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Davies, Peter; Hughes, Amanda

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DEFINING AND ASSESSING ENTERPRISE CAPABILITY IN SCHOOLS

Peter Davies† and Amanda Hughes‡

† CHEEA, University of Birmingham, UK

‡ IEPR, Staffordshire University, UK

ABSTRACT

This paper describes the development of an instrument for assessing enterprise capability in schools. The approach to assessing enterprise capability builds on previous work by including three dimensions: self-efficacy, aspirations and knowledge and awareness. We find significant but weak associations between these three constructs suggesting that that, whilst they can be considered as providing a coherent description of enterprise capability they can also be regarded as distinct dimensions. The instrument also distinguishes between aspiration towards not-for-profit and for-profit enterprise and also between self-efficacy towards two broad enterprise capabilities: (i) project planning and (ii) working with people and information and two specific, market related capabilities: (iii) market risk and (iv) price and profit. We found only modest associations between students' sense of enterpriser self-efficacy and their enterprise knowledge and awareness.

INTRODUCTION

This paper describes the development of an instrument for assessing enterprise capability in schools. Since the idea of enterprise capability is contested, the first half of the paper concentrates on matters of definition. This introduction begins that task by addressing the breadth of the definition of 'enterprise' and whether schools should aim to develop students' enterprise capability.

Policy statements (e.g. Davies 2002, European Commission 2004) promoting enterprise education in schools predict it will foster an enterprise culture and economic growth. This optimism is shared across the globe with curricula (e.g. Department of Education of South Africa, 2001, p.27) and initiatives (e.g. Lewis and Massey 2003) appearing in diverse settings. From this perspective enterprise education empowers young people to seize opportunities to fashion their own economic trajectories.

Empowerment through enterprise has frequently, and rather narrowly, been associated with the development of entrepreneurs (e.g. Seikkula-Leino 2008). This has been particularly pronounced in higher education and in transition economies (e.g. Falkäng 2000, Mitra and Matlay 2004). However, whilst the formation and contribution of small businesses has been the

traditional policy concern, the role of social enterprises has been rising in prominence, notably in the light of initiatives such as the 'Big Society' idea promoted by the Coalition Government in England (Cabinet Office 2010). A number of commentators (e.g. Caird 1990, Kourilsky and Walstad 2007) prefer a definition of enterprise which includes the not-for-profit sector and 'social enterprises'. This broader definition is more in tune with recent trends in policy and is the one followed in this study.

Critics (e.g. Smyth 1999, Peters 2001) regard enterprise education as a programme to deflect public attention from structural causes of youth employment whilst securing young people's acquiescence to a neoliberal world view in which economic risks are transferred from corporations to individuals. This criticism applies with equal force to enterprise in for-profit or not-for-profit organisations. However, in a mixed economy, support for enterprise education does not presuppose support for a neoliberal agenda for economic reform (Deuchar 2006). If for-profit and not-for-profit enterprises are accepted as having a place within a mixed economy then it is legitimate to ask what kind of capability towards these enterprises is developed through education.

The establishment and success of small enterprises depends, at least in part, on the environment in which they are operating. A majority of individuals who start new businesses have substantial employment experience in the field in which the new business is operating (Cooper 1985, Bhide 2000). This suggests that specialised market knowledge and social networks may have a considerable role to play in enabling the establishment of a new business. In this light, Hvide (2000) explains new small business formation in terms of incapacity of large firms to gather sufficient information to always know when an employee has developed a new idea with strong market potential. So is there any scope for schools to affect individuals' enterprise capability?

Kourilsky and Walstad (2002) found that nearly 20% of entrepreneurs they surveyed believed that they had first started thinking about starting their own business before the age of 18. This does not necessarily mean that schooling had any impact on the development of these thoughts, but it does suggest that there is some potential for schooling effects to persist sufficiently into adult life to impact on subsequent behaviour in establishing enterprises. If schooling does have a significant effect then Europe may face a problem. A Gallup survey in 2009 suggested that whilst roughly half of EU citizens believed that their experience of schooling had developed their 'entrepreneurial skills and attitudes', this proportion was lower than that reported in the US and China. Using evidence from the Organisation for Economic Co-operation and Development (OECD) Programme for International Student Assessment (PISA) study, Falck and Woessman (2010) report large national differences in students' entrepreneurial aspirations and they attribute this in part to variations in the extent of private schooling[i].

