1991; Cronbach 1991: Gerbing and Anderson 1988; Comrey 1988;: Nunnally and Bernstein 1994), the reliability testing and validation of the measure was developed through a series of iterative steps. The statistical techniques used were designed to meet the three main requirements for scale development: reliability, unidimensionality and external validity. Each of these requirements is a complex concept in scale development that needs further explanation. The following section gives a recap of the scale development process, as discussed in the previous chapter, and the purpose that is served by achieving each of the three requirements. This is followed by the reliability analysis of the pilot data itself and the findings. A seven stage model to establish validity, using factor analysis, is then presented to show how unidimensionality and external validity can be achieved. These seven stages are then carried out on the pilot data and the findings presented along with explanations about how decisions and judgements made at each stage of the process were arrived at. First, an overview of reliability and validity testing and the role they play in scale development.

5.2.2 The Role of Reliability and Validity testing

Once a scale has been designed on paper, further development takes place during pilot testing where statistical tests are carried out to determine the reliability and the validity of the individual scales in a multidimensional scale. Reliability is essentially the internal consistency of a scale, that is, the extent to which each statement correlates with the rest, and how well it correlates, with the total item pool in the sub-

scale. Reliability is usually measured by the coefficient alpha using Cronbach's Alpha (Cronbach 1951;1991). The coefficient alpha is a measure of the combined coefficients between each statement and the next. All possible combinations are calculated and the coefficient alpha is a reflection of the strength or weakness of all these relationships combined. By analysing these statistics and comparing the results with what was intended in the original theoretical construction of the measure the researcher can then make judgements about which statements to retain and which to discard. However, high reliability is no guarantee that all the statements in a scale relate to one construct. A scale can be reliable but not valid, though it cannot be valid without also being reliable. For instance, a scale could have a high Cronbach's coefficient alpha score of say 0.85 but the underlying structure might reveal three separate components, in which case the coefficient alpha would need to be calculated for each of the three components.

To establish content validity (or face validity) a test should have statements that relate to dimensions clearly defined in the theoretical framework. Initial face validity involves tracing an operationalised dimension (and the groups of statements on a test related to it) back to the theoretical framework. From then on substantiation of content validity is an iterative process with evidence being accumulated through further studies.

Unidimensionality is also known as structurally or factorial validity (Comrey 1988), and is arrived at by analysing convergent validity through a process of factor analysis. Factor analysis provides evidence that respondents find statements in one dimension similar to each other (convergent validity) and enables the researcher to analyse the structure of the interrelationships (correlations) between many variables by defining a set of common underlying dimensions (factors) (Hair *et al.* 1998). According to Hair *et al.* (1998:90), "factor analysis is an interdependence technique in which all variables are simultaneously considered, each related to all the others." Factor analysis can be used in either an exploratory way or in a confirmatory way. Confirmatory factor analysis involves specifying a priori which statements should group together for each dimension. However, conventional or exploratory factor analysis allows the researcher to compare the groupings which emerge, with those

specified. This second conventional use of factor analysis was employed in the pilot study.

Finally, external validity, also known as criterion validity (DeVellis 1991), refers to the extent to which the dimensions relate to the attitudes/traits/competencies they are supposed to relate to in the real world. This can be established by using a sample of respondents known to display these attitudes, i.e. a predefined group. As the target population for the evaluation tool were young people still at school, it was unlikely that many would have already started their own business. Instead a predefined group of young people expressing their *intention* to start a business in their future career was identified through the use of questions on future careers in the demographic section of the questionnaire.

5.2.3 Sample size and Data Collection

There is no one generally agreed sample size for scale development, though a factor pattern that emerges from a larger sample is more stable than one generated from a small sample (DeVellis 1991). There is a range of recommended sample sizes from 300 (Nunnally and Bernstein 1994; Tinsley and Tinsley 1987) to 200, which is considered fair (Comrey 1988). Indeed, Thompson (2009) used a sample of 106 in a pilot study to develop a metric to measure individual entrepreneurial intent. The aim in this study, therefore, was to collect more than 200 cases. This number is required to carry out principal component analysis and develop the correlation matrix. The questionnaire was administered to young people aged 16-19 who took part in two YE Entrepreneurship Master classes in central London during 2002. A total of 212 questionnaires were completed altogether; however 16 of these were spoiled (e.g. whole pages missed out or not fully completed). Therefore, the remaining 196 were used in the statistical procedures to establish reliability and validity. It was decided that this sample size was close enough to the required 200 to make it acceptable. Furthermore a Kaiser-Meyer-Olkin (KMO) test can be carried out to measure sampling adequacy and the KMO should to be greater than 0.5 (Field 2004:444).

The researcher was present at each Master class and handed out questionnaires to participants as they arrived, and outlined the procedures for completing it.

Questionnaires were completed either prior to the commencement of the programme or during the breaks. The researcher was available to answer any queries and ensure questionnaires were completed correctly. Notes were taken on informal discussions with pupils during this process, which provided valuable feedback about the questionnaire and individual statements. Pupils were asked about the length of the questionnaire, to point out any words or phrases they did not understand, and for any other issues they wanted to raise about the statements.

The aim of these discussions was to obtain the views of young people on the suitability of the wording and content of the statements, and on the length of the questionnaire. They were asked to point out any ambiguous statements, any they did not understand and also any that they felt were inappropriate. This feedback was used during the process of validation and reliability testing to assist in the decisions about which statements to retain. If statements were only weakly correlated with other statements in a sub-scale then such feedback may be useful in explaining why.

The format of the day facilitated this process of obtaining feedback from pupils. There were approximately 220 pupils in attendance, divided into a dozen groups, each with a mentor. Mentors included Young Enterprise staff, entrepreneurs, business advisers, some corporate employees, and myself. The day comprised a series of group tasks, such as entrepreneurship games, creativity tasks, and networking. There was ample opportunity therefore for me to speak with most of the participants at some stage during the day, to seek their feedback on the questionnaire, either in groups or individually. Figure 5.2 provides some examples of the more negative kinds of feedback I received. In many cases the feedback was positive and pupils quite enjoyed completing the questionnaire, although there were many complaints about its length.

Altogether this experience was most instructive, and on reflection it would have improved the design of the evaluation tool no end, had it been carried out much earlier in the process. Pupils were often quite vocal in their response to the questionnaire and more than happy to provide criticism. It quickly became clear that the language used by me, and my colleagues, on occasion bore little resemblance to

that used by teenagers in London. This was an immediate and useful way of collecting feedback, if sometimes amusing, and on other occasions downright embarrassing. Several failings in the design of some of the items became evident, such as the use of overly negative language and images in an attempt to devise negative items to balance the very positive items. For instance, on the leadership construct and the creativity construct, the following had been included:

> "My class mates rarely take much notice of what I have to say."
> "I think I am one of the least imaginative people in my class" (Figure 5.2)

These were perceived by many pupils as rather insulting, and not a way in which they would be happy to describe themselves or others. It was therefore clear that these items were unlikely to successfully distinguish between pupils with and without enterprise potential. Another failing was the use of items with too many clauses. There were several examples of this, where it was evidently clear that pupils were confused and were unsure with which part of the sentence they were agreeing or disagreeing. Examples of this included:

> "I am likely to have a go at something new in class, even if I might make a fool of myself."
>
> "I don't like lessons where we are left on our own to get on with things." (Figure 5.2)

Finally, another limitation of some of the items was the use of inappropriate language more suited to an older generation, such as myself and my colleagues, than to London teenagers. Examples of these slang terms included: "brainwave", "driving force", "have a stab", and "plodding along". It now seems obvious that these were inappropriate, but inexperience and a limited research design led to their inclusion in the first pilot. The research design could have been much improved by carrying out focus groups with pupils of the target age prior to designing the evaluation tool, particularly defining the constructs and generating items. Nevertheless, that this engagement with young people was carried out, at least at this stage, provided

invaluable data, not to mention learning. It also highlights the importance of incorporating qualitative methods and data collection, to what has been a predominantly quantitative approach.

Figure 5.2 Summary of Feedback on Statements from Respondents

Construct	Statements	Comments
Leadership	My class mates rarely take much notice of what I have to say.	Depends on the situation. If it's something I'm good at then they'll listen to me. Very negative.
	If my class mates can't agree about what to do on a project then I don't get involved.	Confusing. What does this mean? Sounds negative. Don't understand the question.
	Teachers don't expect me to make many decisions.	This sounds rude. Too negative. It depends. Sometimes they do.
	I like to concentrate on my own responsibilities in projects.	Well of course you have to. It sounds strange. I don't understand what this is asking me.
Creativity	I can often find better ways of doing things in class.	I'd rather be doing something else. I prefer to do games. Doing what? What does it mean?
	I think I am one of the least imaginative people in my class.	That's just stupid. Who's going to say yes to that?
	I'm never the one to have a brainwave among my friends.	What's a brainwave? Is that like a microwave?
Personal Control	I don't like lessons where we are left on our own to get on with things.	Too long and confusing. What does it mean?
	I'd rather be late than turn up anywhere without my friends.	Well of course you should wait for your friends. Does that mean you shouldn't put your friends first?
Achievement	I'm usually the driving force among my friends.	What's a driving force? Don't understand the question.
	I'll probably spend my career plodding along quite happily.	What does plodding mean? Stupid question. That looks down on us.
Intuition	I'll have a stab at a solution to a problem rather than give up.	Too long and confusing. What does it mean?
	I like to know exactly where I stand with my friends.	Well of course you do, doesn't everyone? What's it really asking? That sounds like a trick question.
	I'm likely to have a go at something new in class even if I might make a fool of myself.	That's a strange question. It depends on what you mean.

5.3 Analysis of the Pilot Data

5.3.1 Testing the reliability of the evaluation tool

The first stage of the pilot study was to test the reliability and validity of the measure on a sample of young people still at school. The characteristics of the sample are shown in Table 5.1. There were 98 females and 98 males. Pupils were attending either a state school (102) or an independent (94) school. Exactly half the sample was female. (Table 5.1). As well as completing the ATE test respondents were also asked whether they had any future intentions towards starting their own business. Respondents were asked to indicate the likelihood of them being in a particular type or work, once they starting working, with a choice of five options:

- Working in a large organisation
- Working in a small business
- Have my own business or be self-employed
- Working in a profession (lawyer, solicitor doctor, teacher etc.)
- Be unemployed.

Respondents could indicate their intentions by ticking one of four options: very unlikely, unlikely, likely, very likely. This forced choice scale was used to enable identification of respondents into positive and negative categories. A total of 85 pupils stated that they were likely or very likely to have their own business, while 111 indicated that this was unlikely or very unlikely. These 'intentions towards starting a business' were used as the dependent variable during external validity testing of the instrument.

Table 5.1 Sample Profile (Pilot)

Characteristics	*Number (%) (N=196)*
Intentions to start a business in future	
Yes	85 43.4%
no	111 56.6%
Gender	
Male	98 50%
Female	98 50%
Type of school	
Independent	94 48%
State	102 52%

One aim of the reliability tests was to establish whether the five sub-scales representing the dimensions, which constitute enterprise potential in young people, were internally reliable. In calculating the reliability of the sub-scales it is assumed that:

i) the variation that is due to the latent variable is shared (common),

ii) the specific variation due to each item is unique, and finally

iii) the error variance is due to the unreliability of data collection or measurement error and is also not shared.

(Hair *et al.* 1998; Field 2004 and De Vellis 1991).

Scale reliability can then be explained as the proportion of variance attributable to the true score of the latent variable (common variance), and all the items vary jointly, or in other words they are correlated with each other (Field 2002). In other words, if the items on a scale have a strong relationship to their latent variable (underlying definition) then they will also have a strong relationship to each other (De Vellis 1991). Thus by calculating the common variance due to the latent variable it is possible to measure the level of correlation between the items on a sub-scale. Cronbach's Alpha is used test the internal consistency of a scale. In this study, 0.7 was used as the benchmark, therefore all sub-scales had to have a Cronbach Alpha of at least 0.7 (higher would be better) to be included in the final ATE test.

As a preliminary test Cronbach's Alphas were calculated for each sub-scale using all 18 items, the aim was to gain information about the reliability of the sub-scales. If they were below the threshold of 0.7 then this might provide enough evidence for the need to re-write some scales. Results showed that all the sub-scales achieved alphas greater than 0.7 except 'intuition (Table 5.2). The leadership scale had the highest alpha (0.860); 'creativity' was also high at 0.806; 'personal control' was 0.747, 'achievement was lower at 0.718; and 'intuition' was the lowest at 0.542. The alpha for the 'intuition' sub-scale was below the acceptable threshold of 0.7 and therefore this sub-scale would need to be re-designed for the main stage study. Further investigation to establish the validity of these scales, using factor analysis, was carried out to either confirm or refute these findings.

Table 5.2 Cronbach's Alpha Scores for Sub-scales (N=196)

Construct	*Number of items*	*Cronbach coefficient alpha*
Self-perceptions of ability to lead others.	18	0.879
Perceptions of creativity	18	0.806
Achievement orientation	18	0.718
Perceived personal control	18	0.747
Intuition	18	0.542

According to DeVellis (1991:88) statements that contribute least to the overall reliability of a scale should be considered first for elimination. Statistics alone, however, such as Cronbach's coefficient Alpha scores should not drive the choice of which items to eliminate from a scale (Smith 1999). These decisions are made by the researcher taking into account the specification of the domain of the scale, and any feedback available from the target population. In this case informal discussions with young people provided feedback on statements they found ambiguous or incomprehensible. Reliability testing is only one tool in the development of new scales, however, and factor analysis is another common tool used to develop scales. To further aid the development of this new scale, therefore, factor analysis using principal component analysis was carried out. As was demonstrated in Chapter Four this technique is increasingly being used in entrepreneurship research following a long history of use in personality psychology and in marketing. Factor analysis is used to investigate the structural validity of scales, that is the underlying structure,

which should reflect the conceptual design based on previous theoretical dimensions (of, in this case, enterprise potential).

5.4 Testing the Validity of the Evaluation Tool

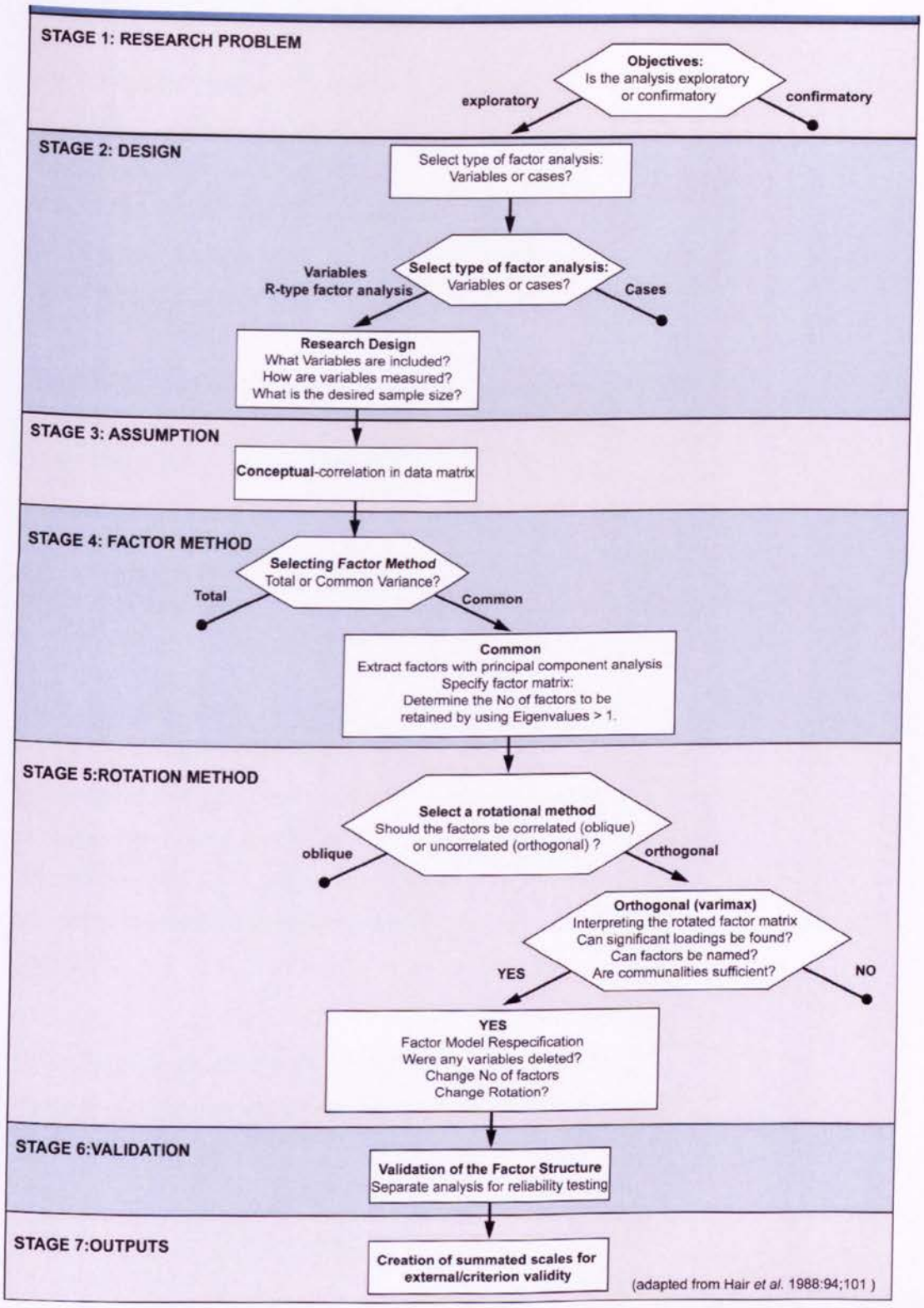
As with reliability testing there are accepted procedures and benchmarks when carrying out factor analysis, and these were adhered to in this study (e.g. Field 2004; Hair *et al.* 1998; DeVellis 1991; Churchill 1979). The purpose of this section is outline what these accepted procedures and benchmarks are, and how they were actually carried out in this pilot study.

Hair *et al.*'s (1998) seven stage decision diagram for factor analysis was adapted and used as a guide for carrying out these procedures in this study (Figure 5.3). The seven stages are:

1. Research Problem
2. Research Design
3. Assumptions
4. Factor Method
5. Rotation Method
6. Validation of the Factor Structure
7. External Validation of the Scale

All of the seven stages in this decision diagram closely resemble those presented by Hair *et al.* (1998). The main difference is in stage seven where Hair *et al.* (1998) indicate that the process can either be terminated or further analysis such as reliability testing using Cronbach's coefficient alphas can be carried out. In this study stage seven is used to carry out external validation of the scale using a pre-defined group and a control group. The following sections outline each of these stages and the approach taken in this study. In the section on stage six, validation of the factor structure, the outcome of the factor analysis process is presented, along with results of the statistical tests, and the interpretation given to these results. The decisions made, based on these interpretations are then explained.

Figure 5.3 Factor Analysis Seven Stage Decision Diagram



5.4.1 Stage One: Research Problem

Factor analysis can be used in either an exploratory or a confirmatory analysis for data reduction and identifying structure through data summarization. In this case the aim was to identify the underlying structure of the scale through the identification of the sub-scales. When the sub-scales are grounded in predefined theoretical dimensions using a confirmatory approach can be justified. Whereas in a confirmatory factor analysis the factors are predefined and each sub-scale is analysed separately, in an exploratory factor analysis all statements are analysed in the same process. As this study had developed a completely new scale, it was decided to treat the factor analysis process as exploratory. This approach has been adopted in previous studies involved in the design of new scales (e.g. Carland *et al.* 2001). Moreover, such an approach would confer legitimacy through statistical techniques of the validity of the underlying dimensions and the newly created scale (DeVellis 1991).

Churchill (1979) recommends using a domain sampling model as the most logically defensible measurement model, which involves using some, not all, of the original statements. In this case all 90 statements were submitted to factor analysis, and following the domain sampling model, only a proportion of these were included in the final measure (Nunnally and Bernstein 1994). The aim of developing a scale is to achieve the most parsimonious solution (in this case the shortest potential scale with the greatest reliability and validity), and have statements that load (i.e. correlate with) onto one factor, which is taken to represent the underlying dimension of the sub-scale. In this context the underlying theoretical dimension (creativity; leadership etc.) is referred to as the 'latent variable' (DeVellis 1991). The latent variable is regarded as the *cause* of the item score (Likert scale responses) – the value of its true score is presumed to cause a statement to take on a certain value (DeVellis 1991). In this way the scores a person obtains (the sum of all statements on a Likert scale from 1 to 5 relating to that dimension) will be taken as a proxy for the strength of that latent variable, or, in this case, attitude. Having decided on an exploratory analysis the next step is to decide what to include in the factor analysis. Sample size needs to be decided, and how the variables will be measured. This is the subject of stage two in the decision tree.

5.4.2 Stage Two: Research Design

Factor analysis can identify relationships between either variables or cases. In this case relationships between variables (statements) were sought. Factor analysis identifies the underlying structure of relationships between statements by calculating the correlations between each statement and all the other statements in the scale. This is referred to as *R* factor analysis. The matrix is called and *R*-matrix or *R*, because it contains correlation coefficients and *R* usually denotes Pearson's correlations. (Field 2004). What factor analysis does is to calculate the correlation coefficients for each pair of variables by creating an *R* matrix. Hair *et al.* (1998) recommend a minimum of five variables per factor and so 18 items per sub-scale exceeded this criterion. Likert scale responses by respondents served as the measurements for each statement (relationships between these measurements will denote the existence of factors). Finally, sample size needs to be addressed. The summary given above of recommended sample sizes for scale development showed that these range from 100 to 300 and above. Hair *et al.* (1998) recommend a sample size of at least 200 for factor loadings of 0.4 for variables on each dimension. The sample of 196 in this pilot study, was therefore considered to be adequate for factor analysis to be carried out, provided variables had factor loadings of at least 0.4.

5.4.3 Stage Three: Assumptions

According to Hair *et al.* (1998) conceptual assumptions as well as statistical assumptions are important in factor analysis. Conceptual assumptions concern the face validity of statements and how well they relate to the original definition of the construct. The statistical assumptions include the KMO and Bartlett's test of sphericity. A KMO test of sampling adequacy was carried out. The KMO varies between 0 and 1 and a value of greater than 0.5 indicates that patterns of correlations are relatively compact and therefore factor analysis should reveal distinct and reliable factors (Field, 2004). Bartlett's measure of sphericity tests the null hypothesis that the original correlation matrix is an identity matrix, which implies that all the correlation coefficients would be 0, which is clearly undesirable. The Bartlett test should have a significance value of less than 0.5 (Field 2004). In fact the significance of the Bartlett test at $p=0.02$ indicates that there are some

relationships between the variables, and so factor analysis is appropriate. Hair *et al.* (1998) recommend visual inspection of the correlation matrix, which should identify a substantial number of correlations greater than .40. This test was carried also out and a substantial number of these correlations were identified. The statistical assumptions were, therefore, satisfied.

5.4.4 Stage Four: Factor Method

There are two different methods which can be used in factor analysis depending on what type of variance is to be analysed: common factor analysis or principal component analysis. Common factor analysis only analyses common variance, and, therefore, would add little to the reliability analysis already undertaken using Cronbach's coefficient alpha. By contrast principal component analysis investigates total variance between statements, which includes common variance and small proportions of specific variance. According to Hair *et al.* (1998), however, the factors extracted with principal component analysis are more stable than those extracted with common factor analysis and furthermore the main factors first extracted do not contain sufficient proportions of specific or error variance to distort the factor structure. By analysing the total variance, principal component analysis can establish which linear components exist within the data and the extent to which each statement contributes to that component (factor) (Field 2004). It was, therefore, decided to use principal component analysis in this analysis.

The next decision about the factor method is how to determine which factors to retain. The most commonly used criterion is the eigenvalue or latent root criterion. The eigenvalue is the sum of squared loadings for a factor, which represents the amount of variance accounted for by a factor. Following commonly accepted procedure, eigenvalues greater than 1 will be retained (Hair *et al.* 1998).

5.4.5 Stage Five: Rotation Method

Stage five of the factor analysis process is concerned with interpreting the factors and the selection of the final factor solution. Factor loadings are the correlation of

each variable and the factor or component, and the higher the value of the loading the greater the correlation with the factor. To determine whether a factor loading is significant the sample size is taken into account. Hair *et al.* (1998) recommend factor loadings of at least 0.40 for a sample of 200 and, therefore, this was used as the criteria in this study.

Generally, most variables have high loadings on the most important factor and small loadings on other factors, which can make it difficult to determine the existence of different factors. Rotation of factors is used to extract a more meaningful factor pattern by redistributing the variance more evenly across all factors rather than mainly on one factor, which is the case with the unrotated factor solution (Hair *et al.* 1998). In this way the loading of each variable on the main factors is maximized, whilst its loading on other factors is minimized. This is achieved by rotating the reference axes of the factors around the origin until some other solution is found. Rotation can be either orthogonal or oblique.

In an orthogonal rotation the axes are rotated, while being maintained at 90 degrees, which secures the independence of the factors which are assumed to be unrelated. If factors are expected to be related, however, then an oblique rotation would be carried out. In an oblique rotation axes are not maintained at 90 degrees thus allowing correlation between the factors. In this study it was anticipated that the factors (representing the theoretical dimensions) would be uncorrelated and therefore an orthogonal rotation, the varimax rotation, was selected. For instance, Stormer *et al.* (1999) found that though some of the subscales of the GET test were correlated the subscales were relatively independent of one another to warrant use of a varimax (orthogonal) rotation.

5.4.6 Stage Six: Validation of the Factor Structure

The aim of the principal component analysis is to develop a factor structure where discrete factors emerge with all statements loading only on one factor. This is achieved by eliminating statements that have a loading or more than .40 on more than one factor. To aid decisions about which statements to eliminate findings from the feedback from young people about which statements they felt were ambiguous

or confusing were also taken into account. These decisions must also be taken in the light of the original definition of the construct. It is important to retain statements that reflect this original definition. The optimum factor solution is achieved by an iterative process of eliminating statements and re-calculating the principal component analysis, until a satisfactory solution is found. Once the optimum factor structure is achieved, then the reliability of each resulting sub-scale should be re-checked to confirm the extent of internally reliability of each scale. At stage seven the summated scales are subjected to external validity testing to determine whether the tool can distinguish between young people with aspirations to own their own business and those without such aspirations. First, the actual procedures discussed so far are carried out.

A principal component analysis was carried out using a varimax (orthogonal) rotation and initially all 90 items were submitted. Only factors with eigenvalues greater than 1 were extracted, and only statements loading over .40 were displayed. The unrotated solution showed that 26 components had been extracted but there were a number of statements which loaded onto more than one dimension, and the first component included 43 statements. The aim of rotating the analysis is to more evenly distribute the statements among the components by rotating the factor axes clockwise through the clusters and to simplify the rows and columns of the factor matrix to facilitate interpretation (Hair *et al.* 1998).