The capacity of schools to make a difference to future capacity for enterprise depends in part on having a reliable way of assessing students' progress in this dimension of their attainment. A lack of assessment and a lack of a reliable and valid means of assessing enterprise capability has been identified as a major weakness in efforts to improve teaching and learning in England (e.g.HMI 2004, Draycott and Rae 2011).Whilst there have been some subsequent launches of courses leading to formal qualifications in enterprise for UK students (e.g. OCR 2010), the assessment used on these programmes is designed by each school and not publicly available.

This study aims to contribute to the development of an appropriate assessment for enterprise capability.

The next section discusses three strands that have been suggested as elements of enterprise capability and develops a rationale for the approach to assessing enterprise capability in this study. The three stands (aspiration, self-efficacy, understanding) have been chosen on the grounds they are closely related to the model of development put forward by Bandura, Barbaranelli et al. (2001) and more widely researched in enterprise education than alternatives (e.g. the attitude scale developed by Athayde 2009). Then we describe the sample and questionnaire instrument in the study and present some descriptive statistics. This is followed by a section which analyses the relationships between the strands of the research. The paper concludes with a discussion of the results, some implications for policy and practice, and some limitations of the study which bear upon the interpretation of the results.

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AREAS OF ENTERPRISE CAPABILITY

ASPIRATION

The formation of aspirations has been associated with inter-generational transmission of norms and expectations through upbringing and genetic differences. General models of inter-generational transmission of aspiration such as that put forward Bandura, Barbaranelli et al. (2001, 196) focus on social class differences associated with differences in type of occupation. However, there is no simple association between self-employment and social class. In the UK, the proportion of self-employed people in professional or managerial occupations is similar to the proportion for employees. The only occupational group substantially 'over-represented' amongst the self-employed are those in 'skilled trades' (ONS 2012). So the focus in the transmission argument switches from socio-economic status to whether parents are self-employed (Aldrich, Renzulli and Langton 1998). An alternative account of aspirations focuses on individual rather than social differences. For example, McClelland (1961) and Lumpkin and Dess (1996) attribute variation in entrepreneurial aspiration to individual differences on the basis of 'trait theory'. One fairly consistent finding in the literature (e.g. Kourilsky and Walstad 2002) is that aspirations towards (including for-profit) enterprise are strongly associated with a desire for autonomy in work (e.g. 'to be my own boss') and weakly (sometimes negatively) associated with desire for high earnings. However, in relation to one central theme in this approach, Brockhaus (1980) found that entrepreneurs had no greater propensity towards risk-taking than the population at large.

Nevertheless, there is substantial and largely consistent evidence of *social* differences in aspirations towards enterprise. A survey of just over 1000 secondary school students (grades 9-12) in the US (Kourilsky and Walstad 2002) found that 65% wanted to start a business of their own, with the proportions being higher amongst males and minority ethnic groups. This gender difference is also found in other studies (e.g. Zhao et al. 2005). Kourilsky and Walstad (2002) also found that, compared to other students, females and African Americans were more likely to want to start a charitable organisation. The proportion of individuals judging that it is desirable to be self-employed also varies substantially between countries (European Commission 2007, Hytti 2008). Falck and Woessman (2010) argue that at least some of this difference is due to the organisation of schooling, since they find that entrepreneurial aspirations are significantly, positively, associated with the proportion of students attending private schools. Falck, Heblich, and Luedemann (2010) also found a positive association between individuals' entrepreneurial aspirations and the aspirations towards enterprise of their peers in school.

SELF-EFFICACY

Self-efficacy is defined (Bandura 1997, 3) as 'beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments'. Given strong associations between desire for autonomy and entrepreneurship (Lumpkin and Dess 1996), it is not surprising that the role of self-efficacy in enterprise capability has received considerable attention (e.g. Shapero and Sokol 1982, Krueger and Brazael 1994, Zhao et al. 2005, Cooper and Lucas 2006). However, some previous studies that have reported using measures of students' self-efficacy towards

enterprise/entrepreneurship (e.g. Peterman and Kennedy 2003, Cooper, Gordon and Lucas 2007) have deviated from the definition of self-efficacy put forward by Bandura (1997). Following Bandura's recommendations for constructing self-efficacy scales (Bandura 2001, 2006), self-efficacy items must ask for judgements of confidence that one 'can do' or is 'able to do' something, e.g. 'I feel I can start a business if I want to'. However, many previous studies have used items that have been broader in scope, e.g. 'Start a business if you want', or have used command terms that are more like knowledge statements/questions, e.g. 'Do you know enough to start a business?' Schmitt-Rodermund and Vondracek (2002) used 'self-efficacy' items such as 'I am a good leader'. These statements were more focused on particular kinds of activity, but the stem 'I am good at' investigates perceptions of 'self-concept' rather than 'self-efficacy' (see Pajares and Schunk 2002). Self-concept statements presume a judgement on what a person has done in the past rather than the confidence they can do something in the future. Schmitt-Rodermund and Vondracek also combined scores from 'self-efficacy' items with scores from items on 'entrepreneurial interest', which followed the form 'I would like to', in order to provide a scale of 'entrepreneurial orientation'. In summary, whilst references to self-efficacy are common in the literature on enterprise capability, the design of assessment instruments has often been somewhat out of alignment with the theory of self-efficacy.

UNDERSTANDING

Three problems to be addressed in devising items to test understanding of enterprise are: (i) What phenomena do young people need to understand in the context of enterprise education? (ii) What level of understanding should we expect? (iii) What constitutes a valid way of assessing that level of understanding? In answering the first question, Kourilsky and Walsatd suggest that young people should understand the determination of price. Students' understanding of price has been widely researched (e.g. Dahlgren 1984, Berti and Grivet 1990, Sevón and Weckström 1989, Pong, 1997, Thompson and Siegler 2000, Pang and Marton 2003, Marton and Pong 2005, Leiser and Halachmi 2006, Authors forthcoming). These studies show that price determination may be understood in several different ways: (i) as an expression of intrinsic value, (ii) as a function of either supply *or* demand and (iii) as a function of the interaction of supply and demand. The form of items used by Kourilsky and Walstad (p. 67) does not allow for distinction to be made between these alternatives. Moreover, even when an item is carefully designed to distinguish between levels of understanding identified in the research literature, there is a further problem to be addressed; it is a fine art to design a multiple choice question which does not signal the superiority of an option to a bright student. For example, it is hard to avoid an option referring to supply and demand appearing superior to an option which refers only to supply. It is problematic to infer that a student who opts for the supply and demand option when prompted will also see this distinction in the context of everyday life.

RELATIONSHIPS BETWEEN THESE CONSTRUCTS

Each of these strands (aspirations, self-efficacy and understanding) is incorporated in a general model of aspirations and career trajectories proposed by Bandura, Barbaranelli et al. (2001). In their model aspirations, self-efficacy and understanding are regarded as mutually reinforcing.

Initially, parental aspirations inform children's self-efficacy. But achievement and social endorsement change children's self-efficacy. These changes in self-efficacy prompt changes in aspirations. Whilst self-efficacy improves in response to socially endorsed achievement it can also motivate future effort which in turn can have a positive impact on achievement. Multon et al. (1991) show that this model outperforms rival explanations in predicting occupational orientations and choices. This conclusion is reinforced by subsequent evidence of associations reported by Bandura, Barbaranelli et al. (2001) and more specifically by the associations found between self-efficacy in entrepreneurial tasks and intentions to own a business (Chen, Greene and Crick 1998). Whilst these associations are sometimes (e.g. Bandura, Barbaranelli et al. 2001) presented in the form of a causal model, currently available empirical evidence makes it difficult to substantiate these claims. Aside from the limited use of methods which can be used to establish claims for causation (such as randomised controlled trials), the three constructs (aspirations, self-efficacy, and understanding) have not always been carefully distinguished in assessment instruments.

Nonetheless, it is also important to understand the ways in which stronger self-efficacy, higher aspiration and understanding are shaped. Can a virtuous circle between these three constructs be encouraged through formal education? Pessimistic answers to this question tend to draw either on beliefs in immutability of character traits or social transmission of disadvantage. Character traits that have been proposed as typical of individuals more likely to engage in enterprising activity are desire for autonomy, willingness to take risks and readiness to expend effort. For example, Schmitt-Rodermund and Vondracek (2002) present a model in which 'willingness to expend effort' is treated as an intrinsic character trait which is developed through unobserved experiences rather than (as in Bandura's approach) a *product* of self-efficacy. Despite this, their evidence (p.3 Table 72) is more consistent with Bandura's contention. The two most strongly correlated relationships were between their measure of general self-efficacy and 'achievement orientation' and between general self-efficacy and 'entrepreneurial orientation' which combines items on entrepreneurial intentions and skills.