Five components were identified that could be related to the theoretical dimensions underlying the sub-scales. These components contained a total of 33 statements, and together these components accounted for only 33.9% of the variance, which is quite a small proportion. The key components of a scale in the field of social sciences would be expected to account for around 60 *per cent* of the variance (DeVellis 1991: 87). The next version of the tool will therefore need to retain the most useful statements, which reflect the original definition and create some3additional statements. The following sections outline the findings for each separate construct. In addition to the statistical tests decisions about which statements to retain were also informed by feedback from respondents at the time the questionnaire was administered. This feedback was collected in note form by

the researcher and a summary showing some of the comments is provided in Figure 5.2, as previously discussed.

5.4.6.1 Leadership

The leadership component had a total of 17 statements with value loadings greater than 0.40 (Table 5.4). The eigenvalue was high at 14.660 and this component accounted for 16.3 *per cent* of the variance, which indicates that this scale has strong structural validity and should be retained. However, not all of the statements included were designed for the leadership scale. There were also two statements from the personal control scale and three statements from the achievement scale which loaded onto this component. Looking at these in Table 5.3 it is clear that in fact there is some overlap in the meaning of these statements, with the meanings of the leadership statements. They are concerned with taking responsibility, decision making, and taking control of a situation. These statements were therefore eliminated from the leadership scale because of this overlap and confusion in meanings. Instead they will be retained in their original scales and subjected to a review. For instance they may need to be re-worded to make the original meanings clearer.

Only 11 statements from the leadership sub-scale were correlated with each other and loaded on to one factor. The remaining nine statements were distributed throughout the other 25 components with no meaningful patterns emerging. Two of these were negative statements;

> 'My class mates rarely take much notice of what I have to say."
>
> 'If my class mates can't agree about what to do on a project then I don't get involved.'

Hair *et al.* (1998) do not recommend the use of negative statements such as these, because of the need to reverse the scores and the ambiguity for some respondents and the potential problems these may cause. Though the scores were reversed it's clear that respondents found them ambiguous. The informal feedback received from participants in the YE Master Classes, who completed the questionnaire, indicated

that they found these statements vague and disliked the negativity they expressed (Figure 5.2). It was decided to retain the 11 leadership statements which were included in the first component for a further principal component analysis, and to discard the two negative statements.

Table 5.3 Rotated Component Matrix

Component	***Statements***	***Factor loading***	***Eigenvalues***	***Percentage of variance extracted***
Leadership	I like making decisions for a whole group of us.	.755	14.660	16.289%
	I usually take the initiative in any project I am involved in.	.716		
	I think I can easily carry my classmates with me when I have an idea.	.685		
	I can usually convince my classmates to do things my way.	.682		
	I like taking the lead in projects at school.	.635		
	I enjoy talking the class round to my point of view.	.560		
	When we do a school project I'm always there at the centre of things.	.534		
	I prefer to let another classmate take the lead.	.525		
	I'm good at motivating my classmates.	.523		
	I enjoy taking on responsibility in the classroom.	.515		
	My friends are happy for me to make the decisions.	.513		
	Class mates expect me to have an answer for everything.	.442		
	Additional statements from other dimensions			
	I enjoy having to make decisions about things in class. (Personal control)			
	There is always someone else willing to take responsibility. (Achievement)	.503		
	I'm usually the driving force among my friends. (Achievement)	.502		
	If I'm not happy about something at school I tell someone who can do something about it. (Personal control)	.486		
	I like to have a role at the margins of a project. (Achievement)	.430		
		.406		
Creativity	I believe that a good imagination helps you do well at school.	.725	4.627	5.141%
	I think that being creative is an advantage at school.	.716		
	I like lessons that really stretch my imagination.	.575		
	I enjoy lessons where the teacher tries out different ways of teaching.	.557		
	I believe that teachers over-rate the importance of creativity and imagination.	.502		

Personal Control	I like to get on with things in class rather than be taken through step-by-step by the teacher. I prefer to figure things out on my own than rely on a teacher to explain. I usually get on with things in class rather than wait for everyone else. I don't like lessons where we are left on our own to get on with things. ***Additional statements from other dimensions*** I can often find better ways of doing things in class. (creativity)	.796 .670 .653 .532 .447	3.848	4.276%
Achievement ONE	I like to get things finished properly in class. Once I've started something in class I like to see it right through to the end. ***Additional statements from other dimensions*** If I don't know the answer to something, then Ill have a guess. (Intuition) I prefer to choose my own topics for projects rather than being given a topic. (Creativity)	.763 .633 .427 .417	3.115	3.461%
Acheivement Two	I have a lot more energy than most people at school. Other people look to me to get a project off the ground. ***Additional statements from other dimensions*** I'm likely to have a go at something new in class even if I might make a fool of myself. (Intuition)	.647 .516 .660	2.835	3.150%

5.4.6.2 Creativity

On the 'creativity' scale there were five statements which were correlated with each other and loaded onto one discrete component. The eigenvalue for this component was 4.627, which though not as high as that for the leadership component, was still above the threshold of 1. The other 13 statements from this scale were distributed throughout a number of other components, however no meaningful pattern could be discerned. These statements were critically evaluated to assess their relevance to the overall domain of creativity, any redundancy of items and any ambiguity reported by young people. One statement actually loaded onto the personal control component:

"I can often find better ways of doing things in class."

This statement was intended to capture the behaviour of a creative person. It was anticipated that a creative pupil is someone who comes up with alternative and better solutions for carrying out tasks in the classroom. However, this statement could also reflect the desire of a pupil for greater personal control in carrying out tasks. Feedback from pupils indicated that they had misunderstood this statement and focused on the idea of doing something they liked rather than a class they didn't like (Table 5.3). The ambiguity of this statement makes it unsuitable for inclusion in a further analysis and, therefore, it was discarded.

5.4.6.3 Personal control

The factor analysis process extracted four statements on the personal control component which loaded onto one factor and were therefore correlated with each other. This component had an eigenvalue of 3.848 and accounted for 4.276 of the variance. The remaining 14 statements loaded onto other factors, some of which were comprised of only one or two components, with eigenvalues of less than 1. These statements will be evaluated to determine which contribute to the overall meaning of the dimension and should be included in a further analysis. This assessment showed that the four statements that were correlated with each other were in fact the closest to the meaning intended for the personal control dimension. This dimension was intended to identify a pupil who could work on their own, and did

not always need guidance from teachers or classmates. Some of the remaining statements failed to capture this meaning adequately, and were criticised by pupils. Two statements illustrate the ambiguity that was revealed by feedback from pupils:

A. My grades depend entirely on how good my teachers are.'
B. I'd rather be late than turn up anywhere without my friends.'

Young people at the YE Master class remarked that statement B was about 'loyalty' to their friends and not about independence as was intended. They also made the point that 'good teachers' can make all the difference to exam results and that statement A is therefore not related to personal control. These two statements were therefore not retained and it was decided to retain only the four statements that were inter-correlated for inclusion in a further principal component analysis.

5.4.6.4 Achievement

Statements on the 'achievement' scale clustered together less well. Altogether two components were extracted relating to achievement. There was one component with two achievement items clustered together along with two additional items, one from the intuition scale and one from the creativity scale (Achievement ONE Table 5.5). The other component had two items from the achievement scale, and one from the intuition scale (Achievement TWO Table 5.3). Furthermore, three statements from the achievement scale in fact loaded onto the leadership scale:

"There is always someone else willing to take responsibility. "
"I'm usually the driving force among my friends."
"I like to have a role at the margins of a project."

The achievement scale was intended to identify pupils with goals, who enjoy completing projects well, and who have more energy than their classmates. More energy translates into being able to see things through and finishing off projects well. On reflection this definition is vague compared with 'leadership' skills or 'creativity' and is comprised of different themes rather than one strong theme. It was decided to retain the statements that correlated together on the two achievement

components and to also retain the three statements that loaded onto the leadership scale and review this scale for the second pilot study.

5.4.6.5 Intuition

It may be recalled that the "intuition" scale was not internally reliable and the Cronbach's alpha was 0.542, which is below the desired threshold of 0.7 (Figure 5.1). This lack of internal reliability was reflected in the factor structure of this sub-scale. None of the statements on the 'intuition' scale clustered together to form one discrete component, but were dispersed throughout several components, some with only one or two items loading on them. None had an eigenvalue greater than 1, and no meaningful pattern emerged from the groupings. This demonstrates that the statements designed to measure intuition were not actually loading onto a latent variable based on the original theoretical dimension. Either the statements were badly worded or the domain of 'intuition' was not accurately specified. A combination of both was the more likely explanation, because if the domain was not adequately defined then the process of generating statements would be unclear resulting in vague ill defined statements. It was, therefore, decided to drop this dimension from the rest of the analysis, and instead to redefine the dimension for the second pilot study.

Unidimensionality is one of the criteria for scale development identified in Chapter Four. Some of the intuition statements, however loaded onto more than one dimension, which shows that in its current state the intuition scale is not unidimensional. Nevertheless, a factor structure was emerging for the remaining dimensions, particularly leadership, creativity, and personal control, all of which *were* unidimensional. The achievement scale was not unidimensional though, and had in fact two factors. Further development of all the scales was needed therefore, to achieve a more satisfactory factor structure. To facilitate this, a further principal component analysis was carried out using a reduced number of 34 statements. These 34 statements represent those statements that best loaded onto the four remaining constructs (leadership, creativity, personal control and achievement), as identified through the foregoing process.

5.5 Iteration of the Principal Component Procedure

A new principal component analysis (PCA) was, therefore, carried out using all 34 statements that were identified as correlating with the four meaningful components that were extracted in the first PCA, apart from the intuition statements. Statements were retained for each of the four remaining sub-scales, which were closest in meaning to the original definitions given for each construct. A principal component analysis with a varimax rotation was carried out, and the results of this analysis are shown in Table 5.4.

On this occasion six components were extracted: two leadership, one personal control, one creativity, and two achievement components. These components combined, accounted for 55.7 *per cent* of the total variance, which is an improvement on the previous analysis, however, there were still several statements that loaded onto more than one component. Furthermore, neither the leadership nor the achievement scales proved to be unidimensional on this occasion, which is a required condition of scale development. Therefore, it was decided that further PCAs would need to be carried.

According to Hair *et al.* (1998) selecting the number of factors depends on several considerations: the latent root criterion (eigenvalue), rotation, and assessment of structure, that is interpreting the factors in the context of the theoretical origins of each factor (dimension). In other words, the findings of the statistical calculations such as principal component analysis help to identify how statements are correlated and in what groupings they occur. However, these statistics should not drive the selection of which statements to retain (Smith 1999). Instead consideration needs to be given to the underlying definitions of the construct and how well each statement reflects this definition. Hair *et al.* (1998) recommend that several iterations are needed before a well defined structure is achieved that accurately reflects the meaning intended by the definition.

Table 5.4 Second Rotated Component Matrix

Component	***Statements***	***Factor loading***	***Eigenvalues***	***Percentage of variance extracted***
Leadership (1)	I enjoy taking on responsibility in the classroom.	.752	7.859	25.351%
	I like taking the lead in projects at school.	.751		
	I'm good at motivating my classmates.	.643		
	I enjoy talking the class round to my point of view.	.642		
	I prefer to let another classmate take the lead.	.552		
	I usually take the initiative in any project I am involved in. *	.546		
Leadership (2)	When we do a project I'm always there at the centre of things.	.526	2.341	7.552%
	I like making decisions for a whole group of us. *			
	I think I can easily carry my classmates with me when I have an idea.*			
	I can usually convince my classmates to do things my way.	.728		
	My friends are happy for me to make the decisions.	.714		
	I like making decisions for a whole group of us. *	.541		
	I think I can easily carry my classmates with me when I have an idea.*	.495		
	I usually take the initiative in any project I am involved in. *	.474		
	I'm usually the driving force among my friends. (Achievement)	.410		
	If I'm not happy about something at school I tell someone who can do something about it. (Personal control)	.402		
	* These statements load onto Leadership (1 and 2)			
Personal Control	I like to get on with things in class rather than be taken through step-by-step by the teacher.	.807	2.899	9.352
	I usually get on with things in class rather than wait for everyone else.	.684		
	I prefer to figure things out on my own than rely on a teacher to explain.	.655		
	I don't like lessons where we are left on our own to get on with things.	.611		

Creativity	I believe that a good imagination helps you do well at school. I think that being creative is an advantage at school. I enjoy lessons where the teacher tries out different ways of teaching. I like lessons that really stretch my imagination. I believe that teachers over-rate the importance of creativity and imagination.	.830 .688 .669 .478 .412	1.549	4.996%
Achievement ONE	I like to get things finished properly in class. Once I've started something in class I like to see it right through to the end. ***Additional statements from other dimensions*** I prefer to choose my own topics for projects rather than being given a topic. (Creativity) I enjoy having to make decisions about things in class (personal control)	.836 .624 .464 .402	1.340	4.323%
Achievement TWO	I have a lot more energy than most people at school. There is always someone else willing to take responsibility. I'm usually the driving force among my friends. Other people look to me to get a project off the ground. ***Additional statements from other dimensions*** Class mates expect me to have an answer for everything (Leadership)	.726 .615 .559 .502 .477	1.291	4.163%

At this stage the initial criteria for the significance of factor loadings (0.40) was re-examined to aid development of the factor structure. A minimum criterion is 0.30, which can be used, but in the previous analysis only factor loadings of 0.40 were treated as acceptable. Factor loadings of .50 or greater are in fact considered to be practically significant (Hair *et al.* 1998) and, therefore, as many of the statements that loaded onto more than one component had relatively low loadings (less than 0.5) it was decided to exclude factor loadings of less than 0.5. Furthermore, statements that loaded onto more than one component were also considered for exclusion. A further four PCAs were carried out before a solution emerged in which the components were all unidimensional and statements loaded onto only one component.

During this process statements were retained or discarded only when there were good theoretical foundations for doing so, that is, statements either did or did not contribute to the definitions of the scales developed in the theoretical model. Likewise statements were retained even if the statistical results indicated that they were weakly correlated with the rest, if they captured the meaning of the underlying construct. For instance, in the leadership scale the statement "When we do a school project I'm always there at the centre of things" had a factor loading of 0.54 which was much lower than the other retained statements, so on statistical grounds could have been discarded (Table 5.5). However, it was decided to retain this statement, as it nicely captured the idea of someone who was at the centre of group projects, implying a pivotal role. This is precisely what the construct of leadership was designed to reflect.

Table 5.6 shows the final factor structure of four components that was achieved through an iterative process of calculating PCAs and retaining or discarding statements which contributed to the definitions of each dimension. The four components account for a total of 56.3 *per cent* of the variance, which is respectable for a pilot study. The tri-partite model of attitudes was used as a basis for generating statements that referred to either, affective, cognitive or behavioural attitudes towards the dimension in question. As can be seen from Table 5.6 a combination of different types of attitudes are reflected in the retained statements.

The original model of each scale incorporated 6 statements designed to reflect each of these three aspects attitudes:

- Beliefs (cognitive)
- Emotions/feelings (affective)
- Behaviours (behavioural)

In fact, this model structure was not confirmed by the principal component analysis and instead a mixture of statements from each of the three aspects of attitudes were retained in the final version.

There were six statements from the leadership dimension, which clearly all relate to leadership skills. This component has an eigenvalue of 4.717 and accounts for 26.2 *per cent* of the variance, making it a strong dimension structurally. The statements refer to taking responsibility, persuasion, and taking a lead in project work. The creativity scale contains four statements and has an eigenvalue of 2.221 and accounts for 12.3 *per cent* of the variance. These statements are designed to assess how important respondents think creativity and imagination are at school, and how much they enjoy taking part in creative activities.

The personal control component also has four statements, and an eigenvalue of 1.961. This component accounts for 10.9 *per cent* of the variance. The statements retained in this component all refer to independence and working on one's own, which reflects the original definition of the "personal control" dimension. Finally, it was possible, through this iterative process to obtain a unidimensional scale for the achievement dimension, though this scale was less strong structurally than the other scales. This component had an eigenvalue of 1.245 and accounted for just 6.9 *per cent* of the variance. The statements in this scale are designed to identify energetic pupils who can get things done, which is an accurate representation of the original definition of the "achievement" dimension.

Table 5.5 Final Rotated Component Matrix

Component	Statements	Factor Loadings	Eigenvalue	Percentage of Variance
Leadership	I enjoy talking the class round to my point of view. (A) I enjoy taking on responsibility in the classroom. (A) I like taking the lead in projects at school. (A) I think I can easily carry my classmates with me when I have an idea. (C) I usually take the initiative in any project I am involved in. (B) When we do a school project I'm always there at the centre of things. (B)	.736 .734 .707 .683 .650 .540	4.717	26.204%
Creativity	I believe a good imagination helps you do well at school. (C) I think that being creative is an advantage at school. (C) I enjoy lessons where the teacher tries out different ways of teaching. (A) I like lessons that really stretch my imagination. (A)	.828 .728 .713 .688	2.221	12.341%
Personal control	I like to get on with things in class rather than be taken through step by step by the teacher. (A) I usually get on with things in class rather than wait for everyone else. (B) I prefer to figure things out on my own rather than rely on a teacher to explain.(A) I don't like lessons where we are left on our own to get with things. (A)	.847 .697 .645 .635	1.961	10.897%
Achievement	I have a lot more energy than most people. (B) Other people look to me to get a project off the ground. (B) I'm usually the driving force among my friends. (B) I like to have a role at the margins of a project. (A)	.795 .705 .651 .574	1.245	6.919%
				Total variance = 56.361%

A = affective, B = Behavioural, C - Cognitive

Stage Six in the factor analysis process also involves validating the factor structure by establishing the internal consistency and reliability of the sub-scales. To do this it was necessary to re-test the extent of the reliability of the retained factors by examining the internal reliability of each factor and how well statements in each factor were correlated to each other and to the total statement pool. This was achieved by calculating Cronbach's Alphas for the remaining statements in each sub-scale. All four specifications of the re-calibrated sub-scales exceeded the threshold of 0.7 for the Cronbach coefficient Alpha (Table 5.6). The 'leadership' scale had the highest alpha (0.815), which reflects the strong structural validity of this scale, and 'creativity' was also high at 0.750. The internal reliability for the 'Achievement' and 'personal control' were also acceptable at 0.703 and 0.702 respectively.

Table 5.6 Cronbach's Alpha Scores for Final Sub-scales (N=196)

Dimension	*Number of items*	*Cronbach coefficient alpha*
Self-perceptions of ability to lead others.	6	0.815
Perceptions of creativity	4	0.750
Achievement orientation	4	0.703
Perceived personal control	4	0.702

5.6 Stage Seven: External/criterion Validity Testing

In Stage Seven, outputs of the newly created scale are produced for subsequent analysis. In this case the outputs, summated scales, were used to establish the external or criterion validity of the ATE test. External/criterion validity aims to test whether a scale measures what it was intended to measure; in this case 'enterprise potential' in young people.

Summated scales are formed by combining several items that load highly on one component to produce a composite measure (Hair *et al.* 1998). For the leadership, creativity personal control, and achievement sub-scales the statements in the final principal component analysis (Table 5.6) were used as

the basis for composite measures. This final validation stage involves external validation of the whole multi-dimensional scale. There are a number of different ways of testing validity, one of the most common being criterion validity (DeVellis 1991). For criterion validity the scale must be capable of distinguishing between a predefined group who would be expected to score significantly higher on the scale than a control group. The predefined group in this case were pupils who expressed future intentions to run their own business. It was anticipated that they would display stronger attitudes towards the dimensions associated with enterprise potential than pupils with no such intentions. The following sections explain, and present the findings of the bivariate analysis that was undertaken to establish external validity.

Following reliability and structural validity testing an initial test of criterion validity (or external validity) was performed on the pilot data. A dependent variable was developed to use in the validity test, which was a proxy for pupils' future intentions towards founding a business. Obviously such an approach has limitations as it measures intentions rather than actual entrepreneurial behaviour (starting a business). However, it was considered to be a reasonable approach to use intentions for this pilot study, as young people in the sample were still at school, and therefore unlikely to have started their own business.

Respondents were asked to indicate how likely or unlikely they were to pursue any of *five career options (including working in a large firm, a small firm,* working as a professional (e.g. lawyer, doctor) being unemployed as well as starting a business). For the purposes of validity testing 'future intentions towards business founding' was operationalised as follows: If respondents indicated they were likely or very likely to start their own business they were then categorised as future business-owners. If respondents indicated they were unlikely or very unlikely to start their own business they were put into the control group. *In effect a binary variable was designed* to enable the validity testing to be carried out. There were 85 respondents with aspirations to found their own business in the future and 111 respondents with no such aspirations (Table 5.7).

Table 5.7 Pilot One Sample by Intentions to start a business

Intention to start a Business	Number	Percent
Yes	85	43.4
No	111	56.6
Total	196	100.0

To explore differences between the future business owners and the control group a series of T-Tests were calculated using average scores achieved on the sub-scales for each group. Average scores were calculated by first summing scores of all statements in each reliable sub-scale (leadership, creativity, achievement, and personal control). The sub-scale measuring 'intuition' was not reliable and was, therefore, omitted from this stage of the analysis. A total ATE test score was then calculated by summing sub-scale scores for each respondent. The average ATE test scores for the future business owners group and the control group were then compared using a T-test.

Table 5.8 displays the probabilities that the mean differences between the business owners group and the control group were significant. In fact the average score for the future business owners group on the total ATE test score was significantly greater than the average scores for the control group. The average score for the future business owners group was 68.60, out of a maximum of 90, whereas the average score for the control group was 64.16. The future business owner group also scored higher than the control group for each separate sub-scale, and the difference in average scores was greatest and significant for the sub-scale measuring leadership. The average score for the business group for the leadership sub-scale was 21.60, (maximum = 30), and the average score for the control group was 20.14.

Table 5.8 Mean scores for Future Business Owners and Control Group

	Groups	Number	Mean	Std. Deviation	Significance (2-tailed)[11]
Total ATE scores	Business	85	68.60	9.96	0.006*
Max score = 90	Control	111	64.16	8.26	
Leadership	Business	85	21.60	4.15	0.013*
Max score = 30	Control	111	20.14	4.35	
Creativity	Business	85	15.88	2.75	0.125
Max score = 20	Control	111	15.25	2.89	
Achievement	Business	85	16.35	3.51	0.900
Max score-20	Control	111	16.14	3.31	
Personal control	Business	85	14.29	2.70	0.111
Max score = 20	Control	111	13.51	2.63	

* significant at the 0.05 level

If the dependent variable, i.e. ATE test scores, is taken to represent a reasonably accurate measure of pupils' future intentions towards founding a business then this analysis has gone someway towards establishing the validity of the ATE test. The implications of these findings are that the ATE test can successfully distinguish between pupils with intentions to found a business "future business owners", from pupils who do not have these intentions.

A final measure of validation, was also carried out, namely concurrent validity. According to Churchill (1979) and subsequent researchers (e.g. Hair *et al.* (1998:118) a scientific method for establishing the validity of a new measure is the extent to which it correlates with other similar measures (convergent validity) and the extent to which it can be discriminated from other measures (discriminant validity). Discriminant validity proves that the measure is indeed testing different (new) constructs.

To test the validity of the measure a similar already published measure, based on the Protestant Work Ethic scale, was used. The similarities between the

[11] probabilities of significance using T-test analysis (expressed as p scores)

achievement' ethic of entrepreneurs and the Protestant work ethic led to the choice of the latter to test the validity of the ATE test (Bonnett and Furnham 1991, Furnham 1990). A short 6-item test designed to measure 'work ethic, and with language easily understood by 16-19 year olds was selected (Warr, Cook and Wall 1979). The test included the following statements:

- Even if I won a great deal of money on the lottery I would continue to work.
- If unemployment benefit was really high I would still prefer to work.
- I would hate to live off benefits.
- Having a job is very important to me.
- The most important things that happen to me involve work.
- I would soon get very bored if I had no work to do.

An EFA showed that the PWE test was unidimensional and the Cronbach Alpha score that it was internally reliable at 0.700.

To establish discriminant validity the measure of Average Variance Extracted (AVE) (Fornell and Larcker 1981) was used. A correlation matrix was calculated for the four ATE constructs: personal control; achievement; leadership; and creativity, and the Protestant work ethic scale (Table 5.9). For discriminant validity to be established a construct's AVE should be greater than 0.50 and the square root of the AVE higher than the corresponding bivariate correlation. Both these criteria were met demonstrating that the four constructs were in fact measuring different constructs than that represented by the PWE. It also showed that the creativity sub-scale was negatively correlated with the PWE, and therefore was measuring a completely different construct.

Table 5.9 Discriminant validity of sub-scales and the PWE scale (N=196)

Sub-scale					
	PC	*ACH*	*LEAD*	*CREATE*	*PWE*
Perceived personal control (PC)	0.714*				
Achievement orientation (ACH)	.4094	0.751*			
Self-perceptions of ability to lead others (LEAD)	.4313	.5524	0.758*		
Perceptions of creativity (CREATE)	.1375	.2814	.2110	0.849*	
Protestant work ethic (PWE)	.3251	.4838	.4001	-0.002	0.515*

*$\sqrt{}$ of the average variance extracted (AVE).

5.7 Summary of Pilot Study

There are several underlying assumptions and essential requirements which need to be met when developing completely new scales, which were outlined in Chapter Four. These requirements or criteria are well established procedures in psychology and marketing research studies. As the review of studies using scales to measure entrepreneurship showed, these methods are also increasingly being used in entrepreneurship research. The three main requirements are internal reliability, structural validity or unidimensionality, and finally external validity. The purpose of the pilot study was to develop the ATE test by carrying out procedures to establish that this new scale met these three requirements. A suitable sample of respondents was obtained through negotiations with YE London who facilitated access to pupils aged 16-18 at two YE Master Classes in London in 2002. A total of 196 cases comprised the final sample for the pilot study. The requirement of reliability was tested first, using Cronbach's alphas. Cronbach's alphas were calculated for each of the five sub-scales, and four of the five scales met the threshold of a coefficient alpha of greater than 0.7. The "intuition" scale, however, did not meet this minimum threshold. It also needs to be recorded that normally a standard test-retest process would be carried out to ensure the consistency of the reliability. In which case the test would be administered to the same sample at a later date. However, gaining access to the respondents who attended different schools throughout London was not feasible given the limitations of both time and cost.

Structural validity, to establish the unidimensionality of each sub-scale, was investigated using principal component analysis (PCA). PCA identifies the underlying structure of a scale by calculating the correlations between statements. Ideally, these correlations should reflect the construction of the original theoretical model for the scale. A series of PCAs using a varimax (orthogonal) rotation, was carried out until a factor structure emerged that most clearly reflected the original model. This process, which involved eliminating statements according to their contribution to the overall validity and reliability of a sub-scale, was informed by the informal feedback received

from pupils who had completed the questionnaire. Their comments about ambiguous or confusing statements helped to determine which statements were eliminated. A four factor structure was developed, which included factors with statements which reflected four dimensions: leadership, creativity, personal control and achievement. It was not possible to identify a structure for statements on the "intuition" scale, which reflects the lack of internal reliability in this scale. It was decided to drop "intuition" therefore at this stage of the pilot, and to re-design the statements for the main study. The remaining four factor structure consisted of just 18 statements, which is the most parsimonious solution that provided a valid and reliable measure of enterprise potential in young people.

Concurrent validity was established by comparing the four constructs with the Protestant Work Ethic scale (PWE). Findings showed that the four constructs were indeed measuring different constructs than the PWE. The final stage of the pilot study involved testing the external validity of the of the ATE test, using a predefined group of young people with future intentions to found a business (future business owners). A bivariate analysis compared the mean scores for future business owners with the mean scores of control. The future business owners group scored significantly higher on the ATE test than control confirming that the ATE test can accurately distinguish between these two groups.

Following the findings of this pilot study, the ATE test will need to be modified before using it again in the main study, on a separate sample of young people. In particular, the statements in the intuition scale, for which a factor solution could not be found, need to be re-written so that they more clearly reflect the original meaning of this dimension. Statements on the achievement scale could also be modified to improve the reliability and validity of this scale. The next chapter, therefore, begins with these modifications to the first version of the ATE test, and shows how it was redesigned for a second pilot study.

Chapter Six: Developing Version 2 of the Instrument

6.1 Introduction

The development of a robust evaluation tool capable of being used in enterprise programme evaluations was continued through a second pilot study. In Chapter Five the first version of the attitudes towards enterprise (ATE) test was piloted on a sample of young people from secondary schools in London. The aim of this chapter is to show how the findings from this initial pilot study were used to develop the second version of the instrument. The first pilot study exposed a number of methodological and conceptual weaknesses in the design of the instrument. The initial simple conceptualisation of attitudes towards enterprise, as depicted in Figure 3.1 , had apparently generated sometimes ineffective statements, that were neither well conceptualised, nor operationalized. Many of the initial statements were found to be redundant, and some were misunderstood by respondents. Feedback from pupils indicated that sometimes the language used was rather out of date, and out of touch with the reality of young people's language in London. This in turn resulted in low reliability in some constructs, and a lack of structural validity in the test as a whole. Based on feedback from respondents, and the findings from the reliability and validity testing, it was decided to re-examine the initial conceptual framework to improve the overall effectiveness of the test.

Procedures for developing scales indicate that new scales must meet three basic criteria: internal reliability, unidimensionality, and external validity. Following these procedures the original instrument was reduced to 18 statements, with many of the original statements discarded. One of the scales, the intuition scale was dropped altogether. This chapter charts the progress of the second pilot study to refine the instrument. This first involved returning to the original definitions of the constructs underlying each sub-scale in the conceptual framework. A re-examination and re-modelling of this conceptual framework was needed as a basis for improving the test. Following this it would be necessary to re-word statements or introduce new ones that better reflected this underlying meaning. Once the instrument was refined in this way the second version was then administered to a new sample of young people aged 16-18, to carry out further reliability and validity testing.

6.2 Procedures for designing new scales.

The reliability testing followed similar procedures to the pilot study and used Cronbach's coefficient alphas. The validity testing consisted, in this case, of structural validity (unidimensionality), and external validity. The process of establishing structural validity used principal component analysis (PCA) followed a similar seven stage decision model presented in Chapter Five on the pilot study, based on Hair *et al.* 1998. However, in this second pilot PCA was not used in an exploratory way but rather to confirm that each of the sub-scales were unidimensional. This process was designed to develop the underlying valid factor structure of the ATE test. At the end of the first pilot study this had been partially achieved with four of the five dimensions: leadership, creativity, personal control and achievement, though the 'achievement' scale had low reliability (0.718).

Finally, external or criterion validity is established by identifying a group of young people with intentions to found a business in the future, who would be expected to score significantly higher than a control group of young people with no such aspirations. The aim is to test whether the ATE test can distinguish between young people with aspirations to start their own business and the control group in this way.

The next section focuses on the re-design of the ATE test, based on the findings of the reliability and validity analysis in the first pilot study. The redesign of the test was based on a modification of the conceptual framework, which is also presented in the next section. This is followed by a description of the methodology used in the second pilot study, which sought to establish the reliability and, structural and external validity of the second version of the ATE test.

6.3 Designing the Second Version of the ATE Test

In the original conceptualisation of enterprise potential it was acknowledged that self-efficacy was an influencing factor. However, self-efficacy was not built into the actual design of the conceptual framework. It was therefore decided to re-examine

the role of self-efficacy in entrepreneurship, to determine whether this could improve the effectiveness of the test.

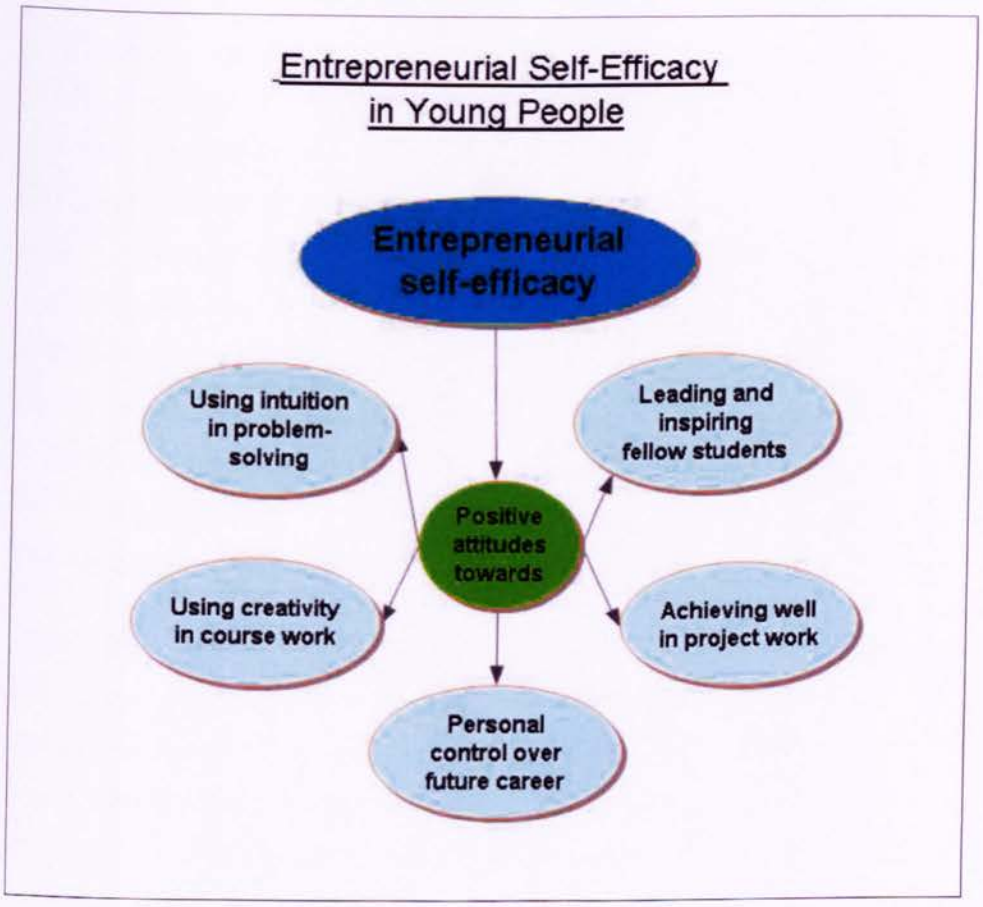
There is increasing evidence to suggest that self-efficacy is an important factor in the choice of entrepreneurship as a career (Chen *et al.* 1998; Krueger and Brazeal 1994; Krueger and Carsud 1993). The concept of self-efficacy comes from social cognitive theory, and states that people who expect to perform well at a task, will do better than people who expect to perform badly (Gist and Mitchell 1992; Bandura 1986).

Self-efficacy has therefore been shown to act as a regulator that influences levels of success in carrying out tasks. Self-efficacy has also been shown to be reliable indicator of academic achievement in children, and such scales are used widely with children and young people (Martinelli *et al.* 2009; Pajares & Schunk 2001; Pajares 1996). Furthermore, there is a growing body of research into the development of entrepreneurial self-efficacy scales for adults (McGee *et al.* 2009). Self-efficacy is at the centre of Bandura's social cognitive theory (Bandura 1986). Perceived self-efficacy, which can be measured using scales, is a reflection of people's beliefs about their capability to successfully accomplish certain tasks.

According to Bandura (2006) the construction of sound measurement scales relies on a good conceptual analysis of the relevant domain. Self-efficacy is not a global trait but is domain specific. That is, one may have high self-efficacy in one area but low self-efficacy in another. Therefore, self-efficacy scales need to reflect this by being multi-dimensional. Each dimension should also be domain specific, that closely reflects a domain which will be familiar and relevant to potential respondents. A weakness of the original ATE test was a lack of specificity in the domains relating to each sub-scale. To rectify this, the domains were redefined by placing them in a specific context, which would be relevant to young people. Figure 6.1 shows how the domains were specified for each dimension by contextualising them in situations young people would find familiar. The three weakest scales were redefined as follows: 'Intuition' was redefined as 'using intuition in problem-solving'; 'Achievement' as 'achieving well in project work'; and personal control' as 'personal control over future career'. The remaining two sub-scales were redefined as follows: 'Creativity'

became 'using creativity in the classroom', and 'leadership' became 'ability to lead and inspire others'. As Figure 6.1 shows, young people with positive attitudes in these areas will have high entrepreneurial self-efficacy.

Figure 6.1 Modified Model of Entrepreneurial Self-Efficacy in Young People



This reconceptualisation of the framework has provided a sound basis for the re-design of the test. The next step was to examine the individual statements in each construct to determine how well they reflected the new conceptualisations, and thus whether they could be retained, re-written or omitted.

Following analysis of the pilot data it emerged that six statements in the intuition dimension and four of those in the achievement dimension lacked this clarity of definition. Some of these statements were not well contextualised and appeared vague. Definitions and contexts need to be unique and distinguishable from each

other, and furthermore statements should be concise and use simple language. Based on these principles statements were re-written to achieve more concise and clear language.

6.4 Revised Test Dimensions and Statements

A procedure was followed whereby statements were retained which had a strong coherent theme. This is reflected in high statement loadings and alpha scores of 0.8 or approaching 0.8 (Table 5.7; Table 5.8). Then weak statements would be identified and discarded through an iterative process of factor analysis and reliability testing. First, it was decided to build on the original statements by contextualising and providing clearer definitions for dimensions where necessary. 'Self-perceptions of ability to lead others' and 'perceptions of creativity" already had strong definitions which were reflected in high statement loadings and high overall alphas (over 0.8). Therefore, these two scales remained largely unchanged. However two statements on the leadership scale were re-worded to avoid duplication and to increase clarity. Details of the changes made are presented in the following sections.

The remaining three scales: personal control; achievement; and intuition had alphas less than 0.8 and were therefore in need of some re-definition, particularly the intuition and achievement scales. It was decided to achieve a stronger definition for these dimensions by providing a more defined context and common themes for the statements. The statements in each dimension were evaluated in the light of these definitions and where necessary new statements were added and some original statements were re-worded to use more simple language and clarity was achieved by weeding out ambiguous statements. The original definitions for these scales were re-visited to help the design of the second version of these scales.

Definition for the Attitudes towards Intuition Scale

The definition of intuition underlying this scale was developed in Chapter Three. Here an intuitive person was defined as someone who preferred informality to formality and could cope with uncertainty. An intuitive person was described as someone who not only coped with and but who actually enjoyed uncertainty. Finally,

intuition was also defined as willing to take risky actions in uncertain environments. Six of the attitude statements that most closely related to this definition were retained. However they were also re-worded. One of the criticisms made by respondents during the first pilot study was that many of these statements were difficult to understand and ambiguous. Looking at the original statements in the intuition scale, many of them did actually have several clauses and were clumsy. The aim of this revision was to write shorter sharper statements with clearer meanings. Given the recommendation that attitude scales should be domain specific, it was also decided to narrow the definition of intuition to describe "intuition in problem-solving". The final six statements to be included in the second version of the tool were as follows: (The original statements are in italics.)

Intuition in problem solving (6 statements).

If you don't know all the facts about a problem then there is no way you can find the answer. *(reworded)*
If you don't know all the facts about a problem then there is no way you can figure it out.

Making mistakes is a good way of finding out how to solve a problem. *(reworded)*
Making mistakes is a good way to learn.

Instinct helps me work out solutions, to problems we are set. *(reworded)*
I can often instinctively figure out solutions to problems we are set.

I trust my own instinct when solving problems in class. *(reworded)*
I trust my own instincts when making decisions in a lesson.

If I don't know the answer to a problem, then I'll have a guess. *(reworded)*
If I don't know the answer to a something then I'll usually have a guess.

I'll keep trying out different solutions to a problem rather than give up. *(reworded)*
I'll have a stab at a solution to a problem rather than give up.

Definition for the Attitudes towards Achievement Scale

A person with positive attitudes towards achievement was described as a dynamic person, willing to see things through, and who was goal orientated. These positive attitudes towards achievement are reflected in actions such as actively seeking to achieve goals, and a commitment to make things happen. According to Gibb (2000;

1993) people with a need for high achievement have high energy levels and are likely to have high motivation, and the ability to carry on with tasks in the face of set backs. Finally the achievement oriented person is dynamic and self-confident. Given the focus on goals in definitions of achieving people it was decided to use project work as the specific domain for attitudes statements relating to achievement. The final six statements in the achievement scale were:

Achievement orientation in project work (6 statements).

I work hard to make my projects successful. *(new item)*
It feels good when a project works out well in class. *(re-worded)*
It feels good when a project works out well.

It doesn't matter if my project work is no good. *(new item)*
It's important to finish off a project as well as you can. *(reworded)*
I like to get things finished properly in class.

I am proud of my project work this year. *(new item)*
Working hard on projects is well worth the effort. *(new item)*

Definition of Attitudes towards Personal Control Scale

Attitudes towards personal control include feelings of autonomy and a desire to act on one's own initiative. Personal control has been linked to self-esteem, particularly in young people (Stipeck and Nord 1981), so statements could relate to positive attitudes about oneself, being satisfied with who you are/wanting to be different, having respect for oneself – or not, or feelings of self-worth, pride and ability to carry out desires, and control over future career. This scale required the most revision and careful thought was given to a suitable domain to clarify the aim of the statements. It was decided to use future career prospects as the most appropriate domain to measure young people's attitudes towards personal control in their own lives. The final six statements therefore were:

Perceived personal control over career (6 statements).

Other people will get the best jobs. *(unchanged)*
I think my future career success is largely up to me. *(unchanged)*
I have a lot of faith in my ability to succeed in my future career. *(reworded)*
I think my future career success is largely up to me.

It is important to plan my future career. *(new item)*
I am worried that I will not make a success of my future working life. *(new item)*
I have as much chance as anyone else, of getting a good job in future. *(new item)*

6.5 Method

The procedures for establishing reliability and validity of the sub-scales/dimensions of the ATE were outlined in the previous chapter with respect to the pilot study. This second pilot study followed similar procedures in testing the reliability and validity of the second version of the ATE test. It may be remembered that there are three main requirements for scale development: reliability using Cronbach's coefficient alpha; structural validity (or unidimensionality); and finally external validity, which tests whether the scale measures what it is intended to measure (e.g. DeVellis 1991;Hair *et al.* 1998; Chandler and Lyon 2001). The revised ATE test was incorporated into a new questionnaire before administering the test to a new sample of young people. Once again, YE London were approached and offered to help with obtaining a suitable sample. The one-day YE Masterclass was being run in central London and provided a useful venue to obtain the sample for this second pilot study, which was carried out during 2003.

The questionnaire consisted of two parts, one focused on demographic details and the second comprised the attitudes towards enterprise test (ATE test). The demographic section contained a number of questions concerning gender, age, ethnicity and school attended. Respondents were also asked a number of questions about their future career intentions and whether they intended to set up and run their own business one day. The second part of the questionnaire was a modified attitudinal scale comprising the five dimensions: creativity, personal control, intuition, leadership and achievement. The definitions of three of the scales: achievement; intuition and personal control, were re-visited and refined as described in Section 6.4. Each of the five scales (including leadership and creativity) comprised of six statements, making a total of thirty statements, Respondents were asked to indicate how much they agreed or disagreed with each statement on a scale of 1 (strongly disagree) to 7 (strongly agree). A Likert scale of 1-7 was used rather than the 1-5

scale used in the pilot study, to give greater scope for choice by respondents, and to therefore provide a more sensitive instrument.

6.6 Sample Profile

There is a range of recommended sample sizes from 300 (Nunnally and Bernstein 1994; Tinsley and Tinsley 1987) to 200, which is considered fair (Comrey 1988). Indeed, Thompson (2009) used a sample of 106 in a pilot study to develop a metric to measure individual entrepreneurial intent.

The second version of the ATE test was administered to 193 participants in a Young Enterprise Master class held in central London during 2003. The aim of the Master Class is to allow young people to experience in one day, what a Young Enterprise Programme would be like, by carrying a range of different activities. The participants are split into groups, each with a business owner as a mentor for the day. Attendees tend to come from a wide cross section of schools in London including both independent and state schools and therefore provided a convenient group from which to draw a sample of young people.

The characteristics of these respondents are shown in Table 6.1. There were 103 females and 90 males. Some of the pupils attended selective grammar schools which have highly selective entrance tests similar to many of the top independent schools, while others came from independent schools which had no entrance exam. Given the similarity between league table results of selective grammar schools and top independent schools (which both appear towards the top of the league tables) it was decided not to divide the schools into independent and state. Instead schools attended were divided into selective (98) and non-selective (95) schools rather than independent and state schools, as there are some highly selective state schools in the South London area, which use an 11 plus type exam at entry.

As well as completing the ATE test respondents were also asked whether they had any future intentions towards starting their own business; 103 had strong intentions, while 90 had no such intentions. Intentions towards starting a business was used as the dependent variable during external validity testing of the instrument.

Table 6.1 Sample Profile of the Second Pilot Study

Characteristics	Number (%) (N=193)
Gender	
Male	90 46.45%
Female	103 53.4%
Selective school	
Yes	98 50.8%
No	95 49.2%
Future business owner	
Yes	103 53.4%
No	90 46.6%

6.7 Reliability Testing

To test the reliability of the sub-scales Cronbach alphas were calculated for each using all six statements (Table 6.3). Following initial piloting testing, when a scale is closer to being used it is common practice to check that the scales used are reliable for the different types of respondents who will be using the scale (De Vellis 1991). In this case the ATE test is designed to be used in evaluations of enterprise programmes in secondary schools. Respondents will include males and females, as well as pupils attending both selective and non-selective schools. It may be the case that though the tool is reliable in non-selective schools it is not reliable in selective schools and DeVellis (1991) recommends carrying out further reliability testing to ensure the scale is suitable for use in different settings.

Therefore to evaluate the internal consistency of each of the five subscales among different groups of young people, Cronbach's alphas were calculated for males, females, pupils attending selective and non-selective schools. For this second version of the ATE test a series of reliability tests was carried out, to test reliability of the sub-scales for different demographic groups. As well as reliability tests using the

whole sample, Cronbach alphas were also calculated for males and females, and for pupils attending selective schools and non-selective schools.

For the whole sample Table 6.2 shows that four of the subscales were internally reliable with alphas over 0.70, which was used as the threshold for this study. The intuition subscale achieved an alpha of 0.664, which is close to the desired threshold of 0.7. As the intuition scale was very close to the reliability threshold of 0.7 it was was decided to retain this sub-scale for further testing including the validity testing. Next Cronbach's coefficient alphas were calculated for males and then females.

Table 6.2 Cronbach's Alpha Scores for Main Constructs (N=193)

Sub-scale	*Number of items*	*Cronbach coefficient alpha*
Perceptions of creativity	6	0.802
Achievement orientation in project work	6	0.742
Perceived personal control over career	6	0.745
Self-perceptions of ability to lead others.	6	0.792
Intuition in problem solving	6	0.664

Table 6.3 shows the coefficients for each subscale by gender. These coefficients showed a similar pattern to the sample as a whole. All the coefficients were over the threshold of 0.7 apart from both the 'intuition' coefficients. The coefficient alpha for females was stronger at 0.686 than the alpha for males at 0.644. However, these differences are very small and as slight differences between groups is to be expected, the test can still be used with confidence for males and females (DeVellis 1991).

Table 6.3 Cronbach's Alpha Scores by Gender (N=193)

Sub-scale	*Males (n=90)*	*Females (n=103)*
Perceptions of creativity	0.808	0.793
Achievement orientation in project work	0.715	0.742
Perceived personal control over career	0.685	0.768
Self-perceptions of ability to lead others.	0.793	0.786
Intuition in problem solving	0.644	0.686

The final reliability testing was carried out to explore the internal consistency of each subscale in selective and non-selective schools. Once again there were only slight differences between in most sub-scales between the two groups. Interestingly, there were slightly large differences in the internal consistency of the 'leadership' subscale between the two samples. This scale was more reliable in the selective schools (0.832) compared to non-selective schools (0.688). Findings for the 'intuition' subscale were similar to the reliability findings for the whole sample, though the alpha was higher in selective schools.

Table 6.4 Cronbach's Alpha Scores by Type of School (N=193)

Sub-scale	*Selective (n=98)*	*Non-selective (n=95)*
Perceptions of creativity	0.803	0.797
Achievement orientation in project work	0.753	0.731
Perceived personal control over career	0.777	0.696
Self-perceptions of ability to lead others.	0.832	0.688
Intuition in problem solving	0.663	0.615

Having established that the second version of the ATE test was largely internally reliable, with a caveat about the intuition subscale, the second version of the ATE test was then tested for validity.

6.8 Testing for Structural Validity

Following the procedures used in the pilot study structural validity of the measure was tested using principal component analysis (PCA). One of the first decisions to be made about factor analysis is whether the purpose is exploratory or confirmatory (Hair *et al.* 1998). In the pilot study the purpose of the factor analysis was exploratory, because a completely new scale was being tested for the first time. For testing the second version of the ATE test, however, it was decided to use a confirmatory approach. In a confirmatory approach each dimension is tested separately and all statements in the sub-scale are submitted for PCA. The aim is to achieve a unidimensional scale where all statements correlate with only one

component. Therefore, a PCA with a varimax rotation was carried out for each of the five sub-scales. Ideally, if the statements load onto only one component then rotation will not be necessary. Results of these PCAs are shown in Table 6.5.

Table 6.5 Component Matrix Version Two

Component *(Extracted separately)*	***Statements***	***Factor loading***	***Eigen values***	***Percentage of variance extracted***
Leadership	I take charge of other people at school. I'm good at motivating my classmates. I enjoy talking the class round to my point of view. I think I can easily persuade my classmates when I have a plan. I don't like being the centre of attention in class. My friends would say I am a follower rather than a leader.	.825 .820 .689 .683 .649 .541	3.021	50.349%
Creativity	I don't enjoy lessons where it is up to pupils to come up with ideas. I like lessons that really stretch my imagination. I dislike teachers who are always coming up with new ideas. I think I show a lot of imagination in my schoolwork. I enjoy lessons where the teacher tries out different ways of teaching. I believe a good imagination helps you do well at school.	.761 .754 .720 .708 .690 .616	3.023	50.383%
Personal Control	I am worried that I will not make a success of my future working life. Other people will get the best jobs. I have as much chance as anyone else of getting a good job in future. I have a lot of faith in my ability to succeed in my future career. It is important to plan my future career. I think my future career is largely up to me.	768 .730 .702 .632 .591 .544	2.661	44.351%
Achievement	It doesn't matter if my project work is no good. It is important to finish off a project as well as you can. I am proud of my project work this year. It feels good when a school project works out well. Working hard on projects is well worth the effort. I work hard to make my projects successful.	.789 .748 .626 .617 .603 .602	2.682	44.705%

Intuition	I'll keep trying out different solutions to a problem rather than give up. If you don't know all the facts about a problem then there is no way you can find the answer. If I don't know the answer to a problem, then I'll have a guess. Instinct helps me work out solutions to problems we are set. Making mistakes is a good way of finding out how to solve a problem. I trust my own instinct when solving problems in class.	.868 .764 .634 .499 .477 .405	2.381	39.676%

In fact none of the PCAs were rotated because each of the five PCAs extracted only one component. The variance extracted for each sub-scale was also good (Table 6.6). This means that each scale had only one component, that is to say all six statements loaded only on to one component. These results indicate that all the subscales was unidimensional, and therefore each subscale is measuring only one latent variable. The measure overall therefore had strong structural validity. The results also confirm that each subscale has convergent validity, which is a similar test to Cronbach's alphas in that it shows that all the items in a scale correlate, or converge, with each other and with the total statement pool.

6.9 External Validity Testing

Next a test for external validity was carried out. Normally, for external validity a sample of known entrepreneurs would be used. However as this study was investigating enterprise potential in young people still at school, it was unlikely that there would be any entrepreneurs to provide a sample. Instead a measure of future intentions towards starting a business was used as the dependent variable, by asking respondents to indicate how likely it would be that they would be running their own business by the time they were 21 years old. A group of 103 young people who expressed a strong intention to run their own business in future was compared with a group of 90 who did not envisage running their own business (Table 6.7). To explore differences between the future business owners and the control group T-Test was calculated using average scores achieved on the sub-scales for each group

Table 6.6 Sample by Intentions to start a business

Intention to start a Business	Number	Percent
Yes	103	53.4
No	90	46.6
Total	196	100.0

Average scores were calculated by first summing scores of all statements in each sub-scale (leadership, creativity, achievement, and personal control, and intuition). A total ATE test score was then calculated by summing sub-scale scores for each respondent. Differences in average ATE test scores for the future business owners group and the control group were then assessed using a T-test.

Table 6.7 displays the probabilities that mean differences between the business owners group and the control group in the sample were significantly different. The average score for the future business owners group on the total ATE test score was significantly greater than the average scores for the control group. The average score for the future business owners group on the ATE test was 130.00, whereas the average score for the control group was 114.90. The future business owner group also scored higher than the control group for each separate sub-scale, and the difference in average scores was greatest and significant for the sub-scale measuring creativity. The average score for the business group for the creativity sub-scale was 29.08, and the average score for the control group was 25.94.

Table 6.7 Mean scores for Aspiring Business Owners and Control Group

Dimensions	Group	ATE Test scores by sub-scale *(max score =42)*	Significance
Creativity	Business	29.08	0.000**
	control	25.94	
Leadership	Business	24.45	0.000**
	control	21.21	
Intuition	Business	25.52	0.000**
	control	22.90	
Achievement	Business	24.20	0.000**
	control	20.96	
Personal control	Business	26.73	0.000**
	control	23.87	
Overall ATE score Max score =210	Business	130.0	0.000**
	control	114.90	

** *significant at 0.001*

6.10 Conclusions

The findings of the first pilot study indicated that more work needed to be carried out to achieve the levels of reliability and validity required in the development of new scales. Given the problems raised by respondents about the meanings of some of the statements, the lack of underlying structural validity on some sub-scales, and low reliability on others, it was decided to re-examine the original conceptual framework. This was a simple model, which described the relationship between attitudes to five dimensions and enterprise potential. On re-visiting the literature in entrepreneurship research, and the increasing prominence of the role of self-efficacy, it was decided to use conceptual and methodological insights and techniques from self-efficacy theory to improve the effectiveness of the test. A re-conceptualisation of the model of enterprise potential in young people was developed, which was more complex than the original model, and gave a central role to the concept of self-efficacy. This new conceptual model then provided a much sounder foundation on which to develop a modified attitudes to enterprise test. Each construct was re-defined with a unique and specific domain relevant to young people still at school. The leadership and creativity constructs, being the most tangible and easily defined, required little modification. However, for the remaining constructs, achievement, personal control, and in particular intuition, this redefinition was key to developing better and more effective statements. A second pilot study was then carried out using a new sample of young people.

The results of this study, presented in this chapter, indicate that this second version of the ATE test has met the reliability and validity requirements necessary in the development of new scales. The study also showed that the test is capable of distinguishing between pupils with aspirations to be future entrepreneurs and pupils without such aspirations. Business owners scored significantly higher on the ATE test than pupils in the control group. This second pilot study has enabled further development of the ATE test and resulted in a reliable and valid instrument. It was, therefore, decided that this version was suitable for use in a longitudinal study to investigate the impact of participation in a YE Company Programme on young people still at school. This pre- and post-test study is reported in the next chapter.

CHAPTER SEVEN: Evaluating a School Enterprise Programme using the ATE Test

7.1 Introduction

So far this thesis has focused on the development of the Attitudes to Enterprise (ATE) test, which was designed to measure enterprise potential in young people. The need for such a test was identified and is based on two main arguments: one concerning evaluation methodologies, while the second centres on the lack of an appropriate evaluation tool for young people. The first argument is that enterprise policy initiatives should be evaluated to provide evidence about their efficacy to providers, policy makers and government; and to justify expenditure of public money, however, many researchers have highlighted a lack of rigorous independent evaluation studies of enterprise education programmes in particular (Levie *et al.* 2009; Hytti and O'Gorman 2004; Peterman and Kennedy 2003; Westhead *et al.* 2001; Storey 2003; 2000). The criticisms made by these researchers of existing evaluation studies have been covered in previous chapters, and a brief recap is provided here. In chapter four, section 4.2 Storey's (2003; 2000) framework for reviewing evaluations of enterprise programmes was discussed in detail.

The framework is designed to identify the main criteria of good practices in research studies needed to establish links between programmes and outcomes. The framework consists of six steps, of monitoring and evaluation methods, which increase in rigour and sophistication through from step I to step VI. The first three are simple monitoring exercises, the next three steps, identified as 'best practice' models, are those carried out by independent bodies. Key conditions of these models include the use of representative samples, and techniques to isolate the impact of participation in an enterprise programme by controlling for other variables that may influence outcomes. The main focus in the final three steps is on the comparison with control or non-participant groups and controlling for self-selection bias.

A more recent analysis of the same problems by Levie *et al.* (2009) argues in a similar way, that there are a number of methodological challenges in evaluating the impact of enterprise education on entrepreneurial skills and attitudes. These

challenges include the need to account for self-selection bias; the need for objective measures, as effects may long term, a need for control groups to demonstrate effects, and finally a method to account for different kinds of training at different times. It is proposed that the evaluation tool developed in this research will enable the design of better methodologies capable of taking these considerations into account.

Levie *et al* (2009) used data from the Global Entrepreneurship Monitor (GEM) to investigate the impact of enterprise education and training on start-up skills perception and opportunity recognition. They found that among non-graduates, voluntary enterprise training in schools had a significant effect on skills. Voluntary and compulsory enterprise training in college also had significant positive effects on skills perceptions, though not on opportunity perception. Work placements at school or college had a significant effect on both skills perception and opportunity recognition. They found that a combination of enterprise education in formal education and placements could make a measureable difference to entrepreneurial capacity in the UK. They concluded that rigorous evaluations of enterprise programmes were needed, that can take into account a range of contextual factors that may impinge on outcomes, besides participation. These contextual factors may include the location of the programme (school, college etc.); the age of the participants; as well as other factors such as a family background of business ownership; ethnicity and gender.

It has been argued in this thesis that an evaluation tool such as an attitude test could be used to measure both the impact of enterprise programmes, and the influence of other contextual factors, as outlined in the previous paragraph. However, a search for such an instrument, which was the starting point for this research, and as charted in previous chapters, failed to identify an appropriate instrument that was suitable for use with young people. Hence, my subsequent development and testing of the ATE test. In chapter six I presented the latest version of the test, which was then subjected to reliability and validity tests. Having established that the test meets the necessary criteria, it was decided to use the test to evaluate the impact of participating in a Young Enterprise Company Programme on young people. This evaluation study is the subject of this chapter. The aim is to show how the ATE test

can be used to meet the criteria of good practice evaluations as identified by other researchers in the field, namely: Levie *et al.* (2009); Hytti and O'Gorman (2004); Peterman and Kennedy (2003); Westhead *et al.* (2001); and of course Storey (2003; 2000).

The evaluation study was carried out in secondary schools in London during the 2004/2005 academic year. This chapter charts the progress of the study in eight sections. The following section looks at the unique regional character of London in terms of innovation and entrepreneurship. This is followed by a section on the aims of YE programmes and the research questions, posed as a series of hypotheses. In sections four details of the methodology are outlined, drawing on the findings of Chapter Four, and the good practice criteria that were identified. The results of testing the reliability of the ATE test are presented in section five. In section six there is a description of the schools which participated in the study, along with the sample profile. This section also explains how self-selection bias was taken into account using the ATE test. Section seven contains the main findings of the study. Conclusions, and the strengths and weaknesses of the research design are presented in the final section of this chapter. First though a look at London and its unique regional character, and the impact this may have on the enterprise potential of its young people.

7.2 London as the Location of the Research

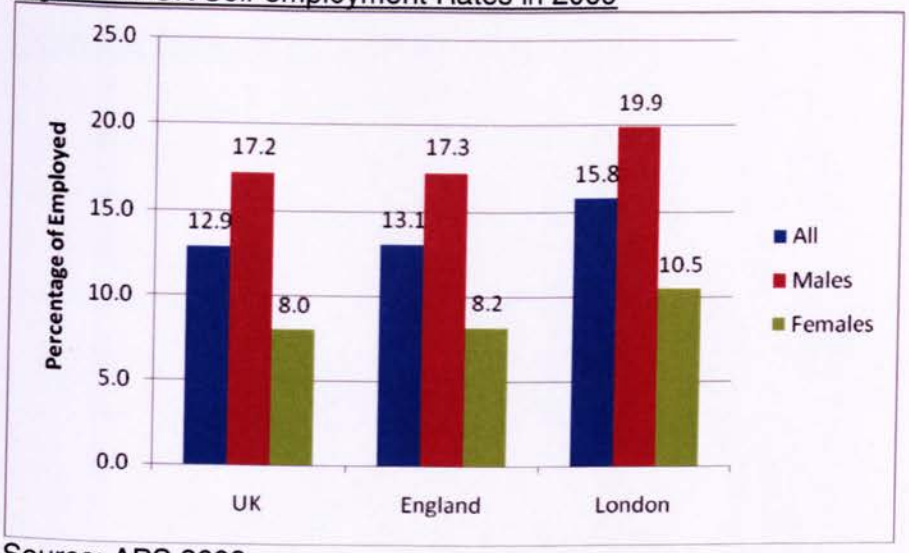
Early research by Simmie *et al.* (2002) suggested that the wider London region was characterised by multiple clusters of innovative sectors attracted by accessibility, well established infrastructure including airport hubs, and a pool of professional labour. In a more recent study Burke *et al* (2008) investigated why the South of England has more self-employed people than Northern England, where they found that the self-employed tended to create more jobs than those in the South. Using periodic surveys from the National Child Development Study (NCDS) carried out during six decades from the 1950s to the 1990s, they focused on self-employment in two regions. They found that there were more self-employed people in the South, but on average they created fewer jobs. After carrying out a number of logit models to test the relationship between self-employment and other contextual factors, they concluded that the causes of these regional differences were mainly structural rather

than regional variation in individual characteristics. Post compulsory education was found to have a strong negative effect on the probability of self-employment in the South, probably due to better employment opportunities there, whereas it had little influence in the North. Education, they found, also had some positive effects on job creation by entrepreneurs in both regions. The role of post-secondary education, at the national level has been found to reduce the number of self-employed, but increase job creation by entrepreneurs (e.g. Cowling 2003). However, the disaggregated analysis by Burke *et al* (2008) highlights the differences found in these effects at a regional level.

Data on self-employment rates in London from the Annual Population Survey (APS) also highlight the greater propensity of self-employment in London compared to the rest of the UK. The APS was developed by the Office for National Statistics (ONS). as annual local area data sets called the APS household data sets. They allow for production of family and household labour market statistics at local areas and for small subgroups of the population across the UK (Ashton and Kent 2008).

According to Ashton and Kent (2008) the (APS) household data set comes from the Labour Force Survey (LFS) and the APS (person) data set. The former is a quarterly survey of households living at private addresses in the UK. The latter is created by combining individuals from four consecutive LFS quarters with the English, Welsh and Scottish Local Labour Force Surveys. The APS household sample is three times the size of the LFS sample. It contains information collected from a sample of around 160,000 households (300,000 people aged 16 or over), whereas the LFS data sets only have a sample size of around 53,000 households (100,000 people aged 16 or over). The APS shows for instance that the rate of self-employment in London during 2009 was 19.9 *per cent*, compared to 17.2 *per cent* for the whole of the UK (Figure 7.1). The proportion of both self-employed males and females was also greater in London than in the UK as a whole.

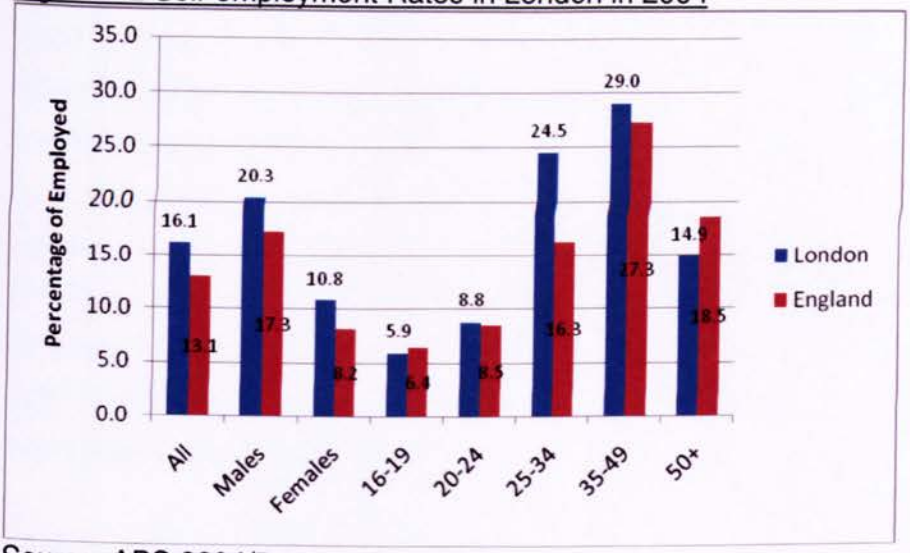
Figure 7.1 UK Self-employment Rates in 2009



Source: APS 2009

As the evaluation study of YE Company Programme was carried out during 2003/2004 Figure 7.2 shows the comparable data from the APS on self-employment in this period by age group, in London and in England. This shows that self-employment was higher in London than in England as a whole for each age group, apart from the 50 and over group and interestingly for this study, the 16-19 year old group. The difference, at half a percentage point, is only slight however. The greatest difference is in the 25-34 year old group, where London is ahead of England by more than eight percentage points.

Figure 7.2 Self-employment Rates in London in 2004



Source: APS 2004/5

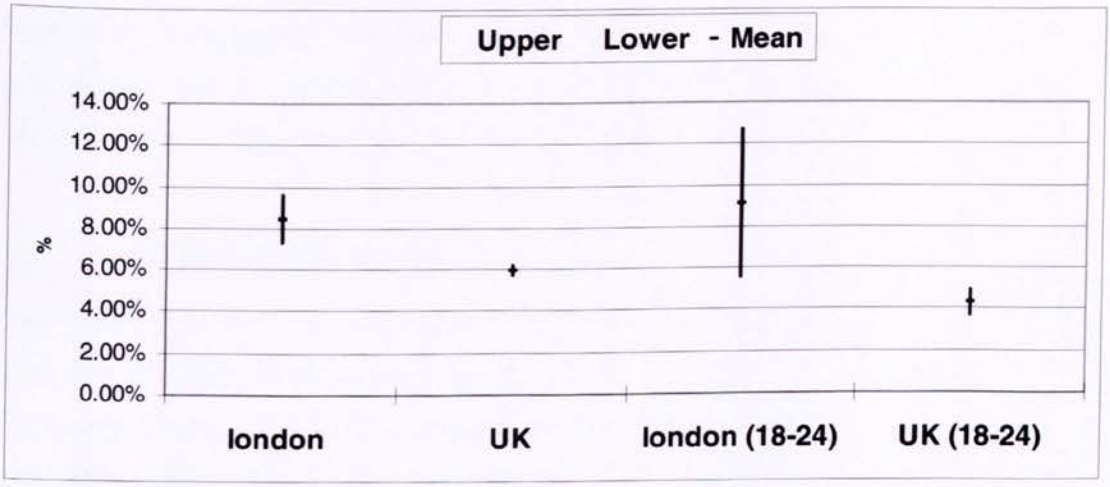
Further evidence of the unique regional nature of the South and London in particular, can be found in the Global Entrepreneurship Monitor (GEM) Surveys. GEM was set up in 1997 as a joint research initiative of Babson College in Wellesley (USA) and the London Business School. A pilot data study in six countries was carried out in 1998 (Canada, Denmark, Finland, Germany, UK and USA). Since 1999 a global GEM study has been conducted every year and by 2009 included 54 countries at various stages of economic development including G7 countries, Brazil, Russia, India and China (Bosma *et al.* 2008). The main objectives of GEM are to provide empirical evidence to answer three main questions:

- To what extent does the level of entrepreneurial activity vary between countries and change over time?
- Why are some countries more entrepreneurial than others?
- What kinds of policies can enhance entrepreneurial activity? (Levie and Hart 2009; Sternberg and Wennekers 2005)

Unlike the APS, which measures self-employment, the GEM surveys measure entrepreneurs at different stages including nascent or emerging entrepreneurs; owners of new and established businesses. The proportion of nascent entrepreneurs and new business owners equals the Total Entrepreneurial Activity (TEA) rate.

The recent GEM survey has indentified London, and in particular central London as a unique location in terms of entrepreneurial activity (Levie and Hart 2009). In 2008 GEM classified the United Kingdom overall as having a medium level of entrepreneurial activity compared with other countries worldwide, and lower than the US, Canada and other nations apart from Russia, though greater than other G7 nations (Levie and Hart 2009). Compared to other regions and the UK as a whole London has a higher than average total entrepreneurial activity rate (TEA). In the UK as a whole the TEA rate during 2004 was 5.96 *per cent* whereas for London the TEA rate was 8.48 *per cent* (Figure 7.3). Figure 7.3 shows the point estimates (the short horizontal bars) and 95 *per cent* confidence intervals (the vertical bars) for each main group in London and the UK.

Figure 7.3 TEA in UK and London by Age



Source: GEM UK 2004

In contrast to the APS survey, the TEA rate is also higher for young people aged 18-24 in London than it is for this group in the UK as a whole. In London the TEA rate for 18-24 year olds is 9.14 *per cent,* whereas for this age group in London the TEA rate is only 4.31 *per cent.* Clearly London is a very different region with regards entrepreneurial activity than the rest of the UK. Therefore the findings of the evaluation study of YE Company Programme will be compared to the TEA rate for young people as uncovered by GEM surveys.

Another study provides a more detailed picture of London's young entrepreneurs (Botham 2005). With a sample of around 1440 people under 30 years old, the study

used a combination of face to face interviews and a telephone survey. This sample was supplemented by 693 existing business owners under 30 from the LDA Annual Business Survey. The study found that young entrepreneurs (18-24 year olds) were likely to be well educated and come from an entrepreneurial family background. Just over half of the young business founders had a degree, and 10 *per cent* had a post-graduate qualification, while a further 35 *per cent* had trade or vocational qualifications. Almost 60 *per cent* had a least one parent who ran their own business.

Of all business owners 42 *per cent* were non-white ethnic minorities, and as 52 *per cent* of young people in London are white British, Botham (2005) concluded that young people from ethnic minorities were more likely to set up their own business than young people from the white population. It is possible therefore that ethnicity may have an impact on ATE test scores in the present study. Comparisons of ATE test scores will be made across a number of demographic variables including ethnicity, gender, age and type of school attended.

7.3 The Research Questions

The main focus of this element of the research is a longitudinal study using the ATE test, and designed to measure the effect of participation in a Young Enterprise (YE) Company Program on young people's attitudes toward starting a business and on their enterprise potential. The previous section also indicated the likelihood of other demographic factors impacting on program outcomes. Therefore an analysis of outcomes will include taking into account a range of additional factors.

YE in the United Kingdom is modelled on the U.S. Junior Achievement programs for young people. The vision of Young Enterprise is that all young people will have the opportunity to gain personal experience of how business works, understand the role it plays in providing employment and creating prosperity, and be inspired to improve their own prospects, and the competitiveness of the UK. YE Company Programme, it is claimed helps young people develop key skills and enterprise capability. It is this latter aim that this pre and post test study was designed to measure.

The aim of Young Enterprise is to inspire and equip young people to learn and succeed through enterprise During Company Program 15–18 year-olds set up and run their own enterprise in school over the course of one academic year. Students gain practical experience of business and enterprise through setting up and running their own company during one academic year. In their weekly meeting students have the support of a volunteer and mentor from the business sector. Participants must raise share capital to finance the company, which designs and makes a product or service to sell to the public. They must keep accounts and show how they have marketed and sold their product or service.

The research questions focuses on the impact of participation in a YE Company Programme on young people's attitudes to starting a business and on their enterprise "potential." As the literature review showed, Gibb (2000; 1993) has argued that enterprise skills are not fixed personality traits, but can be learned and developed through experience, which is a tacit premise of all experiential learning-based enterprise programs. Support for this argument was found in Littunen's (2000) study which highlighted the contingent nature of entrepreneurial characteristics, such as "personal control," which he found are developed through the entrepreneurial process. Based on these findings therefore, the first two hypotheses to be tested were:

> **Hypothesis 1:** Participants' ATE test scores will be higher than *nonparticipants'*.
>
> **Hypothesis 2:** Participants scores will be significantly higher after participation compared with their pre-test scores.

The next set of hypotheses was concerned with differences in responses by demographic group. For example, national statistics show gender differences in entrepreneurial activity, with men more likely to be engaged in such activity than women (Bosma *et al.* 2008; Harding and Bosma, 2006). Other differences relate to type of school attended, a family background of business ownership and ethnicity.

For example, previous research has found that pupils at private schools were more positive about self-employment *in the future than pupils attending state schools* (Curran and Blackburn, 1990). There is also evidence that points to the positive influence of a family background of self-employment on young people's decisions to become self-employed (Botham 2005; Davies 2002; Curran and Blackburn 1990). Finally, young Black people in the United States showed more desire for self-employment than other ethnic groups (Walstad and Kourilsky,1998), and Black undergraduates have been found to display stronger entrepreneurial traits than White or Asian undergraduates (Louw et al., 2003). It was also shown that in London young people from ethnic minority groups were more likely to be in business for themselves than were White young people (Botham 2005). Based on these demographic differences, the following additional hypotheses were designed:

Hypothesis 3: Young men and women will differ in their desire for business ownership.

Hypothesis 4: Pupils at selective schools and those at non-selective schools will differ in their desire for business ownership.

Hypothesis 5: Pupils with a self-employed parent and those with none will differ in their desire for business ownership.

Hypothesis 6: There will be differences in the desire for business ownership between pupils from different ethnic backgrounds.

Hypothesis 7: ATE test scores will differ between young men and young women.

Hypothesis 8: ATE test scores will differ between pupils at selective and non-selective schools.

Hypothesis 9: ATE test scores will differ between pupils with a parent in business parent and pupils with no parents in business.

Hypothesis 10: ATE test scores will differ between pupils from different ethnic backgrounds.

7.4 Methodology for the Evaluation Study

This thesis has argued that evaluations of enterprise programs are necessary to provide evidence on their effectiveness to policy makers and to guide future enterprise policy direction. To be effective, however, and to provide accurate information, evaluations need to be rigorous and meet certain necessary conditions (Peterman and Kennedy, 2003; Storey, 2003, 2000; Westhead *et al.* 2001). Despite the widespread increase in enterprise programs internationally, there is an acknowledged lack of such evaluations that meet the necessary conditions. Most program evaluations are simple monitoring exercises carried out as feedback for providers and funding agencies. One of the main problems, this research was designed to address, is a lack of valid and reliable evaluation tools. Along with a reliable evaluation tool, designs require other necessary conditions.

Storey (2000) and Westhead *et al.* (2001) recommend that the design of enterprise policy evaluations meet certain basic standards. They make four main recommendations. First, a representative sample of participants should be used; second, matched control groups need to be incorporated; third, pre and post (program participation) testing should be carried out; and finally, objective as well as subjective outcomes should be measured. In this study, the first three standards were met and the fourth condition is partially met. The research design incorporated a representative sample with matched control groups, and a pre- and post-test design. ATE test scores provide an objective measure of enterprise potential, in other words, participants are not required to provide subjective measures about the impact of the programme. A better measure, however, would be to track participants and non-participants over time to record actual business start-up rates.

In Chapter Four methodologies for the development and use of scales in enterprise programme evaluations were reviewed, with the aim of identifying good methodological practices. With regards to the use of scales in programme evaluations, reliability testing emerged as a key good practice in the design of

methodologies. Reliability testing, using Cronbach's coefficient alpha, was identified as the most commonly used approach for testing the reliability of existing scales. DeVellis (1991) and Chandler and Lyon (2001) in their reviews of scale development and use both emphasise the importance of testing the reliability of new and existing scales. Crant (1996) and Peterman and Kennedy (2003) each used existing scales that had already been piloted, and carried out their own reliability testing, using Cronbach's alphas, for their studies. Other studies, however, which also used existing scales in research designed to measure enterprise characteristics and attitudes did not test the reliability of the scales, and thus the findings of theses research studies can be questioned (Cromie 2000; Cromie and Callaghan 1997; Cromie and O'Donoghue 1992; Bonnett and Furnham 1991; Athayde 1991; Since the reliability of the scales used was not established the findings and the interpretation of the findings may not themselves be reliable and valid.

In this study, therefore, it was decided to test the reliability of each of the five sub-scales at each stage of the research: the pre-test stage prior to the commencement of the programme, and the post-test stage at the end of the programme. This was done to ensure that the ATE test was reliable throughout the study, so that the interpretation of the results could be carried out with confidence.

The second version of the ATE test was administered to pupils attending six secondary schools in London. Pupils participating in a Young Enterprise Company Programme and pupils not participating were asked to complete the ATE test at the beginning of the academic year 2003-2004 (before the YE programme had commenced). All respondents were then asked to complete the ATE test again towards the end of the academic year. The aim was to measure the impact of participating in YE Company Programme on young peoples' enterprise potential.
One of the main objectives for evaluations of enterprise training initiatives identified by Storey (2000) is to assess whether after the training intervention participants perform better or have stronger capabilities than before they took part in the enterprise programme. This is not the whole issue, however, because if the individuals who are receiving support are atypical in some way this may be either increasing or reducing the apparent effect of the training intervention. There is therefore a need to deal with issues related to selection bias. If selection bias is not

taken into account then any findings reflecting the impact of the training on attitudes would reflect both selection and training effects and would therefore be a biased indicator of the impact of the enterprise training.

The approach adopted in this evaluation was to establish a realistic counterfactual for those individuals who received enterprise training, and secondly to demonstrate that participants were not more likely to have greater enterprise potential prior to starting the programme. A control group was used to provide a realistic counterfactual. To enable comparisons between the control and participant groups respondents were asked for a range of demographic details, including whether either of their parents ran their own business; and ethnic background.

As questionnaires were anonymously completed a method had to found to enable the sets to be matched by individual pupil. The two sets of questionnaires were matched through a combination of gender, ethnicity, school attended, date of birth, and sometimes handwriting styles. Following missing data analysis, from the original 227 participant questionnaires collected and the 95 from the control group, a final matched sample of 200 participants and 76 non-participants made up a useable sample. The data were coded into SPSS to enable statistical analyses for the findings.

7.5 Testing the Reliability of the ATE Test.

In Chapter Four it was explained how the Cronbah alpha calculates how well each item correlates with the rest and how well it correlates with the scale overall. The Cronbach alpha score for an entire scale represents the extent to which the scale is internally reliably, that is how well the items correlate with each other. Based on previous research and recommendations by respected commentators, as discussed in Chapter Four, the threshold of reliability selected for use in this study was 0.7. Therefore all scales had to reach a coefficient of at least 0.7 to be included in the instrument to ensure confidence in the findings of the evaluation. All six items for each scale were submitted for the calculation of the coefficient alpha.

Table 7.1 Cronbach's Alpha scores for subscales by data collection stage

Subscale	Number of items	Cronbach alpha at pre-test	Cronbach alpha at post-test
Attitudes towards creativity	6	0.71	0.70
Attitudes towards achievement in project work	6	0.87	0.88
Attitudes towards control over career	6	0.77	0.77
Attitudes towards leading others	6	0.72	0.74
Attitudes towards using intuition in problem solving	6	0.70	0.74

In Table 7.1 the Cronbach alphas are presented for each sub-scale at the pre-test stage (column three), and for the post-test stage (column 4). The Cronbach's alphas show that the sub-scales consistently met the threshold of 0.7, proving that each subscale was internally reliable over time. All the sub-scales reached the threshold of 0.7 at both stages of the study. There were some differences, however, as three of the scales improved while one showed less internal reliability; though these differences were minimal. The 'intuition' subscale was at the 0.7 threshold at the pre-test stage, but this improved to 0.74 at the post-test stage. The 'creativity' subscale, which was over the 0.7 threshold at the pre-test stage (0.71) actually dropped slightly to 0.7 at the post-test stage. Given the consistency of reliability over time, however, it was decided to retain all the subscales for the analysis of the main pre and post test study. The remaining sub-scales exceeded the threshold set and the strongest scale over both stages was the 'achievement' scale with an Conbach alpha of 0.87 at the pre-test and 0.88 at the post-test stage. Following the reliability analysis the main analysis of the impact of participating in a YE Company Programme was undertaken. In Chapter Four is was noted that ideally a test-retest reliability process should be carried out, but this proved not to be feasible during the pilot studies given the difficulties of access to pupils in many different schools. However, this study has in fact been able to resolve this as Table 7.1 demonstrates consistency in reliability across time.

7.6 Sample Profiles of the Participant and Control groups

The six participating secondary schools were all located in London: two were in south London, two in west London and two in the east of London. There were two state comprehensive girls' schools; one selective voluntary aided boys' school; one co-educational independent school, and two co-educational state comprehensive schools. One girls' Church of England Comprehensive in west London was a specialist language school of average size with a diverse intake. Over half the pupils were from minority ethnic groups. Attainment on entry was above average and there were lower than average numbers of pupils with learning difficulties. Another girls' comprehensive school, situated in South London, was a specialist in science and also had diverse intake. Overall, attainment on entry was also above average. The boys' voluntary aided school in South London was selective and attainment on entry very high. The co-educational independent school also selected pupils by means of an entrance exam. GCSE attainment at these four schools was above the national average.

The two co-educational comprehensive schools located in the east London were both large with a very ethnically diverse in-take. They also had above average levels of pupils eligible for free-school meals and pupils with learning difficulties. A high proportion of pupils at both schools also had English as a second language. GCSE attainment at these two comprehensives was well below average. Participant and control groups were drawn from all six secondary schools.

According to Storey (2003; 2000) a key objective in having a control sample is to provide a realistic counterfactual to isolate the impact of participating in a programme. In this case the programme outcome to be investigated was young peoples' attitudes towards enterprise and their enterprise potential as measured by the ATE test. The control group is necessary to ensure those individuals who received enterprise training were not atypical and, in particular, to demonstrate that participants were not more likely than non-participants to have significantly higher levels of enterprise potential than the control groups. To make these comparisons it was necessary that the two samples have similar demographic characteristics to control for other factors which could have a potential impact on attitudes (such as

having a parent in business). The demographic factors which were controlled for in this way across the two samples were:

1. Having at least one parent who ran their own business.
2. Gender
3. Age
4. Type of school (selective or not).
5. Ethnic background

Differences in the demographic characteristics of the two groups were measured using Chi-square tests. Table 7.2 shows that there were no significant differences between the participant and the control group in three of the demographic categories: age; ethnic background and having at least one parent in business. However, there were significant differences across gender and type of school attended. The non-participant group had a greater proportion of males and a smaller proportion of females than the participant group. There was also a smaller proportion of pupils attending selective schools, and a larger proportion of pupils attending non-selective schools in the participant group compared with the control group. This means that any significant findings regarding type of school attended or gender needs to take this bias into account.

Table 7.2 Sample Profile

Respondent Characteristics		Total	Company Programme Participant	Non-participant (control group)	Significance (chi-square)
Age	15-16	111	79 39.5%	32 42.1%	
	17-18	165	121 60.5%	44 57.9%	
	Total	276	200 100%	76 100%	0.784
Gender	male	152	102 51.0%	50 65.8%	
	female	124	98 49.0%	26 34.2%	0.031*
	Total	276	200 100%	76 100%	
Ethnic background					
	ethnic-minority	163	117 58.5%	46 60.5%	0.786
	white	113	83 41.5%	30 39.5%	
	Total	276	200 100%	76 100%	
Type of school					
	selective	60	37 18.5%	23 30.3%	0.049*
	non-selective	216	163 81.5%	53 69.7%	
	Total	276	200 100%	76 100%	
Parents in business					
	yes	104	80 40.0%	24 31.6%	0.213
	no	172	120 60.0%	52 68.4%	
	Total	276	200 100%	76 100%	

* *significant at 0.05 level*

A second method used to control for sample bias was to test for significant differences in the enterprise potential of the participant and control groups, prior to the start of the Company Programme. If the participant group had significantly greater levels of enterprise potential compared to the control group then obviously any uplift in enterprise potential following participation could not be attributed solely to the programme. Similar comparisons were also made between the two groups' future intentions to run a business, along with a range of other employment options. Respondents were asked to indicate on a scale of 1–7 how likely it was that they would be employed in one of five options in six years time. The five options were:

1. Work for a large organization.
2. Work for a small business.
3. Be self-employed/run own business.
4. Professional occupation.
5. Unemployed.

The comparisons between the participant and control groups were made using T-tests to establish whether any differences were significant and, in particular, whether the participant group had higher levels of enterprise potential and whether they were also more likely than pupils in the control group to have intentions towards starting their own business in future.

Findings showed that there were no significant differences between the levels of enterprise potential between the two groups (Table 7.3). Furthermore, participants in Company Programme were actually slightly less likely to express their intentions to start their own business in future however, the difference was not significant. The highest possible score on the ATE test is 210 and participants scored an average 125.1, while non-participants in the control group scored an average of 124.1. Therefore, these tests have shown that the participant sample was not biased in favour of pupils with greater enterprise potential, and desire for business ownership. It , therefore, that any changes in enterprise potential after the Company Programme can now be more confidently attributed to participation.

Table 7.3 Mean ATE Test scores and work intentions prior to Company Programme

Attitudes to work and enterprise	Company Programme Participant n=200	Non-participant (control group) n=76	Significance (T-test)
Mean ATE test scores (max. score = 210 min. score = 30)	125.1	124.1	0.432
Work intentions:			
large organisation	4.81	4.99	0.435
small organisation	2.99	3.19	0.370
own business	3.17	3.46	0.229
professional career	5.59	5.43	0.490
unemployed	1.45	1.62	0.292
(scale 1-7)			

7.7 Findings of the Evaluation Study

7.7.1 Introduction

As outlined above and detailed in the literature review a number of demographic characteristics have been found to be closely correlated with young people's attitudes towards business ownership. To recap, pupils at selective schools, and those with a parent in business have been found to be more likely to aspire to business ownership themselves. To examine the potential impact of these and other demographic variables, an analysis of variance (ANOVA) was calculated to compare the average ATE test scores of different groups. In this ANOVA the dependent variable was ATE test scores, while the independent variables included: ethnic background; type of school attended; intended participation in Company Programme; gender; having at least one parent in business; and age.

The results of the ANOVA confirm the findings from the T-test regarding the impact of intentions to take part in the Company Programme on ATE test scores (Table 7.4): those pupils intending to participate did not have significantly higher ATE test scores than pupils not intending to take part. There were, however two significant

differences in scores for two of the demographic variables: type of school attended and having at least one parent in business.

Table 7.4 Pre-Test Analysis of Variance Tests using ATE Test (N-276)

Univariate Tests of Significance	*F*	*df*	*Sig.*
Overall Model	12.536	8	0.000**
Age	0.027	2	0.869
Gender	1.356	2	0.244
Company Programme	2.612	2	0.107
Self-employed Parent	8.063	2	0.005*
Ethnicity	1.417	3	0.238
Type of school	59.224	2	0.000**

** significant at 0.05 level. ** significant at 0.001*

Table 7.5 ATE Test Mean Scores by Group

Groups		*Group Mean Scores**	*N*
All		125.35	276
Age:	15-16	124.80	111
	17-18	125.72	165
Gender:	male	128.92	152
	female	120.97	124
Company Programme	participant	125.98	200
	non-participant	123.69	76
Self-employed parent		139.05	104
No parent self-employed		122.51	172
Ethnicity:	mixed	119.63	61
	Asian	125.67	43
	Black	120.22	59
	White	131.00	113
Type of school:	selective	144.95	60
	Non-selective	119.91	216

*maximum score = 210, minimum score = 30

Pupils attending schools which selected on the basis on entrance exams scored significantly higher on the ATE test (144.95) than pupils at non-selective schools (119.91) (Tables 7.4 and 7.5). Furthermore, pupils with at least one parent in business also achieved significantly higher scores on the ATE test (139.05) than pupils with no parents in business (122.51) It may be remembered that previous research found that pupils at private schools were more likely to aspire to business ownership than pupils at state schools (Curran and Blackburn 1990). To establish whether there was any significant relationship between pupils at selective schools and pupils with a parent in business, a Chi-square test was carried out. However, this test showed that pupils at selective schools were not any more likely than their peers at non-selective schools to have a parent in business. (p= 0.166).

It may be the case that pupils at selective schools were more likely to aspire to a profession where self-employment is common such as an architect, lawyer or accountant. Therefore, a T-test was carried out to establish whether this was the case. The results of the T-test did in fact show that pupils at selective schools were significantly more likely to aspire to professional careers than pupils at non-selective schools (p= 0.000).

The implications of these findings are that the impact of participation in Company Programme is not the only potential factor which may influence attitudes towards business ownership or levels of enterprise potential. Analysis of the impact of other factors on enterprise potential will therefore also need to be carried out following pupils' participation on the programme.

7.7.2 The Impact of the Company Programme on the Enterprise Potential of Young People

The first set of hypotheses to be tested concerned the impact of taking part in Company Programme on the entrepreneurial potential of young people, as measured by the ATE test, and in particular, whether it had increased as a result of participation. To test whether participation in the YE programme had any impact on young peoples' attitudes towards enterprise, ATE test scores of participants, prior to taking part, were compared with their scores after taking part. In the case of the

control group who were not participating, their scores at the pre-test and post-test stages were also compared, to allow for changes in attitudes over time, and other possible influences such as the curriculum, after-school activities, social activities, media, and so on. The aim was to isolate, as far as possible, the effect of participation in the programme. The sets of scores were then compared to find out whether taking part in the programme had significantly influenced participants' attitudes, when compared to the control group.

A simple T-Test analysis was undertaken initially, to assess differences in mean ATE test scores, before and after the Company Programme. The results are presented in Table 7.6. The results showed that though both groups' mean scores on the ATE test had increased at the post test stage compared with the pre-test stage, the difference in mean scores was significant only for the participant group. The average pre-test ATE score of the participant group rose from 126.0 at the pre-test stage to 143.8 at the post-test stage, whereas the average score for the control group rose from 123.7 to only 129.7at the post-test stage.

This finding showed that overall, participation in the Company Programme was associated with a significant increase in enterprise potential as measured by average ATE test scores.

Table 7.6 Independent samples tests for ATE test scores by participation

	Pre-test mean scores*	Post-test mean scores*	Significance (T-test)
Participants n=200	126.0	143.8	0.000***
Non-participants n=76	123.7	129.7	0.69

. *significant at 0.001 *Max score = 210.*

Following on from the analysis undertaken at the pre-test stage, which highlighted the impact of other demographic factors on enterprise potential, further multivariate analysis was carried out on post-test ATE scores. To investigate the impact of other demographic factors on the ATE test scores an analysis of variance (ANOVA) was carried out. The dependent variable in this case was ATE test scores and the

independent variables were: participation in YE Company Programme; gender; age; ethnic background; type of school attended (selective/non-selective); and having at least one parent in business for themselves.

The first important significant finding to emerge was that participation in Company Programme was still correlated with an increase in ATE test scores, even after taking into account the potential influence of other factors that may impact on enterprise potential (Tables 7.7 and 7.8). These potential influences included three demographic factors which were also found to be associated with an increase in scores at the post-test stage. At the pre-test stage attending a selective school and having a parent in business, were both associated with higher ATE test scores. Both these factors were also associated with higher ATE test scores at the post-test stage, and a new variable gender also emerged as a significant factor. Boys' scores were significantly higher than girls' at the post-test stage. However, ATE test scores for both girls and boys were significantly higher at the post-test stage compared to the pre-test stage.

Table 7.7 Post-Test Analysis of Variance Results for ATE Test Scores (N-276)

Univariate Tests of Significance	*F*	*df*	*Sig.*
Overall Model	21.947	8	0.000**
Age	0.770	2	0.381
Gender	7.252	2	0.008**
Company Programme	37.133	2	0.000**
Self-employed Parent	10.367	2	0.001**
Ethnicity	1.243	3	0.295
Type of school	92.791	2	0.000**

** significant at 0.05 level. ** significant at 0.001*

Finally, having a parent in business, which the literature review showed to be correlated with business ownership in several studies, was also found to be correlated with ATE test scores. Though scores increased for pupils both with and without parents in business, those with at least one parent in business scored significantly higher than those without (Tables 7.7 and 7.8).

Table 7.8 Pre and Post-test ATE Test Mean Scores by Group

Groups		Pre-test Group Mean Scores	Post-test Group Mean Scores	N
All		125.35	139.90	276
Age:	15-16	124.80	138.80	111
	17-18	125.72	140.65	165
Gender:	male	128.92	142.00	152
	female	120.97	137,33	124
Company Programme		125.98	143.77	200
participant		123.69	129.73	76
non-participant				
Self-employed parent		139.05	145.85	104
No parent self-employed		122.51	136.31	172
Ethnicity:	mixed	119.63	128.85	61
	Asian	125.67	142.48	43
	Black	120.22	138.47	59
	White	131.00	145.64	113
Type of school:	selective	144.95	162.71	60
	Non-selective	119.91	133.57	216

As reported in the literature review, academic attainment has been found to be closely associated with socio-economic groups, with pupils from higher socio-economic groups achieving considerably better grades at GCSE than pupils from lower socio-economic groups. Analysis of scores by socio-economic groups was therefore also carried out using occupational categories based on the National Statistics Office Socio-economic Classification system. The occupational categories used included: professional, higher managerial, lower managerial and technical, intermediate, semi-routine and routine. The intermediate, semi-routine and routine include clerical, administrative, sale, service, childcare, operative and agricultural occupations.

It was decided to investigate the associations between economic groups and ATE test scores at the post-test stage. Two ANOVAs were calculated for first fathers 'occupations and then for mothers' occupations. Results showed that there were significant differences between ATE test scores according to pupils' socio economic

groups based on both parents' occupations. Pupils with fathers in higher managerial occupations scored the highest on the ATE test with 148, while pupils with fathers in intermediate and semi-routine occupations had the lowest scores at 130 (Tables 7.9 and 7.10). The relationship between ATE test scores and socio-economic group however, is not as straightforward as that between these groups and academic attainment. In the latter case the higher the socio-economic group a pupils' family belongs to, then the better the pupil's grades at GCSE. Interestingly, pupils with fathers in routine occupations, the least skilled group scored 135 on the ATE test higher than pupils with fathers in either intermediate or semi-routine occupations. This indicates that enterprise potential is not correlated with socio-economic group, which bears out many of the anecdotal stories of successful entrepreneurs from deprived backgrounds (e.g. Chell 2008). Further research would need to be undertaken to firstly replicate these findings, and then to develop explanations for them.

Table 7.9 Post-Test Analysis of Variance Results for ATE Test Scores by Parents' Occupations (N-276)

Univariate Tests of Significance	*F*	*df*	*Sig.*
Overall Model	5.189	10	0.000**
Father's occupation	3.377	5	0.006*
Mother's occupation	5.102	5	0.000**

** significant at 0.05 level. ** significant at 0.001*

Table 7.10 Post-test ATE Test Mean Scores by Fathers' Occupation

Occupations	*Pre-test Group Mean Scores*	*Post-test Group Mean Scores*	*N*
Professional	128.52	143.28	46
Higher managerial	131.66	148.63	83
Lower professional and technical	124.53	138.06	44
Intermediate	119.44	131.82	40
Semi-routine	117.09	130.75	41
Routine	122.50	135.36	22
All	125.35	139.90	276

The results for mothers' occupations were more straightforward and similar to the relationship between socio-economic groups and academic achievement. Pupils

with mothers in higher managerial positions scored highest on the ATE test and those with mothers in routine occupations scored the least (Table 7.6). With a larger sample more detailed analysis could be carried out using more categories within the socio-economic classification system. For instance, these categories are also broken down by self-employment and size of business, as well as sectoral categories.

The aim of this exercise was really to demonstrate the kinds of analysis that can be carried out using the ATE test, and the flexibility and depth that a research tool like this adds to the analysis. With larger sample sizes, particularly in individual cells, more in-depth analysis could be carried out.

Table 7.11Post-test ATE Test Mean Scores by Mothers' Occupation

Occupations	*Pre-test Group Mean Scores*	*Post-test Group Mean Scores*	*N*
Professional	139.21	154.33	30
Higher managerial	137.26	153.93	15
Lower professional and technical	123.48	139.56	46
Intermediate	129.36	142.79	83
Semi-routine	118.19	132.47	87
Routine	113.86	125.26	15
All	125.35	139.90	276

The ATE test can also be used to make comparisons with other dependent variables, to provide a more complete picture of young people's attitudes towards their future working life and career aspirations. In particular, the more objective measure of young people's enterprise potential provided by the ATE test can be usefully compared to subjective measures such as their stated future employment intentions, particularly intentions to run their own business. It may be remembered that respondents were asked to indicate on a scale of 1-7 how likely it was that they would be employed in one of five options in six years time. The five options were:

1. Work for a large organization.
2. Work for a small business.
3. Be self-employed/run own business.
4. Professional occupation
5. Unemployed.

To investigate pupils post-test employment intentions a multivariate analysis of variance (MANOVA) was calculated. The dependent variables were the five employment options, and the independent variables were those previously used to investigate ATE test scores: ethnic background; type of school; participation in Company Programme; gender; having a parent in business; and age. Given the amount of statistical information generated by the MANOVA, it was decided to report only the level of significance for each finding for ease of reading and to enable comparisons to be made (Table 7.12).

Significant differences in future employment choices were found in two demographic groups: ethnic background and type of school; and in participation in Company Programme (Table 7.12). At this post-test stage participants in Company Programme were more likely than the control group to aspire to run their own business in future. This can be compared with the pre-test group, where there was no significant difference between the two groups. Participants also attained significantly higher ATE test scores, therefore, it can be argued that they also have the right attitudes for starting and running their own business.

When it comes to type of school attended, there were significant differences in two of the employment choices: working for a large organisation and running your own business in future. Pupils at selective schools were more likely to envisage themselves working for a large organisation in future than pupils at non-selective schools. In contrast, pupils at non-selective schools were more likely to aspire to run their own business. To check whether it was the impact of participating in Company Programme which was related to this finding. T-tests were calculated to assess differences in employment options by participants and the control groups. Findings confirmed that pupils at non-selective schools who had participated were more likely to aspire to run their own business following the programme. By comparing these results with ATE test scores (Table 7.8) it can be seen that there is a gap between the aspirations for business ownership of pupils at non-selective schools and their enterprise potential. The enterprise potential of pupils at non-selective schools was only 130 compared to 162 for pupils at selective schools, following participation in the programme.

A similar story emerges from the results for employment choices by ethnic background. Here Black pupils were more likely to aspire to future business ownership than other groups (Table 7.12), however their ATE test scores were the second lowest following the programme (Table 7.8). Black pupils were also more likely to envisage unemployment in future than any of the other groups. It may be the case that the attraction of owning their own business for some Black pupils is a reaction to a perceived danger of unemployment, and therefore 'push' factors rather than 'pull' factors are at work. Once again further research with larger samples, particularly of individual ethnic groups, is needed to explore the implications of these findings more fully. In this study the categories of Black British, African and Afro-Caribbean have been collapsed, which may have the effect of masking important and significant differences between these groups.

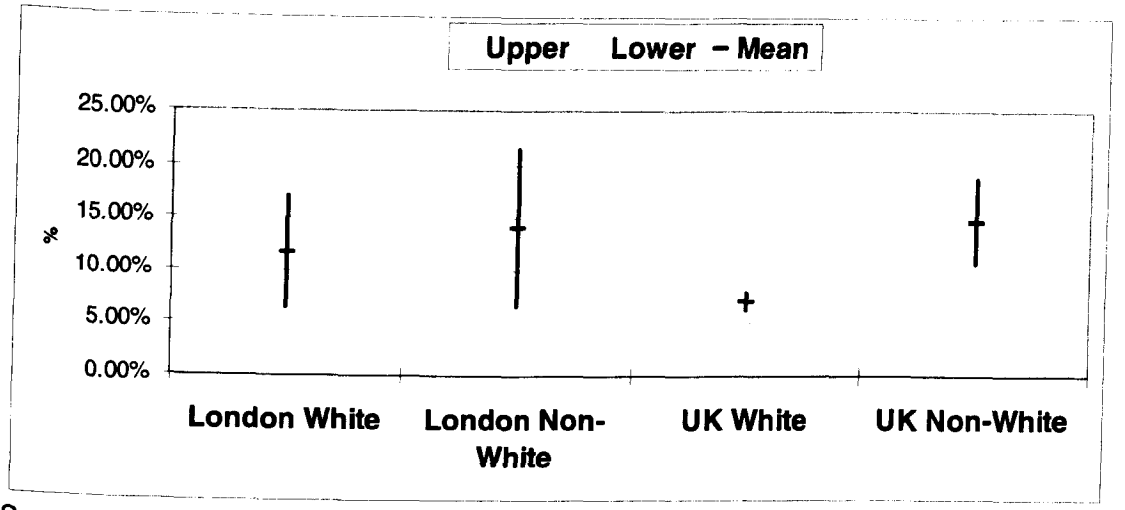
Table 7.12 Impact of Demographic Variables on Anticipated Career in 6 Years Time: Tests of between subjects effects (multiple analysis of variance)

	Ethnic background	*Type of School*	*Company Programme*	*Gender*	*Parent in business*	*Age*
Significance for dependent variables overall	*0.000***	*0.000***	*0.046**	*0.024**	*0.596*	*0.816*
Large organisation	0.169	0.045*	0.547	0.675	0.678	0.287
Small organisation	0.011*	0.044	0.987	0.010*	0.515	0.870
Own business	0.004	0.000**	0.002**	0.998	0.743	0.360
Professional	0.369	0.671	0.693	0.304	0.474	0.720
Unemployed	0.001**	0.226	0.459	0.149	0.264	0.489

** significant at 0.05 level. **significant at 0.001 level*

However comparisons with the findings from the GEM surveys can be made using these findings of career choices of different, albeit broad, ethnic groups. Evidence from the GEM study in 2004 shows that the non-white population were more likely to have intentions to start their own business than the non-white population, and this difference was also evident in London, though to a lesser extent (Figure 7.4). In the UK 7.12 *per cent* of the white sample had intentions to start a business compared with 14.76 *per* cent of the non-white population. In London 11.73 *per cent* of the white sample had intentions to start a business compared with 14.06 *per cent* of the non-white sample Figure 7.4 shows the point estimates (the short horizontal bars) and 95% confidence intervals (the vertical bars) for each main (aggregated) ethnic group in the UK. This greater propensity for self-employment among ethnic minority groups in London was also demonstrated.

Figure 7.4 Start-up Intentions by Ethnic Background (GEM 2004)



Source: GEM UK 2005

Research studies have repeatedly demonstrated the unique innovative and entrepreneurial nature of London (e.g. Burke *et al.* 2008; Levie and Hart 2009; Simmie and Sennett 1999). Furthermore evidence from the Annual Population Surveys (APS) since 2004 show that in each year the rate of self-employment in London was significantly higher than in the rest of England and the UK as a whole. The recent GEM survey (Levie and Hart 2009) also identified London as a unique location in terms of its levels of entrepreneurial activity. Though the UK overall has only a medium level of TEA (5.98%), in London the TEA rate is much higher (8.48%) (Figure 5.3).

Disaggregating the start-up intention rates in GEM 2004 by ethnic background provides a deeper analysis and provides more evidence about the unique entrepreneurial character of London (Figure 7.4). The difference between the start-up intention rate of White versus non-White people is greater in the UK as a whole (by 7.64%), than in London (where the difference is only 2.33%). Overall, therefore individuals in London, no matter what their ethnic background, have a greater propensity for starting a business than in the rest of the UK. However, ATE test score results would suggest that there are differences in the levels of enterprise potential between pupils from different ethnic backgrounds, though these differences were not significant (Table 7.7). In which case perhaps there may be another

explanation for these differences in ATE test scores, that relates to the type of school attended. It may be remembered that pupils attending selective schools scored significantly higher on the ATE test than pupils attending non-selective schools. It was therefore decided to look at the ethnic composition of pupils from both types of school. Chi-square tests were then carried out to determine whether any differences were significant.

Table 7.13 shows that that there are in fact significant differences in the ethnic composition of the pupils at selective and non-selective schools. There were no pupils from mixed ethnic backgrounds attending a selective school, and this group had the lowest ATE test score, whereas these pupils made up 28.2 *per cent* of the non-selective schools sample. There was also a greater proportion of Black pupils attending non-selective schools compared with selective schools. Over two thirds of the selective school sample were White compared to only one third of the non-selective sample. At only 60 cases however, the selective sample is small compared to 216 in the non-selective sample, nevertheless these findings provide some evidence of the complexity involved in the factors which may influence levels of enterprise potential in young people. In future, more studies are needed which have larger samples to provide more scope for multivariate analyses of the different factors involved. Such an approach would enable a more accurate analysis of the impact of participating in an enterprise programme by better isolating this impact from other factors.

Table 7.13 Independent samples tests for ATE test scores by participation

	Selective schools		Non-selective schools	
Mixed	0	0%	61	28.2%
Asian	11	18.3%	32	14.8%
Black	8	13.3%	51	23.6%
White	41	68.3%	72	33.3%
All	60	100.0%	216	100.0%

Chi-square 33.68 (3 df) Significance = 0.000***

7.8 Summary and Conclusions

The aim of this chapter was to demonstrate how an evaluation tool such as the ATE test can be used to evaluate the impact of participation in a YE Company programme on young people's attitudes to enterprise and on their enterprise potential. The added value of such an evaluation tool, it has been argued, is that it can facilitate a research design that meets the criticisms of many previous evaluations of enterprise initiatives (by for instance: Levie *et al.* 2009; Hytti and O'Gorman 2004; Peterman and Kennedy 2003; Westhead *et al.* 2001; Storey 2003; 2000). The main weaknesses identified by these researchers are a lack of longitudinal research; a lack of techniques to isolate the impact of participation such as control groups, not controlling for self-selection, and not taking account of the impact of context.

This evaluation study has sought to address these weaknesses through the use of the ATE test in the research design. This enabled control groups and participating groups to be directly compared as the data collected was the same in each case. It also enabled a longitudinal design that made use of pre and post participation testing, which could also be directly compared through ATE test scores. Self-selection bias was partially controlled for by comparing the ATE test scores and future career intentions of the participating group and the control group (non-participating). If the participating group were significantly more likely to have higher ATE test scores and/or were significantly more likely to aspire to own their own business then this would indicate that the samples were biased. However, tests showed that there were no significant differences between the two groups in either ATE test scores or a desire for business ownership, at the pre-test stage. Furthermore, by carrying out multivariate analyses using ANOVAs and MANOVAs the impact of the programme on young people's enterprise potential could be isolated by taking into account a range of other potential factors which may have influenced this potential. In fact, it was found that other factors, apart from the enterprise programme, were correlated with significantly higher ATE test scores. These analyses were guided by a series of hypotheses that were developed and presented in section 7.3 on the research questions.

The first two hypotheses stated that participants' scores would be higher than non-participants (the control group), and the participants' scores would be significantly higher after participation in the YE Company Programme compared to their scores before the programme. Both hypotheses proved to be correct and the study showed that participation in the programme was correlated with significantly higher ATE test scores. This demonstrates that the YE programme fulfils the aims of increasing enterprise capability, which replicates the findings of Peterman and Kennedy (2003) in Australia. Peterman and Kennedy (2003) also found that taking part in a YE Company Programme (the Australian equivalent) increased enterprise capability in young people.

The next four hypotheses related to future career intentions and whether young people aspired to work in large or small organisations, run their own business, work in a professional occupation or become unemployed. It was hypothesised that the desire for future business ownership would differ between males and females; between pupils with a family background of business ownership and those with no such background; between pupils at selective and non-selective schools; between pupils from different ethnic backgrounds; and finally between the control and participating groups. In fact only three of these hypotheses proved to be correct. Attending a non-selective school, having a Black ethnic background, and participation in the YE programme were all correlated with a desire to run a business in the future. Comparing these results with ATE test scores revealed disparities between a desire for business ownership and pupils' enterprise potential. Pupils attending non-selective schools and those from a Black ethnic background actually scored significantly lower on the ATE test than their counterparts. Such information could be helpful to programme providers and to policy makers, by indicating where the need for such enterprise programmes is greatest. This could help improve the targeting and marketing of enterprise education in schools.

The final four hypotheses related to differences in ATE test scores. It was hypothesised that scores would differ between males and females; between pupils with a family background of business ownership and those with no such background; between pupils at selective and non-selective schools; between pupils from different ethnic backgrounds; and finally between the control and participating groups. Pupils

who participated in the YE programme, those attending selective schools, those with at least one parent in business, and males had significantly higher ATE test scores. Once again this kind of information could provide valuable feedback to providers and policy makers, by indicating who currently benefits the most from enterprise programmes and which groups could benefit even more.

This chapter has shown the added value that could be provided through using the ATE test in evaluation studies of enterprise programmes in secondary schools. One of the main weaknesses of this study was the small sample sizes, which limited the depth of multivariate analyses that could be carried out. In future studies should aim for larger samples depending on the level of analysis needed and the number of additional independent variables, such as ethnicity, that need to be taken into account. Finally, although studies using the ATE test provide statistical evidence which may be useful to policy makers in particular, there is a case for using it alongside a qualitative approach, that includes interviews and focus groups, to provide greater insight into young peoples' perceptions and aspirations.

Chapter Eight: Conclusions

8.1 Introduction

The aim of this thesis has been to show how the development of an original evaluation tool could make a contribution to the evaluation of enterprise education programmes, targeted at young people still at school. The need for the tool, it has been argued, stems from: firstly, the widespread increase in enterprise programmes for young people, internationally and in the UK; secondly, a lack of independent evaluations; and thirdly the need for such evaluations to meet certain methodological criteria (Levie et al. 2009; Greene 2005; Hytti and O'Gorman 2004; Peterman and Kennedy 2003; Westhead et al. 2001; Storey 2000). The main weaknesses identified by previous researchers are the need for longitudinal research; techniques to isolate the impact of participation such as control groups; controlling for self-selection, and taking account of the impact of context.

A review of entrepreneurship studies showed that though there is a considerable literature on attitudes to enterprise in adults, under graduates and post graduates there is very little research carried out with young people still at school. I have argued that the policy focus on enterprise, particularly targeted at schools, is based on little empirical evidence into the concept of "enterprise", what it might mean to young people, and, importantly how it can be measured. In response to this lack of evidence, I developed a new multi-dimensional scale to measure attitudes to enterprise in young people. This thesis has reported the results of repeated testing of the tool in varied educational settings.

The ATE test can provide a practical method of testing the efficacy of the many enterprise initiatives in schools, colleges and universities, whilst allowing for the control of other situational and demographic factors. For instance, evaluations using the tool can provide programme providers with detailed feedback on the impact of programmes, on different target markets. In the longitudinal evaluation undertaken some light was shed on the differences in the enterprise potential of varying ethnic minority groups. Black pupils were found to have the lowest enterprise potential, but were also more likely to aspire to run their own business in future. This indicates a potential gap between their abilities and their aspirations.

Such information is of interest to enterprise education providers, who could potentially modify their programmes for this group, for instance to include Black role models and facilitators.

Following a presentation at the ISBA conference in Belfast in 2003, on the development of the test, I was approached by several academics and practitioners for permission to use the test. Subsequently, the test has been used in Canberra Australia, by a PhD student at the Australian graduate School of Entrepreneurship, and by the North West University in South Africa to measure pupils' attitudes to enterprise in secondary schools. Following this, the North West University will be using the test once again in a longitudinal evaluation of programmes run by the Nelson Mandela Foundation.

An undergraduate version of the test has also been developed, which incorporates language and contexts suited to students rather than school pupils. This test is currently being used by Kettering University in Michigan U.S. to evaluate their entrepreneurship programme, by the University of Zagreb in Croatia, and by the College of North Atlantic, Dohar, Qatar. The University of Seville, Spain and Kansas State University have also been given permission to use the test. The test is also being used in an evaluation of a pilot enterprise programme in Ethiopia run by an NGO 'Enfuseyouth' and Kingston University. This evaluation is using a combination of quantitative and qualitative methodologies, to provide evidence of the effectiveness of this programme, with a view to developing a model programme that could be replicated in other African countries. Most recently, agreement has been reached for the test to be used by the Technical University of Lisbon in Portugal.

This ATE test has also been used in an evaluation of the West Focus Bright Futures Programme in 2009/2010. The aim of the evaluation was to measure the impact of participation in the Bright Futures Programme on levels of participant students' enterprise potential. The project was supported by a research grant from the Higher Education Entrepreneurship Group (HEEG) in the South East.

Following the ISBA conference I was also invited to give a presentation at the United Nations Economic Commission Working Party on Youth Entrepreneurship in

Geneva, Switzerland in 2004. An article charting the initial development of the test was published in Entrepreneurship Theory and Practice in March 2009, and a paper on the development of the second version of the test has been submitted to the Journal of Business Venturing. Finally, papers, based on the South African data, have been submitted to two journals in South Africa, one a management journal, and one an education journal.

In carrying out this research I had a lot to learn, particularly about the complexities of test construction. This learning has contributed to my skills as a researcher, and in particular was very applicable to a recent project I worked on with Professor Elizabeth Chell commissioned by the National Foundation for Science, Technology and the Arts (NESTA). This project was the development of a tool to measure innovative characteristics in young people (Chell and Athayde 2009).

In addition to these practical outcomes of the research, a number of theoretical contributions have also been made. The following section describes the evolution of the final conceptual framework as it developed from the original simple model of enterprise potential, with which the research began. Included in this is a summary of the empirical research and findings. By using concepts from entrepreneurial self-efficacy theories, combined with elements of attitude theory, a more sophisticated model of enterprise potential in young people was developed. This model has evolved throughout the course of this research project, from a simple description of five key dimensions associated with enterprise potential, to a more complex model which demonstrates the causal relationships between positive attitudes and levels of entrepreneurial self-efficacy.

A further theoretical contribution is presented in section three, which revisits the literature reviews on enterprise education, and presents a model of enterprise education, which combines both the conceptual and empirical findings of this research. Finally, the closing section assesses the contribution made by this research project to the debate surrounding enterprise education for young people.

8.2 The Evolution of the Conceptual Model

The 'Attitude Towards Enterprise Test' (ATE Test) was based initially on the Entrepreneurial Attitude Orientation (EAO) scale (Robinson *et al.* 1991). The theory of planned behaviour, in which attitudes are a necessary antecedent for intentional behaviour, underpins the scale (Azjen 1991). According to previous research attitude instruments tend to account for more of the variance in a particular set of behaviours than personality dispositions, or trait based instruments, and therefore are a better measure of the object under investigation than are personality traits. (Azjen 1991). One of the methodological advantages of an attitude model over a personality trait model is that it can be more domain specific, thereby reducing the unexplained variability and increasing the correlation with behaviour (Azjen 1991). In this case it meant that the statements could be designed specifically with young people in mind. A range of school and classroom contexts was used to make the statements relevant to young people. This focus on attitudes was also theoretically driven and reflected the attitude component of intentional theories of entrepreneurship.

A social psychology model of the dynamic relationship between underlying personality traits and situations was useful for placing into context, the role played by attitudes, (Roberts and Pomerantz 2004). The model describes the interface of person variables with situations in terms of narrow, medium and broad contexts. At the level of the person, narrow or proximal attributes are the thoughts, feelings, behaviours and attitudes of individuals. These relationships can be usefully transplanted onto the entrepreneurial experience. In effect, when the proximal situation variables are favourable to venture creation, then a person with entrepreneurial attitudes will be more likely to start a business, than someone without such attitudes.

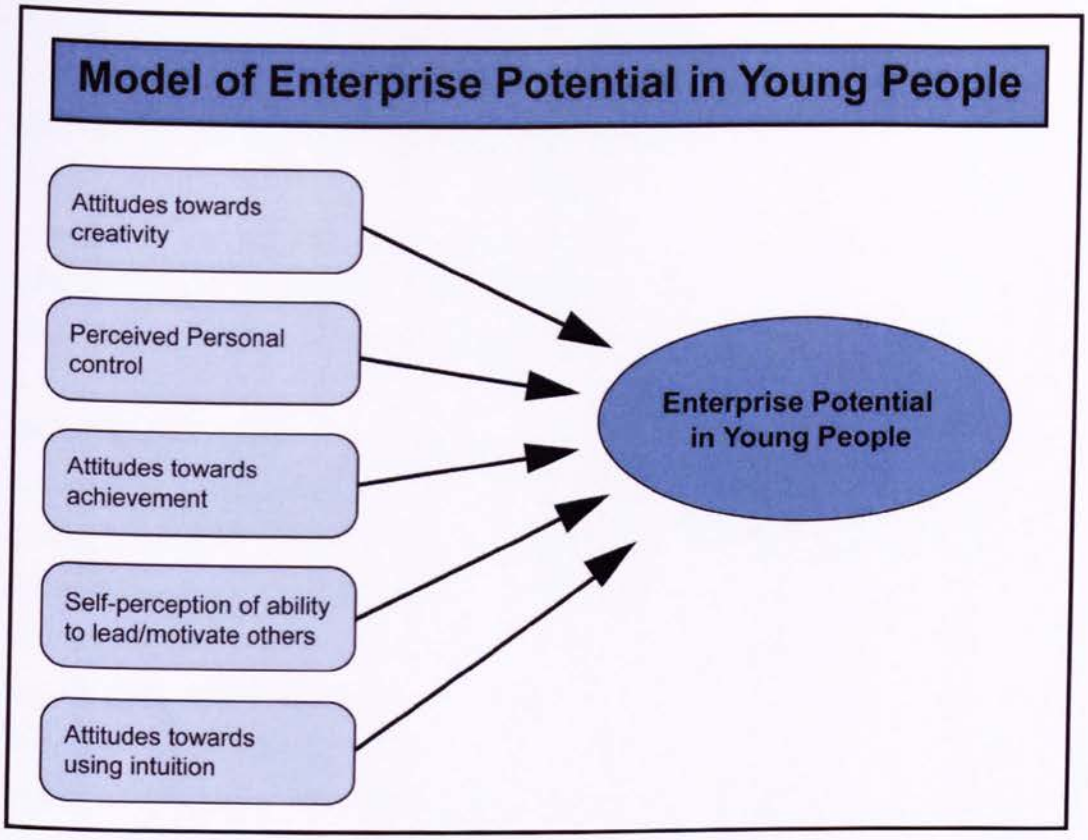
The EAO used a tripartite model of attitudes comprising three dimensions: affective (feelings towards an object), cognitive (beliefs and thoughts about an object) and conation (behavioural intentions and predispositions to behave in a certain way towards the object). The scale consists of four constructs related to entrepreneurship, including innovation, personal control, the need for achievement

and self-esteem (Robinson *et al.*, 1991). The EAO scale has been used in several studies in the U.S. (McCline *et al.* 2000; Rasheed, 2002), in Malaysia (Shariff & Saud), in South Africa (Wyk *et al.* 2003), and India (Kundu and Rani, 2008). However, while the theoretical foundations of the EAO were useful as the basis for an attitudes test for young people, the actual test was designed for use with adults. Therefore a new attitudes test was needed, designed especially for young people. This first required a conceptual framework in which to locate the design of the new instrument. Given that attitudes can be measured, and that they are central to intentional theory, it was decided to use intentional theories of entrepreneurship as a basis for the design of the conceptual framework.

Entrepreneurship is an intentional process (i.e. mental processes are key, not personality traits), and intentionality has been shown to be central to entrepreneurship (Bird 1988, Katz and Shepherd 2003). Azjen (1991) has shown that intentions can be used to predict and explain future behaviour, and that in turn attitudes will affect intentions. Krueger and Carsud (1993) has argued that attitudes influence behaviour via intentions and, as such, both are antecedents to entrepreneurial behaviour. Indeed, a growing number of studies has found links between attitudes, intentions and entrepreneurship (Mitchell *et al* 2007; Krueger and Kickul 2006; Krueger and Carsud 1993;).

The Attitudes to Enterprise test was designed to be used with young people still at school, rather than with adult entrepreneurs and, though the tripartite model of attitudes was retained, the constructs and their meanings were altered (Athayde, 2009). Altogether five dimensions, found to be key in entrepreneurship research, were defined, based on a review of relevant studies. Figure 8.1 is a representation of this initial conceptual understanding of enterprise potential in young people. It was argued that attitudes towards these dimensions could provide an indication, and therefore a measure, of the enterprise potential of young people. To the extent that positive attitudes are an indication of enterprise potential, then it is also a measure of self-efficacy. Initially a total of 90 statements reflecting attitudes towards these dimensions were generated, using the tripartite model of attitudes.

Figure 8.1 Model of Enterprise Potential in Young People



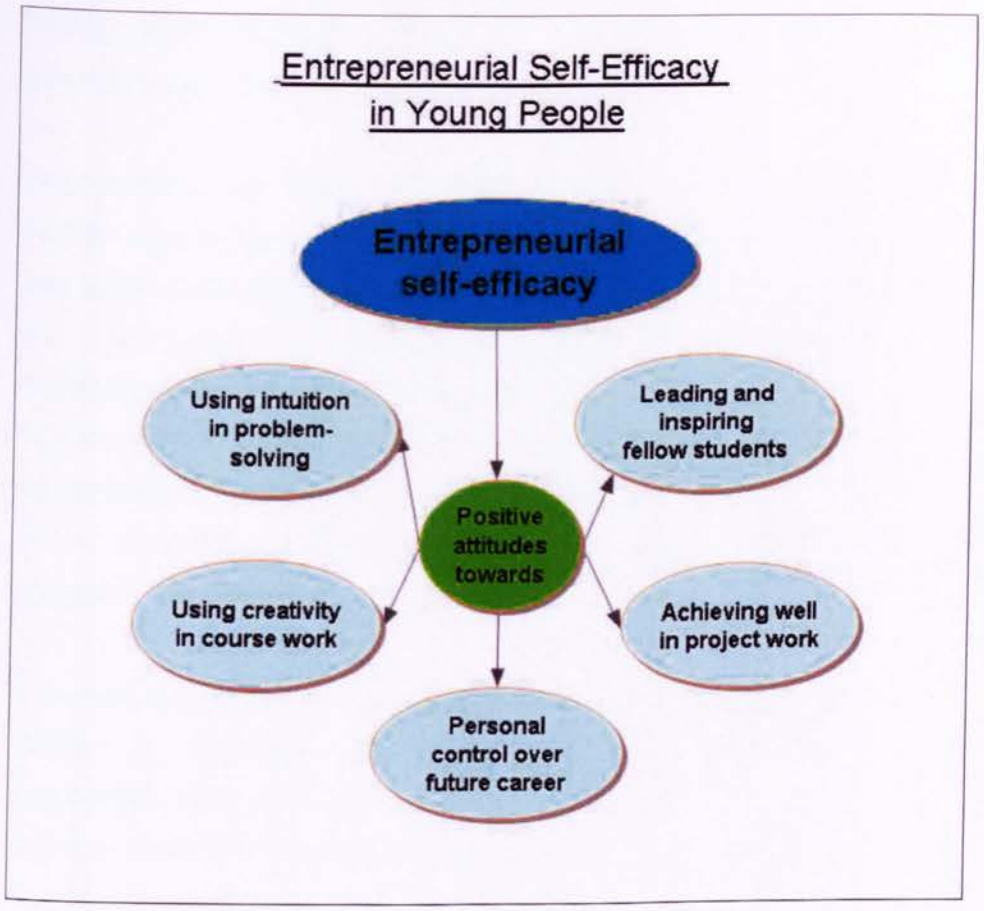
This initial version of the measure was piloted using a cohort of young people aged 16-19, and tested for reliability and validity. However, the findings from the pilot succeeded in exposing a number of methodological and conceptual weaknesses in this initial conceptual design. This in turn had led to problems generating effective statements for each construct, though some constructs namely leadership and creativity were originally well defined. Some of the statements in the remaining constructs however were neither well conceptualised, nor well operationalized. These limitations then resulted in low reliability in some constructs, and a lack of structural validity in the test as a whole. Based on these findings therefore, it was decided to re-examine the initial conceptual framework to improve the overall effectiveness of the test.

In the original conceptualisation of enterprise potential it was acknowledged that self-efficacy was an influencing factor. However, this was not built into the original design of the conceptual framework. There is increasing evidence to suggest that

self-efficacy is an important factor in the choice of entrepreneurship as a career (Chen *et al.* 1998; Krueger and Bazeal 1994). The concept of self-efficacy comes from social cognitive theory, and states that people who expect to perform well at a task, will do better than people who expect to perform badly (Gist and Mitchell 1992; Bandura 1997;1986; Bandura and Schunck 1981). It was therefore decided to incorporate self-efficacy into the conceptual framework, giving it a prominent role, which would have the potential to improve the operationalisation of the constructs, and the development of more effective statements.

This new model therefore, posits that enterprise potential can be understood through the lens of self-efficacy, as well as attitude theory. In this way the research adds to our conceptual understanding of entrepreneurial self-efficacy in young people, by interpreting it as a constellation of positive attitudes. Figure 8.2 is a graphic representation of the modified model. The model demonstrates how entrepreneurial self-efficacy in young people is a reflection of positive attitudes towards five dimensions. These dimensions, though similar to those in the original model, have been refined to take into account the need for measures of self-efficacy to be domain specific (Bandura 2006). Apart from the leadership and creativity dimensions, the original conceptualisation, as shown in Figure 8.1, was not specific, but instead vague descriptions of, for instance, attitudes towards intuition. This lack of specificity was deemed to be partly responsible for the low reliability and lack of structural validity of these constructs. The modified model in Figure 8.2, therefore was the foundation for improving the statements in each construct, and the development of version two of the ATE test.

Figure 8.2 Modified Model of Entrepreneurial Self-Efficacy in Young People



In the new model, each dimension, apart from leadership and creativity, has been re-interpreted using a specific context (domain). Leadership and creativity were the strongest constructs to emerge during the piloting of the original test, and showed good reliability and structural validity. A large proportion of the statements actually loaded on one factor. Leadership and creativity are the most tangible of the original constructs, and therefore the most easily understood. In contrast, the remaining three constructs, achievement, personal control and intuition, lacked reliability and validity and were therefore in need of modification. Figure 8.2 shows how these were modified. For each construct a specific context was developed and new statements were generated based on this context. Therefore, achievement was reinterpreted as 'achieving well in project work'. Personal control was reinterpreted as 'personal control over future career'. Finally, intuition, which had been the

weakest construct, was reinterpreted as 'using intuition in problem-solving'. As with other measures of self-efficacy, positive responses to the statements (i.e. high scores) would indicate that respondents perceived themselves to be capable in each given area (Bandura 2006; Pajares & Schunk 2001).

This modified test, which comprised 30 statements, was then piloted on a new sample of young people. Reliability and validity tests showed that this time the test was much more successful in meeting required thresholds. Therefore the new test was then used in a longitudinal evaluation of a Young Enterprise Company Programme, to further test its use, and to demonstrate the potential value of the test to evaluation methodology. During the process of modifying the test, the underlying theory and concepts were expanded to include a greater role for self-efficacy. This in turn led to the development of the original model of enterprise potential into a new and more complex model.

A further theoretical development to emerge from this research is an alternative method for mapping enterprise education. By building on the findings of the longitudinal study in Chapter Seven, I have revisited discussions from the literature reviews, concerning different ideological approaches to educational theory, including Bourdieu's theory of cultural capital. By delineating the relationships between these theories, I developed a conceptual map of enterprise education, whose coordinates are based on economic and social needs. This model reflects the evidence and the insights derived from this body of research so far. It also seeks to combine different theoretical concepts such as human and social capital, and contrasting theories about the aims of education, in a novel way. The conceptual journey to this alternative model of enterprise education follows in the next section.

8.3 Towards a New Conceptual Model of Enterprise Education

Sound theoretical and empirical foundations should, ideally, form the basis of policy development. However, given the often rapid spread of policy initiatives, the gap between evidence and policy can widen. Since this research commenced in 2002, the proliferation of enterprise education programmes has continued, driven by

increasing pressure from international bodies such as the Organisation for Economic Cooperation and Development (OECD) and national governments. In 2009 the OECD launched a workstream with the objective of advancing Entrepreneurship Education as one of the key drivers of sustained social development and economic recovery (OECD 2009a: 2009b). Encouraging enterprise is also perceived as key to creating jobs and improving competitiveness and economic growth throughout Europe (European Commission (EC) 2007; 2006; 2003; 2002). Small firms contribute to wealth creation, it is argued and can make an important contribution to creating new jobs; in providing employment options for people from under-represented and disadvantaged groups, and in creating a dynamic creative business environment, adaptable to change (Department for Business & Regulatory Reform (BERR) 2008, OECD 2001; EC 2003).

Enterprise education initiatives are not just promoted to foster more new businesses, but are also perceived to be an approach that will encourage individuals to be more enterprising in general, whether this is in their local communities or at work. (European Commission 2006; Gibb 2002). The argument for an 'enterprise culture' or an entrepreneurial society has thus become a ubiquitous discourse at both international and national policy levels. There is a danger, however, that this focus may be accompanied by complacency, an uncritical acceptance of enterprise policy initiatives, and the continued investment of public money. The role of academics and policy makers is to challenge such uncritical acceptance, by providing sound evidence based on rigorous empirical research studies. Currently the deployment of enterprise education lacks this evidence base, and is therefore often wielded blindly as a solution to a range of social and economic problems. Instead, a more sophisticated approach is needed, which takes into account the differing needs of individuals in diverse circumstances. Based on the conceptual and empirical evidence presented in this thesis I would like to propose a new model for mapping and understanding enterprise education, that could help improve the targeting and content of enterprise education to diverse cohorts.

In the introductory chapter it was shown how enterprise is deemed to be relevant to a wide range of policy issues across several government departments, thus reflecting different policy objectives (Kellard *et al.* 2002). The government

departments include: the Department for Business, Innovation and Skills (BIS); the Department for Communities and Local Government (DCLG); the Department for Work and Pensions (DWP); the Inland Revenue and Customs; the Social Exclusion Task Force; and the Equalities Office. In policy terms therefore, for the previous Labour government enterprise had many different functions in various contexts including: local regeneration in areas of deprivation; welfare to work solutions; local economic development, and finally as a route to employment for disadvantaged groups such as ethnic minorities and disabled people (ODPM 2004; Kellard *et al* 2002).

However, it was also shown how research evidence to substantiate the efficacy of these wide ranging aims is equivocal. For instance a study in the EU examined the contribution to job creation by small firms found that they type of business and characteristics of the owner are key contributing factors to the capability of a firm to create employment growth (Cowling 2003). In other words social capital and human capital influence the success of small firms, and their ability to grow and prosper. Other studies have provided further evidence of the influence of social and human capital (Mueller and Storey 2008). This actually makes an important link to another strand of enterprise policy, namely enterprise education.

A review of education policy in Chapter Two showed that the education and enterprise strategies of the previous Labour government have their roots in both a vocational instrumentalist approach to education, and a socio-egalitarian approach. The former approach was adopted by the Conservative government (1979 -1997), while the latter is more closely associated with traditional Labour values, e.g. the comprehensive schooling system (1965). Both sets of aims have traditionally been incorporated into education policy, but the emphasis of one set of values over another has differed according to prevailing ideology (Jones 2003). There is an inherent tension, however, in Labour's attempt to give equal weight to both sets of values, exemplified by the huge range of policy aims and objectives expected from their enterprise policies, as articulated by the many different government departments involved. Some of these confusions can be resolved by looking at the issues in a different and more systematic way. The findings of the longitudinal evaluation described in Chapter Seven, indicated the importance of recognising the

particular contexts in which enterprise education is experienced. The recognition and inclusion of these contexts can help to resolve some of the confusions in enterprise education policy.

The findings of the longitudinal evaluation showed that though enterprise potential was found to have increased in participants in a Young Enterprise Company Programme, there were also other, no less influential, factors correlated with levels of enterprise potential. These other factors, which include elements of human and social capital, it could be argued, may in fact be more influential than participation in an enterprise programme, because they are so much more deep-seated. In the discussion about young people's occupational choices the importance of cultural capital was highlighted. Cultural capital is a framework of language, cultural and social morés, and knowledge, which have value and currency within the educational system, and through which social norms are transmitted and social hierarchies reproduced (Bourdieu 1973). Cultural capital is passed on it is claimed, through the (linguistic) interactions of family, schooling, peer group, and location (Bourdieu and Passeron 1990). Access to cultural capital is influenced by wealth, or lack of wealth and cultural capital is an inter-generational commodity, which can accumulate in subsequent generations. This concept of cultural capital, I would argue, has some similarities with the concepts of social and human capital, as used in entrepreneurship research.

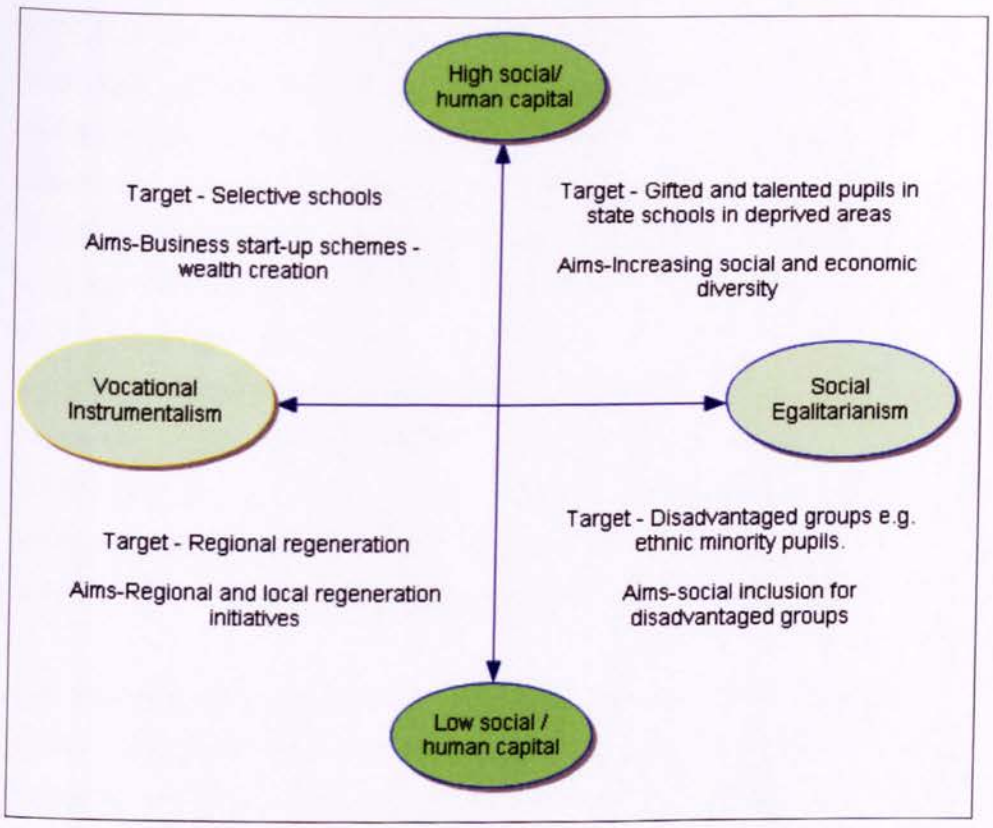
What the longitudinal evaluation found was that pupils who attended a selective school had significantly higher ATE test scores, interpreted as greater enterprise potential, than pupils at non-selective schools. Attending a selective school is indicative of greater social and human capital within the families concerned, because of the need for greater resources (financial, social and academic) to access such schools. Pupils with a parent in business also showed greater enterprise potential than those with none, again indicating the advantages of social capital (family business). Thus, it may be the case that to be most effective, enterprise policy and investment in enterprise education should be targeted at those with access to such social and human capital. Of course, the alternative could also be proposed and defended. But, these findings also indicate that too much weight should not be focused on enterprise policy, and that other factors need to be addressed as well.

By drawing on the theories of Bourdieu's cultural capital, which make explicit the often implicit connections between social class and educational attainment, the concepts of social and human capital, as used in entrepreneurship research, are presented in a new light. In this way, human and social capital are also explicitly linked, not to educational attainment, but to different types of enterprise education. What the model is intended to show is that individuals with different levels of both social and human capital would benefit from different types of enterprise education, each with a very different emphasis.

Given these findings I would like to propose a re-conceptualisation of enterprise education, which takes into account alternative educational values, and both economic and social contexts. Figure 8.3 is a model of enterprise education, which maps different types of programmes by target group, based on human and social capital. The model shows different educational values along the x axis, from vocational instrumentalism on the left to social egalitarianism on the right. Along the y axis are the levels of social and human capital, from a high level at the top to a low level at the bottom. Potential target groups for enterprise education programmes and particular initiatives are located in one of the four quadrants. Each quadrant represents different aims and objectives, and indicates different approaches needed for each type of initiative.

The top left quadrant contains enterprise education initiatives designed to improve economic development, for instance business start-up schemes. If the aim is economic development it is argued, then these initiatives should be targeted at individuals with high social and/or human capital. The approach will reflect vocational instrumentalism, that is, the emphasis is on the role these businesses will play in local economic development, rather than on developing the individual. Therefore these programmes should be targeted at primarily selective and high achieving schools. Pupils at these types of schools are the most likely to have the high social and human capital necessary for starting potentially high growth successful businesses. The content of such programmes would therefore include entrepreneurial topics, such as opportunity recognition, innovation, and networking, as well as small business management skills. Delivery mechanisms would include a range of experiential learning techniques, potentially quite fast-paced.

Figure 8.3 Model of Enterprise Education by Economic and Social Needs



By contrast the top right quadrant focuses on initiatives aimed at increasing social and economic diversity. These initiatives could be targeted at gifted and talented pupils in state schools in deprived areas. These pupils are likely to have either high social or human capital, but lack the skills to capitalise on their advantages because of where they live, and perhaps a lack of social networks that would be advantageous to enterprise. The aim of these initiatives is social egalitarianism. Here the focus is on the individuals, and giving them the skills to compete effectively. Of course there will be economic benefits as well, but the main emphasis is on social diversity and equality. The content of these programmes, and delivery mechanisms, therefore would be different to those aimed at selective schools. Developing personal skills and self-efficacy would be the aim, through the use of games, confidence building exercises, and enabling pupils to recognise and develop their strengths. Unlike for the previous group, here the pace would be slow and steady.

The bottom right quadrant contains initiatives which are aimed at social inclusion for disadvantaged groups, such as refugees, socially deprived, some ethnic minorities, and disabled pupils. This may well include self-employment schemes, but the emphasis and approach would be very different from those initiatives in the top left quadrant, which have economic goals. Instead these schemes would be targeted at individuals with typically low social and/or human capital. These social inclusion initiatives are focused on the individuals rather than on the types of businesses they may run in the future. The content of the programme would be very different as well, with greater emphasis on building self-efficacy than on actual business skills. Lack of both social and human capital would need to be addressed through these initiatives, which could provide a collection of different programmes. Individuals could then move through these different programmes, both horizontally and vertically, as they address personal needs and develop new skills. Personal needs may include numeracy and literacy, as well as social and/or health related issues.

The final quadrant is the bottom left, and I have labelled this economic regeneration. These enterprise education initiatives would be targeted at state schools and colleges in areas of deprivation, which are likely to contain pupils with low social and/or human capital. However, here the aims are economic and social regeneration and therefore initiatives would focus primarily on raising awareness of the value of enterprise. Introducing different types of enterprises would be a focus here, including social enterprises to meet a range of welfare needs in deprived areas. Achieving these aims would involve a focus on identifying change agents and individuals who can motivate communities to help develop community and social enterprises.

The aim of this model is to guide the development and targeting of the very many enterprise education initiatives that exist, and to provide a method for mapping them in terms of their aims and objectives. So, instead of the one size fits all approach adopted at present, different enterprise programmes need to be designed to meet very differing economic and social needs. Evaluations could help to determine these needs, underpin the design of programmes, and influence on-going improvement.

8.4 A Final Word

The contribution of the thesis to existing entrepreneurship theory has been to present a modified model for understanding enterprise potential in an educational context and also, importantly, to demonstrate how enterprise potential can be measured. This research has added a new dimension to this existing body of literature by demonstrating how an investigation of attitudes in young people can reveal information about their enterprise potential. Enterprise potential was conceptualised as high entrepreneurial self-efficacy which was interpreted and operationalised as positive attitudes towards five dimensions: leadership, achievement, personal control, creativity and intuition. The concept of self-efficacy was important in the redesign of the test in both a theoretical sense, and also methodologically.

In conclusion, the ATE test can provide a tool for evaluation studies of enterprise programmes enabling more rigorous research design using a pre- and post-test design, with control groups. It enables researchers to take into account other moderating factors, which may influence attitudes towards enterprise. For policy makers the test can provide evidence of the efficacy of different types of enterprise education programmes for different target groups, thus helping to identify how best to target resources and investment. The test can also highlight the potential impact of contextual and demographic factors such as type of school, ethnic background, and a family background of business ownership.

Overall, the test has proved to be a useful tool in evaluations studies, and the underlying conceptual development has made a contribution to our understanding of enterprise potential in young people. Finally, based on the conceptual and empirical work in this thesis, I have proposed a model to help guide future enterprise education policy.

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APPENDIX I

KINGSTON UNIVERSITY

School Questionnaire

Your effort in completing this questionnaire is greatly appreciated. AS THIS PAPER DOES NOT HAVE YOUR NAME ON IT, NONE OF THE ANSWERS CAN BE TRACED BACK TO YOU. So, we hope you can be both serious and honest.

- ***Some of the questions ask you to draw a circle round an option. You may be asked to tick a box. This may mean ticking just one box per question, or ticking one box in a line of options***
- **Please answer all the questions.**

1.

Name of your school	
Class number/name:	
Your date of birth (dd/mm/yy)	
Gender *(please circle)*	Female Male
Today's Date	

2. ***Please indicate your ethnic group by ticking one of the following boxes.***

Mixed (White and Black African)		Black or Black British – African	
Mixed (White and Black Caribbean)		Black or Black British – Other	
Mixed (any other mixed background)		Chinese	
Mixed White and Asian		White (British)	
Asian or Asian British – Indian		White (Irish)	
Asian or Asian British – Pakistani		White (other)	
Asian or Asian British - Bangladeshi		Any Other	
Asian or Asian British – Other		Not known	
Black or Black British Caribbean			

3. ***What type of work do your parents or guardians do?***

	Mother or Female Guardian (please tick one box)	***Father or Male Guardian (please tick one box)***
Full-time home-maker (does not do any paid work)		
In part-time employment		
In full-time employment		
Unemployed		
Self-employed or runs own business		
Don't know		

4. ***Please tell us what your Parents or Guardians do for a living? (Even if they are unemployed at the moment, please tell us what kind of work they normally do).***

	Please write in boxes:
Mother or Female Guardian	
Father or Male Guardian	

5. ***What is the highest type of qualification you expect to achieve?***

Type of Course	***Please tick one box***
Vocational course (e.g. nursery nurse, plumbing, arts foundation)	
GCSE	
GNVQ	
AS Level	
A Level	
University Degree	
Other type of course *Please tell us what type*	

6. How likely is it that you will do any of the following things when you leave school?
(Please circle one number in each line)

When I leave school, this is how likely I am to:	**Very Unlikely**						**Very likely**
Leave school and get a job straight away.	1	2	3	4	5	6	7
Join a work-based training scheme (e.g. YTS).	1	2	3	4	5	6	7
Stay on at school	1	2	3	4	5	6	7
Be unemployed.	1	2	3	4	5	6	7
Be a full-time homemaker	1	2	3	4	5	6	7
Go to University	1	2	3	4	5	6	7
Go to College	1	2	3	4	5	6	7
Other (please tell us what)	1	2	3	4	5	6	7

7. What are you likely to be doing in six years time? (Please circle one number in each line)

In six years time this is how likely I am to be:	**Very Unlikely**						**Very likely**
Working in a large organisation	1	2	3	4	5	6	7
Working in a small business	1	2	3	4	5	6	7
Have my own business	1	2	3	4	5	6	7
Working in a profession (lawyer, solicitor doctor, teacher etc.)	1	2	3	4	5	6	7
Be unemployed.	1	2	3	4	5	6	7
Other *please specify:*	1	2	3	4	5	6	7

8. ***Has anyone in your family ever owned a business?***

	Please tick all boxes that apply
Mother or female guardian	
Father or male guardian	
Grandmother	
Grandfather	
Aunt or Uncle	
Sister or Brother	
Cousin	
Other (please say who.....	

9. What is the highest educational qualification that your parents or guardians have?

Type of Course	***Mother or Female Guardian Please tick one box***	***Father or Male Guardian Please tick one box***
Vocational course (e.g. nursery nurse, plumbing, arts foundation)		
'O' Level		
'A' Level		
University Degree		
Higher Degree (e.g. Masters or PhD)		
Professional Qualifications (e.g. Lawyer, Doctor)		
Other type of course *Please tell us what type*		

Please indicate how much you agree or disagree with the following statements by circling one number in each line.

Strongly disagree = 1.....strongly agree = 7

10.1 **I believe a good imagination helps you do well at school.**

1 2 3 4 5 6 7
strongly disagree.....strongly agree

10.2 **I work hard to make my projects successful.**

1 2 3 4 5 6 7
strongly disagree.....strongly agree

10.3 **I think my future career success is largely up to me.**

1 2 3 4 5 6 7
strongly disagree.....strongly agree

10.4 **My friends would say I am a follower rather than a leader.**

1 2 3 4 5 6 7
strongly disagree.....strongly agree

10.5 **I like lessons that really stretch my imagination.**

1 2 3 4 5 6 7
strongly disagree.....strongly agree

10.6 **If you don't know all the facts about a problem then there is no way you can find the answer.**

1 2 3 4 5 6 7
strongly disagree.....strongly agree

10.7 **I'm good at motivating my classmates.**

1 2 3 4 5 6 7
strongly disagree.....strongly agree

10.8 **I have a lot of faith in my own ability to succeed in my future career.**

1 2 3 4 5 6 7
strongly disagree.....strongly agree

10.9 **It is important to finish off a project as well as you can.**

1 2 3 4 5 6 7
strongly disagree.....strongly agree

10.10 **I enjoy talking the class round to my point of view.**

1 2 3 4 5 6 7
strongly disagree.....strongly agree

10.11 **I trust my own instinct when solving problems in class.**

1 2 3 4 5 6 7
strongly disagree.....strongly agree

10.12 **I think I show a lot of imagination in my schoolwork.**

1 2 3 4 5 6 7
strongly disagree.....strongly agree

10.13 **It is important to plan my future career.**

1 2 3 4 5 6 7
strongly disagree.....strongly agree

10.14 **It doesn't matter if my project work is no good.**

1 2 3 4 5 6 7
strongly disagree.....strongly agree

10.15 **I think I can easily persuade my classmates, when I have a plan.**

1 2 3 4 5 6 7
strongly disagree.....strongly agree

10.16 **Making mistakes is a good way of finding out how to solve a problem.**

1 2 3 4 5 6 7
strongly disagree.....strongly agree

10.17 **I am proud of my project work this year.**

1 2 3 4 5 6 7
strongly disagree.....strongly agree

10.18 **I dislike Teachers who are always coming up with new ideas.**

1 2 3 4 5 6 7
strongly disagree.....strongly agree

10.19 **I take charge of other people at school.**

1 2 3 4 5 6 7
strongly disagree.....strongly agree

10.20 **I am worried that I will not make a success of my future working life.**

1 2 3 4 5 6 7
strongly disagree.....strongly agree

10.21 **I'll keep trying out different solutions to a problem rather than give up.**

1 2 3 4 5 6 7
strongly disagree.....strongly agree

10.22 **Working hard on projects is well worth the effort.**

1 2 3 4 5 6 7
strongly disagree.....strongly agree

10.23 **Other people will get the best jobs.**

1 2 3 4 5 6 7
strongly disagree.....strongly agree

10.24 **I don't enjoy lessons where it is up to pupils to come up with ideas.**

1 2 3 4 5 6 7
strongly disagree.....strongly agree

10.25 **If I don't know the answer to a problem, then I'll have a guess.**

1 2 3 4 5 6 7
strongly disagree.....strongly agree

10.26 **I don't like being the centre of attention in class.**

1 2 3 4 5 6 7
strongly disagree.....strongly agree

10.27 **It feels good when a school project works out well.**

1 2 3 4 5 6 7
strongly disagree.....strongly agree

10.28 **I have as much chance as anyone else of getting a good job in the future.**

1 2 3 4 5 6 7
strongly disagree.....strongly agree

10.29 **I enjoy lessons where the Teacher tries out different ways of teaching.**

1 2 3 4 5 6 7
strongly disagree.....strongly agree

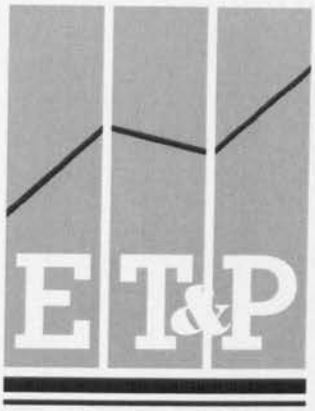
10.30 **Instinct helps me work out solutions to problems we are set.**

1 2 3 4 5 6 7
strongly disagree.....strongly agree

11. Have you ever taken part in a Young Enterprise Company Programme?	YES	NO

THIS QUESTIONNAIRE IS NOW COMPLETE! THANK YOU VERY MUCH FOR ALL YOUR ANSWERS!!

APPENDIX II Entrepreneurship Theory & Practice Published Paper



1042-2587

Measuring Enterprise Potential in Young People

Rosemary Athayde

As young people increasingly become the target of entrepreneurial and enterprise policy initiatives and enterprise education in schools increases, so does the need to effectively measure the impact these programs have. A research instrument was designed to measure "enterprise potential" in young people using attitudes toward characteristics associated with entrepreneurship. A control-group cross-sectional design was used to investigate the impact of participation in a Young Enterprise Company Program, which is based on the U.S. Junior Achievement model, in six secondary schools in London, United Kingdom. The study found that participation in a Company Program can foster positive attitudes toward self-employment and that participants displayed greater enterprise potential than nonparticipants. Demographic differences also emerged in enterprise potential between ethnic groups. Young Black people were more positive about self-employment and displayed greater enterprise potential than either White or Asian pupils. A family background of self-employment had a positive influence on pupils' intentions to become self-employed. Finally, the research raises a conceptual issue concerning the multidimensionality of the construct of "enterprise potential."

Industrialized countries around the world recognize the contribution made by small firms to a diverse and dynamic economic environment, to creating new employment opportunities, and to making a significant contribution to international trade (OECD, 1998). The Global Entrepreneurship Monitor classifies the United Kingdom overall as having a medium level of entrepreneurial activity[1] compared with other countries worldwide, though greater than other European countries such as France, Germany, and Italy (Harding & Bosma, 2006). Entrepreneurial activity is lowest among young people under 25, who also consider themselves most lacking in enterprise skills (Harding & Bosma). Entrepreneurship in young people under 25 therefore represents a relatively, as yet, untapped source of new business start-ups and economic growth. Governments are increasingly targeting enterprise policies at young people in order to unlock this potential resource (Hytti & O'Gorman, 2004).

A widespread increase in enterprise education has not been accompanied by independent research into the impact it has on young people and the benefits, if any, they may derive from taking part (Davies, 2002; Peterman & Kennedy, 2003). Part of the problem is the lack of clarity with which the many aims of enterprise policies are specified, and a lack of independent evaluations (Storey, 2003). This paper contributes to the debate over

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1. GEM measures total entrepreneurial activity including nascent enterprises.

the efficacy of enterprise education in schools by reporting on independent empirical research of an enterprise program in secondary schools in London. It also presents a specially designed research instrument to measure pupils' attitudes toward enterprise (ATE test).

The main focus of the study was the attempt to measure the effect of participation in a Young Enterprise (YE) Company Program on young people's attitudes toward starting a business and on their enterprise potential. YE in the United Kingdom is modeled on the U.S. Junior Achievement programs for young people. During Company Program 15–19-year-olds set up and run their own enterprise in school over the course of one academic year. The research comprises two studies, both of which are reported in this paper. Study 1 involves the development of a reliable and valid instrument (ATE test), and study 2 is the findings of empirical research in schools, using the refined instrument.

Conceptual Framework for the Research

A review of previous research designed to measure "enterprise" was carried out and a number of different models used to conceptualize "enterprise" were considered. Following an early review of the literature Caird (1991) developed the General Enterprise Tendency Test, a psychometric instrument designed to measure five key entrepreneurial traits: calculated risk taking; creative tendency; high need for achievement; high need for autonomy; and an internal locus of control (Caird). The use of such personality traits as a basis for developing a model of entrepreneurship, however, has suffered from conceptual and methodological problems. Personality traits are static and theories based solely on traits underestimate the influence of specific situational factors on actions (Ajzen & Fishbein, 1977). Moreover, such studies have demonstrated neither discriminant nor convergent validity (McCline, Bhat, & Baj, 2000; Robinson, Stimpson, Huefner, & Hunt, 1991). According to Gibb (1993, 2000), enterprise skills are not fixed personality traits but can be learned and developed through experience. In light of these limitations of personality trait theory, this research focused on attitude theory by building on the Entrepreneurial Attitude Orientation Scale (EAO) (Robinson et al., 1991) and subsequent work by McCline et al. (2000).

Attitude Theory

Robinson et al. (1991) based their design of the EAO instrument on a tripartite model of attitudes. Developments in social psychology have led to a definition of "attitude" as a predisposition toward a particular object (which includes abstract constructs) (Ajzen & Fishbein, 1977). The concept of "attitude" is more dynamic than that of "trait" as attitudes are responsive to external objects, and are capable of change. An "attitude" is also a much richer concept by being manifest in three ways: cognitive (beliefs), affective (emotions), and behavioral (actions) (Rust & Golombok, 1989).

As Robinson et al. (1991, p. 19) have noted "attitudes do not exist in isolation," and rather one has an attitude toward an object. The EAO scale was developed to measure attitudes toward four dimensions associated with entrepreneurship: achievement *in business*; self-esteem *in business*; personal control *of business outcomes*; and innovation *in business*. The ATE test was designed to measure young people's attitudes toward a similar collection of dimensions associated with entrepreneurship. The final selection of

dimensions, selected for this study, was slightly different from that used by Robinson et al. to take into account the need to design an instrument to measure enterprise "potential" in young people still at school rather than actual, adult entrepreneurs.

Defining "Latent" Enterprise Potential

The next step was to find a method to conceptualize "enterprise potential" in a way that would be appropriate for young people still at school, who were unlikely to have immediate "intentions" to become entrepreneurs. Here, the model developed by Krueger and Brazeal (1994) provided the starting point. Using Shapero's (1984) displacement model of the "entrepreneurial event," Krueger and Brazeal distinguished between the latent entrepreneurial "potential" of individuals from the "intention" to become entrepreneurial, which is a reaction to a displacement event (something which occurs to cause a change in behavior). Peterman and Kennedy (2003) used Shapero's model to measure school pupils' attitudes to business start-up. According to Peterman and Kennedy, attitudes to business start-up are influenced by: perceived desirability, perceived feasibility, and the propensity to act. Using a pre-test and post-test control group design, the researchers found that the entrepreneurial experience at school had a positive impact on pupils, who recorded significant changes in their perceptions toward starting a business after taking part.

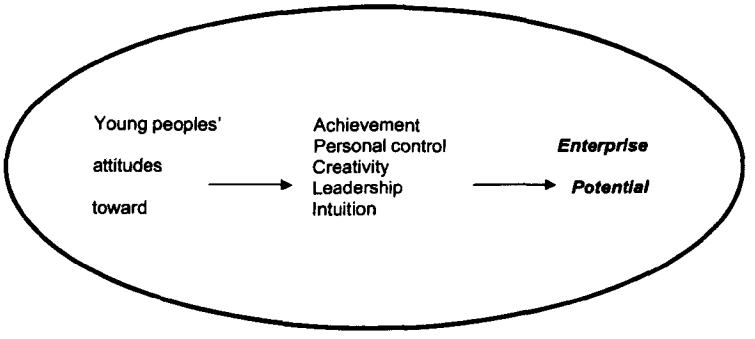
Dimensions of the Entrepreneur

Definitions of the successful entrepreneur often center on a collection of behaviors underpinned by certain skills and attributes, which include creativity; autonomy (personal control); achievement; leadership; and, less commonly, coping with uncertainty and ambiguity (Gibb, 1987, 1993, 2000, 2002). Attempts to measure the risk-taking propensity of entrepreneurs have had mixed results. Whereas studies such as Brockhaus (1976, 1980) and Peacock (1986) found no differences in risk taking between successful and unsuccessful entrepreneurs and the general population, Carland, Carland, Carland, and Pearce (1995) and Stewart, Watson, Carland, and Carland (1998) found that entrepreneurs had a greater propensity for risk taking than managers. These mixed findings and the difficulties of conceptualizing and operationalizing "risk taking" for young people at school, led to the decision to omit this dimension from the measure. "Self-esteem," included in the Robinson et al. (1991) study, was excluded because of its complexity, particularly in relation to children and the difficulty of operationalizing this dimension.

Dimensions were selected for inclusion in the measure based on certain criteria. According to these criteria a dimension should: consistently be associated with theories of entrepreneurship and have been measured in empirical studies to assess entrepreneurship. Based on these criteria five dimensions of latent enterprise potential were selected: achievement, personal control, creativity, leadership, and intuition. It needs to be made clear, however, that it is not the dimension itself that is to be measured (e.g., respondents' "achievement") but rather attitudes associated with enterprise such as "achievement" and the other dimensions. Latent enterprise potential was therefore operationalized as a constellation of attitudes toward certain characteristics associated with entrepreneurship (Figure 1). These characteristics, it is argued, combine to represent the essence of what it takes to become an entrepreneur given favorable situational factors, such as access to resources and market conditions.

Figure 1

Model of Enterprise Potential in Young People



Development of the Measure of Attitudes Toward Enterprise for Young People: ATE Test

The instrument design was based on procedures for the development of attitude tests, including Rust and Golombok's (1989) blueprint for defining constructs (dimensions), and Cronbach's (1990) "essentials" for testing. The design was also informed by paradigms for scale development used in the field of marketing (Churchill, 1979; Gerbing & Anderson, 1988). Like Ajzen and Fishbein (1977), Churchill emphasizes the importance of specifying the "domain" of a construct, and therefore previous research on entrepreneurship was taken as the starting point for developing test items.

The design of the items was based on the definition of the domain of each of the five dimensions selected for inclusion. For each entrepreneurial dimension items were designed to reflect one of three dimensions of an attitude: beliefs (cognitive), emotions (affective), and behaviors (behavioral). Eighteen items were created for each construct that reflected cognitive, affective, and behavioral manifestations, making a total of 90 items. There follows a description of the domain for each construct, with examples of test items.

Creativity

Timmons and Spinelli (2004) argue that creativity is central to the concept of entrepreneurship and is particularly relevant in the teaching of entrepreneurship. The concept in "entrepreneurship" has been measured in a number of studies (Caird, 1991; Gelderen, 2000; Louw, van Eeden, Bosch, & Venter, 2003; McCline et al., 2000; Robinson et al., 1991; Thomas & Mueller, 2000). According to Schumpeter's (1950) often cited dynamic model of "creative destruction," competition arises where some companies gain competitive advantage through innovation. Personal creativity, it is argued, is the precursor of innovative behavior and therefore "creativity" is a central dimension of "enterprising potential" in individuals. More recent definitions of entrepreneurship have also emphasized the central role of creativity in the innovatory process that leads to economic activity (Curran & Burrows, 1986; Morrison, 1998).

Test items were designed to measure pupils' attitudes toward the importance of creativity, how they felt about creativity, and whether they thought they themselves were creative.

Examples of test items for creativity in the ATE test:

I believe a good imagination helps you do well at school. (cognitive)
I enjoy lessons where the teacher tries out different ways of teaching. (affective)
I can often find better ways of doing things in class. (behavioral)

Personal Control

Previous research has found a significant relationship between the Protestant work ethic (PWE) and an internal locus of control (Furnham, 1990), where "locus of control" is the extent to which a person believes they have control over their life. Some studies in the field of entrepreneurship have been equivocal about the concept of "locus of control" given the limitations of "trait theory" (Robinson et al., 1991). The concept of "personal control" as an attitude, used by Robinson et al. and others, is therefore more appropriate as a central dimension in theories of entrepreneurship.

Personal control can be viewed as a prerequisite for action and Shapero (1984) and Krueger and Carsud (1993) propose that "propensity to act" is an essential disposition for new venture creation. Personal control has also been found to be a key factor in enterprise education programs. Bonnett and Furnham (1991) found that young people on an enterprise program had a greater degree of personal control than nonparticipants. Hansemark (1998) also discovered that participation in an enterprise program significantly increased the personal control of students compared with a control group.

Examples of test items for personal control in the ATE test:

I believe my successes at school are down to my own determination. (cognitive)
I prefer to figure things out on my own than rely on a teacher to explain. (affective)
I usually get on with things in class rather than wait for everyone else. (behavioral)

Achievement

The link between entrepreneurs and achievement motivation has been found by several studies (Caird, 1991; Durand & Shea, 1974; Morris & Fargher, 1974; Robinson et al., 1991). Achievement has been conceptualized and measured in many different ways. One study, for instance, looked at the "goal-setting," "perseverance," "drive," and "energy levels" of undergraduates (Louw et al., 2003). In developing a domain of enterprising behaviors of ordinary people, Gelderen (2000) included "being active," "busy," and "initiative."

Participants in an enterprise program for young people were found to have higher levels of achievement orientation than nonparticipants (Hansemark, 1998). Young people on a YE program were also found to hold stronger beliefs in "hard work" than nonparticipants (Bonnett & Furnham, 1991).

Examples of test items that measure achievement in the ATE test:

I have a lot more energy than most people at school. (cognitive)
I like to get work finished properly in class. (affective)
When we do a school project I'm always at the centre of things. (behavioral)

Intuition

The concept of "intuition" has been less commonly associated with entrepreneurship than others. "Intuition" is a dimension that can be associated with the ability to cope with uncertainty and unstable circumstances, which are often associated with enterprise creation (Gibb, 1987). Entrepreneurs can exploit opportunities others may miss because their cognitive abilities enable them to operate effectively even when faced with ambiguity and uncertain environments (Alvarez & Barney, 2002; Krueger & Brazeal, 1994).

Using the cognitive style index, Allison, Chell, and Hayes (2000) found that successful entrepreneurs were more intuitive in their cognitive style than managers. This underlines the importance of intuition in entrepreneurial activity and in particular intuitive approaches to information processing.

Examples of test items to measure intuition in the ATE test:

Making mistakes is a good way to learn. (cognitive)
I don't like making decisions unless I have all the facts. (affective)
I'll have a guess at a solution to a problem rather than give up. (behavioral)

Leadership

Vecchio (2003) identifies "leadership" as an important factor in entrepreneurship, but notes that it has received more attention so far within the general field of management. In a review of studies on entrepreneurial characteristics Vecchio (2003) argues that "entrepreneurship" can be viewed as a type of leadership, which occurs in a specific setting (i.e., a small business). This argument makes "leadership" a key dimension in the process of "entrepreneurship." According to Covin and Slevin (2002), effective entrepreneurial leaders encourage a culture where resources are managed strategically and opportunities are exploited.

Timmons and Spinelli (2004, p. 250) identify "leadership" as one of the six key themes needed for new venture creation, and list skills such as "team building," building "trust," and being a "self-starter." Gibb (1993) classes behaviors as enterprising, which seek to "persuade others" using skills and attributes such as "persuasiveness," "negotiation," "planning," and "decision taking." Grouped together these skills and attributes characterize part of what "leadership" embodies.

Examples of test items for leadership in the ATE test:

I believe I can easily carry my friends with me when I have an idea. (cognitive)
I enjoy talking the class round to my point of view. (affective)
I'm good at motivating my classmates. (behavioral)

The Research Questions

The research questions focus on the impact of participation in a YE Company Program on young people's attitudes to starting a business and on their enterprise "potential." Gibb (1993, 2000) argues that enterprise skills are not fixed personality traits, but can be learned and developed through experience, which is a tacit premise of all experiential learning-based enterprise programs. Support for this argument is found in Littunen's (2000) study. Littunen highlighted the contingent nature of entrepreneurial characteristics, such as "personal control," which he found are developed through the entrepreneurial process. Based on these findings therefore, the first two hypotheses to be tested were:

Hypothesis 1: Participants in a YE Company Program are more likely than nonparticipants to want to run their own business in future.

Hypothesis 2: Participants' ATE test scores will be higher than nonparticipants'.

The next set of hypotheses was concerned with differences in responses by demographic group. For example, national statistics show a gender difference in self-employment rates, with men more likely to be self-employed than women (Harding & Bosma, 2006). Previous research found that pupils at private schools were more positive about self-employment in the future than pupils attending state schools (Curran & Blackburn, 1990). There is also evidence that points to the positive influence of a family background of self-employment on young people's decisions to become self-employed (Curran & Blackburn; Davies, 2002). Finally, young Black people in the United States showed more desire for self-employment than other ethnic groups (Walstad & Kourilsky, 1998), and Black undergraduates have been found to display stronger entrepreneurial traits than White or Asian undergraduates (Louw et al., 2003). Based on these demographic differences, the following hypotheses were tested:

Hypothesis 3: Young men and women will differ in their desire for business ownership.

Hypothesis 4: Pupils at private schools and those at state schools will differ in their desire for business ownership.

Hypothesis 5: Pupils with a self-employed parent and those with none will differ in their desire for business ownership.

Hypothesis 6: There will be differences in the desire for business ownership between pupils from different ethnic backgrounds.

Hypothesis 7: ATE test scores will differ between young men and young women.

Hypothesis 8: ATE test scores will differ between pupils at private and state schools.

Hypothesis 9: ATE test scores will differ between pupils with a self-employed parent and pupils with none.

Hypothesis 10: ATE test scores will differ between pupils from different ethnic backgrounds.

Study 1: Testing the Reliability and Validity of the ATE Test

Evaluations of enterprise programs are necessary to provide evidence on their effectiveness to policy makers and to guide future enterprise policy direction. To be effective and provide accurate information, evaluations need to be rigorous and meet certain necessary conditions (Peterman & Kennedy, 2003; Storey, 1999, 2003; Westhead, Storey, & Martin, 2001). Independent academic evaluations are more likely to be rigorous and therefore recommended (Curran, 1996; Storey, 1999, 2003). Despite the widespread increase in enterprise programs internationally, there is an acknowledged lack of such evaluations that meet the necessary conditions. Most program evaluations are simple monitoring exercises carried out as feedback for providers and funding agencies.

Storey (1999) and Westhead et al. (2001) recommend that the design of training evaluations meet certain basic standards. They make four main recommendations. First, a

Table 1

Sample Profile (Study 1)

Characteristics	Number (%) (N = 196)	Number (%) (N = 196)
Company Program	Participants 89 (45.4)	Nonparticipants 107 (54.6)
Gender	Male 98 (50)	Female 98 (50)
Type of school	Independent 94 (48)	State 102 (52)
Highest qualification expected	Degree 167 (85.2)	Other 27 (13.9)†

† 2 not answered.

representative sample of participants should be used; second, matched control groups need to be incorporated; third, pre and post (program participation) testing should be carried out; and finally, objective as well as subjective outcomes should be measured.

In this study, the first two standards were met. The research design incorporated a representative sample and matched control groups, but the other conditions relating to longitudinal design were not adhered to. This was due to difficulties over gaining access to the subjects over the year-long period of the YE program.[2]

Method

Sample and Procedures. The ATE test was designed to measure the entrepreneurial "potential" of young people, and study 1 involved procedures to establish the underlying structures of the constructs and reliability of the test, and then its validity.

The ATE test was administered, as a paper-and-pencil test, to 196 young people aged 16–19 who took part in two Young Enterprise Entrepreneurship Masterclasses in central London. Almost half the sample had participated in a YE Company Program (Table 1). The sample was fairly evenly divided into pupils attending independent and state schools, and exactly half the sample was female and half was male.

A short 6-item PWE measure (Warr, Cook, & Wall, 1979) was used to test for validity of the ATE test.

Reliability Testing. Two tests of reliability were used: exploratory factor analysis (EFA) and Cronbach's alphas. According to Hair, Anderson, Taltham, and Black (1998), EFA is designed to extract latent factors or a set of common underlying dimensions of the overall construct. Items in the same common underlying dimension will show high correlation with each other, but low correlation with other items loading on different dimensions. An EFA was performed to discover whether items in each construct loaded only on that construct.

2. Based on the goodwill developed through this study, however, future testing of the ATE test will use pre and post testing and, where possible, some objective measures.

Table 2

Exploratory Factor Analysis (Varimax) for the Attitude Toward Enterprise Test (N = 196)

Items	Leadership scale	Creativity scale	Achievement scale	Personal control scale
1. I enjoy talking the class round to my point of view.	.715	—	—	—
2. I usually take the initiative on any project I'm involved in.	.708	—	—	—
3. I think I can easily carry my classmates with me when I have an idea.	.680	—	—	—
4. I enjoy talking responsibility for things in the classroom.	.662	—	—	—
5. I like taking the lead in projects at school.	.646	—	—	—
6. When we do a school project I'm right there at the centre of things.	.567	—	—	—
7. I believe that a good imagination helps you do well at school.	—	.827	—	—
8. I enjoy lessons where the teacher tries out different ways of teaching.	—	.717	—	—
9. Being creative is an advantage in lessons.	—	.716	—	—
10. I like lessons that really stretch my imagination.	—	.703	—	—
11. I have a lot more energy than most people at school.	—	—	.723	—
12. I like to get things off the ground when we're doing a project.	—	—	.720	—
13. I'm usually the "driving force" among my friends.	—	—	.608	—
14. I like to have a role at the margins of a project.†	—	—	.593	—
15. I like to get on with things in class rather than be taken through step-by-step by the teacher.	—	—	—	.800
16. I usually get on with things in class rather than wait for everyone else.	—	—	—	.682
17. I don't like lessons where we are left on our own to get on with our work.†	—	—	—	.582
18. I prefer to figure things out on my own rather than rely on a teacher to explain everything.	—	—	—	.504

† Scores reversed for these items.

The Kaiser–Myer–Olkin value was acceptable at .823, as was the significance of the Bartlett test at .00. Each construct began the process with 18 items and many of these loaded onto more than one factor, indicating redundant items. After an iterative process of removing items and performing factor analyses a solution was found that identified four factors, whose items loaded only on that factor (Table 2). It was not possible to find a solution that included the "intuition" construct and therefore this construct was omitted from the measure.

Internal consistency is the extent to which each item correlates with the rest, and how well it correlates, with the total item pool in the subscale. Cronbach's (1990) coefficient alphas were calculated for the remaining items in each construct.

There is some debate about what constitutes an acceptable alpha score. A summary of over 800 articles of empirical studies using Cronbach's alphas found that reported coefficients ranged from .6 to .99 (Peterson, 1994). Malhotra (1993) and Tull and Hawkins (1993) recommend .6. whereas Churchill (1979), on the other hand, recommends .7. In

Table 3

Cronbach's Alpha Scores for Main Constructs (N = 196)

Construct	Number of items	Cronbach's coefficient alpha
Self-perceptions of ability to lead others	6	.8097
Perceptions of creativity	4	.7528
Achievement orientation	4	.7501
Perceived personal control	4	.7250
Protestant work ethic	6	.7004
ATE test (overall alpha)	17	.8292

ATE, attitude toward enterprise.

this study, .7 was used as the benchmark and all four constructs passed this threshold (Table 3).

Validity Testing. To test the validity of the measure, a similar already published measure, based on the PWE scale, was used. The similarities between the achievement ethic of entrepreneurs and the PWE led to the choice of the latter to test the validity of the ATE test (Bonnett & Furnham, 1991; Furnham, 1990). A short 6-item test designed to measure "work ethic," and with language easily understood by 16–19 year olds, was selected (Warr et al., 1979). An EFA showed that the PWE test was unidimensional (Table 4), and the Cronbach's alpha score showed that it was internally reliable (Table 3).

According to Churchill (1979) and subsequent researchers (e.g., Hair et al., 1998, p. 118), a scientific method for establishing the validity of a new measure is the extent to which it correlates with other similar measures (convergent validity) and the extent to which it can be discriminated from other measures (discriminant validity). Discriminant validity proves that the measure is indeed testing different (new) constructs.

To establish discriminant validity the measure of average variance extracted (AVE) (Fornell & Larcker, 1981) was used. A correlation matrix was calculated for the four ATE constructs: personal control, achievement, leadership, and creativity; and the PWE scale (Table 5). For discriminant validity to be established a construct's AVE should be greater than .50 and the square root of the AVE higher than the corresponding bivariate correlation. Both these criteria were met by this exercise.

"Achievement," "leadership," and "personal control" were all positively correlated with the PWE scale. "Creativity," however, was negatively correlated with the PWE scale, indicating that this construct is not related to PWE. Moreover, "achievement," "leadership," and "personal control" were all correlated with each other; however, correlations with "creativity" for each construct was low. This may highlight limitations of the meta-construct of entrepreneurial "potential," which the overall ATE test was designed to measure.

Having established that the ATE test was reliable and valid, the remaining hypotheses were tested using the refined measure comprising 18 items. Hypotheses 7–10 were

Table 4

Exploratory Factor Analysis of the Protestant Work Ethic Scale (N = 196)

Items	Factor loadings
19. Even if I won a great deal of money on the lottery I would continue to work.	.677
20. If unemployment benefit was really high I would still prefer to work.	.659
21. I would hate to live off benefits.	.658
22. Having a job is very important to me.	.610
23. The most important things that happen to me involve work.	.533
24. I would soon get very bored if I had no work to do.	.521

Source: Protestant work ethic (Warr et al., 1979).

Table 5

Correlation Matrix Showing Discriminant Validity of Subscales (N = 196)

Subscale	CONTROL	ACH	LEAD	CREATE	PWE
Perceived personal control (CONTROL)	.714†				
Achievement orientation (ACH)	.4094	.751†			
Self-perceptions of ability to lead others (LEAD)	.4313	.5524	.758†		
Perceptions of creativity (CREATE)	.1375	.2814	.2110	.849†	
Protestant work ethic (PWE)	.3251	.4838	.4001	−.0029	.515†

† $\sqrt{}$ of the average variance extracted.

designed to investigate the impact of a range of demographic factors on enterprise potential as measured by the ATE test.

Study 2: The Influence of Demographic Characteristics on Enterprise Potential

Method

Sample and Procedures. The sample was drawn from 3 state schools, 1 of which was a single sex girls' school, and 3 private schools, 1 of which was a single sex boys' school (Table 6). There were 122 male and 127 female respondents ranging in age from 15 to 20 with a median age of 17. A total of 109 pupils had participated in the YE Company

Table 6

Sample Profile Study 2

Characteristics	Total	Company Program participant	Nonparticipant (control group)
Type of school			
Private	122	60 (55.5%)	62 (44.3%)
State	127	49 (45.0%)	78 (55.7%)
Total	249	109 (100%)	140 (100%)
Gender			
Boys	122	52 (47.7%)	70 (50.0%)
Girls	127	57 (52.3%)	70 (50.0%)
Total	249	109 (100%)	140 (100%)
Ethnic background			
Asian†	64	29 (26.6%)	35 (25.0%)
Black	85	33 (30.3%)	52 (37.1%)
White	100	47 (43.1%)	53 (37.8%)
Total	249	109 (100%)	140 (100%)
Self-employed parent			
Yes	100	47 (43.1%)	53 (37.9%)
No	149	61 (56.9%)	87 (62.1%)
Total	249	109 (100%)	140 (100%)

† The Asian category in particular is a very broad one encompassing a range of British Asians along with respondents from India, Pakistan, and Bangladesh, and therefore caution needs to be used when interpreting these findings.

Program and there was a matched control group of 140 pupils who had not participated. The control group was drawn from the same schools as participants, and was matched in terms of type of school attended, gender, age, and parents' self-employment status.

Employment Choices and the Desire for Self-Employment. The first hypothesis concerns the impact of participation in a YE Company Program on young people's desire for future self-employment. Respondents were asked to indicate on a scale of 1–4 how likely it was that they would be employed in one of five options in 6 years time. The five options were:

1. Work for a large organization.
2. Work for a small business.
3. Be self-employed/run own business.
4. Professional occupation.
5. Unemployed.

Hypotheses 3, 4, 5, and 6 were designed to investigate the impact on the desire for self-employment of four demographic characteristics: gender, type of school, having a self-employed parent, and ethnic background. In order to test the relative strength/weakness of each independent variable on the dependent variable—choice of future employment—a multiple analysis of variance was calculated.

Only two of the independent variables, participation in Company Program and having a self-employed parent, were significant at the .05 level overall in the choice of future employment options (Table 7). Looking at each employment option individually

Table 7

Significance of Demographic Variables on Anticipated Career in 6 Years Time: Tests of Between Subjects Effects (Multiple Analysis of Variance)

	Company Program	Gender	Self-employed parent	Type of school	Ethnic background		
Dependent Variables	Overall $p = .029$**	Overall $p = .192$	Overall $p = .011$**	Overall $p = .075$*	Overall $p = .058$*	Levene's test	Eta squared
	Sig.	Sig.	Sig.	Sig.	Sig.	Sig.	Sig.
Work for a large organization	.197	.059*	.127	.821	.030**	.129	.197
Work for a small business	.042**	.076*	.036**	.303	.699	.225	.201
Be self-employed	.040**	.058*	.025**	.761	.049**	.320	.193
Professional	.075*	.493	.054*	.075*	.048**	.193	.223
Unemployed	.733	.459	.235	.326	.072*	.341	.317

* significant at .10 level; ** significant at .05 level.

participants in a Company Program were more inclined to aspire to future self-employment than nonparticipants ($p = .040$). Interestingly, they were also *less* likely to want to work for a small business.

Pupils with a self-employed parent were significantly more likely to opt for self-employment than pupils with no self-employed parents ($p = .043$). They were also more likely to consider working in a small business ($p = .036$).

Ethnic background and type of school attended were approaching statistical significance ($p < .10$). Black pupils were more likely to consider self-employment in the future than either Asian or White pupils ($p = .051$), though they were also more likely to envisage unemployment as a possibility than either of the other two groups ($p = .072$), suggesting that self-employment may be a "negative" choice for some of these pupils, motivated by "push" rather than "pull" factors.

Asian pupils were more likely to see themselves working for a large organization than White or Black pupils, and White pupils were more likely than Asian or Black pupils to envisage working in a small business. On the other hand, Asian pupils were more likely to aspire to a professional occupation than either White or Black pupils.

Type of school attended was also approaching statistical significance ($p < .10$). Pupils at private independent schools were more likely to opt for a professional occupation than pupils at state schools.

Gender was not significant overall, though for each of the three options of being self-employed ($p = .058$), working for a small firm ($p = .042$), or being employed in a professional occupation ($p = .075$), boys were more likely to make a positive choice than were girls.

The Enterprise Potential of Young People. These hypotheses concern the entrepreneurial "potential" of young people taking into account participation in the Company Program

Table 8

Analysis of Variance Results for Attitude Toward Enterprise (ATE) Test Scores (N-249)

	Dependent variable				
	Ethnic background	Type of school	Company Program	Gender	Self-employed parent
	Significance	Significance	Significance	Significance	Significance
	.000**	.001**	.002**	.075*	.228
Mean ATE test scores	Black 72.0	Private 69.2	Participant 69.0	Male 66.8	Yes 68.1
	Asian 65.4	State 65.3	Nonparticipant 65.5	Female 64.1	No 66.7
	White 64.4				

* significant at .10 level; ** significant at .05 level.
ATE, attitude toward enterprise.

and four demographic variables: ethnic background, type of school, gender, and having a self-employed parent. An analysis of variance was calculated using these five factors as the independent variables, and ATE test scores as the dependent variable (Table 8).

All the independent variables apart from having a self-employed parent were significant for ATE test scores (Table 8). Participants in the Company Program scored significantly higher on the ATE test than nonparticipants. Black pupils scored significantly higher than either Asian or White pupils. Pupils attending private schools scored higher than pupils attending state schools. Finally, boys scored higher than girls (approaching statistical significance $p < .10$). Given these differences in scores between demographic subgroups, it was decided to investigate the impact of participation in the Company Program at group level using bivariate analysis. As having a self-employed parent was not significant, this category was omitted.

Impact of Company Program on Demographic Subgroups. Demographic subgroups were categorized by gender, ethnic background, and type of school attended. *T*-tests were calculated to estimate whether any differences in scores between participants and nonparticipants in the Company Program were significant.

Participants in all subgroups scored higher on the ATE test than nonparticipants (Table 9). Black girls and Asian boys, who participated, scored significantly higher than their counterparts in the control group who did not participate. Participant boys at private schools and at state schools, and participant girls at state schools also scored significantly higher than similar pupils who did not participate.

Discussion

Implications of the Research

A refined version of the ATE test was found to be reliable and valid, which lends some weight to the reported findings. Like previous studies (notably Peterman & Kennedy,

Table 9

Independent Samples Tests for Attitude Toward Enterprise (ATE) Test Scores by Participation

Demographic subgroups	Mean scores		Significance
	Participants	Nonparticipants	
All boys (n = 122)	68.0	65.8	.522
Black boys (n = 38)	71.4	69.7	.697
Asian boys (n = 29)	70.1	61.0	.000**
White boys (n = 55)	68.1	65.6	.561
All girls (n = 127)	66.7	61.9	.003**
Black girls (n = 46)	73.8	62.6	.056*
Asian girls (n = 33)	68.4	63.8	.310
White girls (n = 48)	63.0	60.8	.301
Private school boys (n = 66)	72.2	67.0	.039**
State school boys (n = 56)	67.2	63.2	.066*
Private school girls (n = 55)	65.2	63.2	.411
State school girls (n = 72)	68.0	60.9	.002**

* significant at .10; ** significant at .05.

2003) this research found that participation in an enterprise program positively influenced the desire for self-employment. Peterman and Kennedy investigated the impact of a Young Achievement Australia program similar to the YE Company Program, which is also derived from the U.S. Junior Achievement model.

Six of the proposed hypotheses of the study were statistically significant and four were not. From the range of demographic factors hypothesized to influence either a desire for self-employment or enterprise potential, "ethnicity," "having a self-employed parent," "type of school attended," and "participation in an enterprise program" proved to be significant.

The enterprise "potential" of young people, as measured by the ATE test, was increased by participation in the Company Program. Therefore, evidence is accumulating that this model of enterprise program in secondary schools can have a positive impact on fostering self-employment in young people. Further studies are needed to test the impact of other similar programs.

Desire for self-employment was also found to be related to demographic characteristics, such as ethnic background, gender, and having a self-employed parent. Pupils with Black ethnic backgrounds were more likely to envisage self-employment for themselves in the future than either of the other ethnic groups. A large-scale survey of attitudes to self-employment in the United States found that young Black people showed a high level of interest in business ownership, though this was not mirrored by an equally high rate of existing business ownership among the Black population (Walstad & Kourilsky, 1998). Louw et al. (2003) found that Black undergraduates scored consistently higher for entrepreneurial characteristics such as risk taking and taking initiative.

According to the Global Entrepreneurship Monitor (GEM) survey, entrepreneurial activity in the United Kingdom (including nascent enterprises) is highest among mixed

Black Caribbean/White, Black Caribbean, and Black African (Harding & Bosma, 2006). Many people who are considering starting a business (nascent entrepreneurs), however, do not actually do so (SBS, 2005). The actual rate of self-employment in the United Kingdom is highest among Asian groups and Asian British groups (14%) compared with Black or Black British groups (7%), while rates among White groups are 11% (Whitehead, Purdy, & Mascarenhas-Keyes, 2006).

The findings of this study suggest a similar gap between the aspirations of young Black people for self-employment and the reality of attaining this goal. This study found that young Black people were significantly more positive about future self-employment than either White or Asian pupils. Black pupils also scored significantly higher on the ATE test and therefore displayed greater enterprise potential than either White or Asian pupils. It is possible that as in the United States a lack of positive Black role models in business and a lack of business knowledge may hold back young Black people from becoming self-employed (Walstad & Kourilsky, 1998). If this is the case, then enterprise education in schools needs to be targeted at young Black people in particular, alongside more promotion of successful Black business owners, if they are to attain their employment aspirations.

Limitations of the Research

This study set out to investigate the impact of participation in a YE Company Program on young people's desire for self-employment and on their "enterprise potential" as measured by the ATE test. There are a number of limitations though, which indicates that more work is needed on the ATE test and the methodologies for its use.

As a cross-sectional design was used, this study needs to address the possibility of self-selection bias in the sample of participants and nonparticipants. The GEM study (Harding & Bosma, 2006) found that voluntary training increases the likelihood of someone thinking of starting a business considerably more than compulsory training. Therefore, though there may be some self-selection bias in the sample, this does not undermine the potential of participation in the Company Program to positively influence attitudes toward enterprise. In future studies, pre and post testing would eliminate the effect of self-selection by participants and better isolate, and so test, the impact of the Company Program.

The ATE test was designed to assess latent enterprise "potential" in pupils by measuring "attitudes" toward achievement, personal control, creativity, leadership, and intuition. These constructs, it was argued, combine to represent the essence of what it takes to become an entrepreneur, given favorable situational factors. However, procedures for identifying underlying structures, reliability, and validity tests exposed weaknesses in the concept of "enterprise potential" and in the measure.

"Creativity" was found to be correlated only weakly with the other constructs and was negatively correlated with the PWE scale. Nevertheless, a concept of creativity is historically intrinsic to theories of entrepreneurship. Therefore, either the items for this construct were badly designed or there is a conceptual problem with a meta-construct of "enterprise potential" which includes creativity. Reliability test scores for creativity were similar if not higher than some of the other constructs; therefore, the design is sound. We are left with the possibility that the meta-construct of "enterprise potential" is in fact a multidimensional construct comprised of five constructs that cannot be measured by one single-attitude test. "Achievement," "leadership," and "personal control" hang together as constructs, which describe a person who "strives" toward their goals. "Creativity" is clearly not in the same mold and therefore a unique attitude scale may be needed to

measure it. Further research, both conceptual and empirical, is needed to develop a more coherent multidimensional construct for "enterprise potential."

"Intuition" was omitted from the measure after EFA showed it was not a unidimensional factor, but had items that loaded on other factors. The importance of "intuition" to theories of entrepreneurship is gaining recognition and it would be worthwhile for future studies to continue to attempt to develop this construct. More work needs to be done, in particular, to specify the domain of "intuition," to enable the development of better test items. As with "creativity" it may prove to be the case that a separate scale is needed to measure "intuition."

This study has shown that it is possible to design a test based on attitude theory and using scale development techniques, to measure a concept defined as "enterprise potential" in school-aged young people. Such a test can be used in independent evaluations of enterprise education programs, which can take account of a range of other influences on young people's attitudes toward enterprise. The ATE test could be improved by refinements to some of the underlying constructs and to the test itself, by wider application during further research.

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