In Bandura, Barbaranelli et al.'s (2001) model, aspirations, self-efficacy and understanding are embedded in social class differences which inform parents' aspirations and self-efficacy towards academic achievement. These parental factors frame the student's academic aspirations and self-efficacy which in turn affect the student's actual attainment and their self-efficacy in different knowledge domains. This subsequently informs their choice of occupation. That is, self-efficacy and occupational aspirations are nested within an inter-generational transfer of educational achievement and aspiration thereby predicting strong socioeconomic background effects on choice of occupation. However, Schmitt-Rodermund and Vondracek (2002) find no evidence of an association (as would be expected following Bandura, Barbaranelli et al.'s model) between parental education and their measure of 'entrepreneurial orientation'. Boyd and Vozikis (1994, p.69) offer something of a hybrid between the trait and family background models.

Experience of enterprise has been suggested (e.g. Peterman and Kennedy 2003) as a third, background, source of self-efficacy, aspiration and understanding in enterprise. Young people may gather some experience indirectly or directly through self-employed parents. Since the distribution of self-employment in the UK is quite different from the distribution of employment by social class (Office for National Statistics 2012), this effect must be distinguished from the

influence of family background suggested in Bandura's model. Zhao et al.'s (2005) model incorporates elements from each of these three distinct approaches (trait theory, social class transmission through parents and experience of enterprise).

These three explanations of underlying sources of enterprise capability suggest different approaches to educational interventions. First, if character traits are, to some extent, susceptible to education, then interventions may seek to promote appetite for autonomy and hard work and readiness to take risks. Second, aspirations and self-efficacy may be fostered by improving attainment, as indicated by students' choices of subject to study (Davies, P., Davies, N., et al. 2009). Third, aspirations and understanding may be fostered through schools providing experience of enterprise and helping students to learn from experience gained through and beyond school. Whilst there are numerous accounts of interventions in schools to increase enterprise capability, there is a rather limited set of data which provide insights into causation. For example, Peterman and Kennedy (2003) evaluate the effect of an intervention which provided students with experience of enterprise activity. They reported a positive effect on aspiration, but did not measure self-efficacy or understanding. Conversely, Cooper, Gordon and Lucas (2007) find that a Young Enterprise scheme (which is also an 'additional experience' intervention) did not raise aspirations even though it did increase self-efficacy towards enterprise. One of the problems for both of these well designed studies is that participation in the schemes was voluntary so that superior rates of change with an intervention group might be attributable to their greater initial interest. More generally there is a need to develop assessment instruments for enterprise capability which are sufficiently broad in scope whilst able to distinguish effectively between different dimensions of enterprise capability.

METHOD

This section first describes the development of the assessment instrument through trials with 431 students in three schools. The final instrument was then used to assess enterprise capability in eight further schools and we describe the sample in the second part of this section. We conclude this section with a description of our data analysis.

THE DEVELOPMENT OF THE ASSESSMENT INSTRUMENT

We developed a questionnaire to assess each of three dimensions of enterprise capability: aspiration, self-efficacy and understanding. This choice of method reflects two main considerations. First, our intention is to provide a method of assessment which can be readily and practicably implemented with fairly large numbers of students in schools. Achieving this intention serves the needs of schools which are under pressure in their use of curriculum time. It also serves the interests of researchers (whether within or outside of school communities) who are seeking generalisable evidence. Second, two out of the three dimensions of enterprise capability (aspirations and self-efficacy) are conventionally evidenced through Likert scales of the kind used in this instrument. The assessment of understanding is more problematic. Whilst understanding is often assessed through multiple choice items, we recognize its validity is contested. We have therefore used multiple choice items from a reliable test instrument which has been used throughout the world. We believe this is a useful starting point.

The assessment instrument was refined through three successive trials with 431 students in secondary schools in England. Each trial resulted in the deletion of some questions which proved to be unrelated to any other items in the assessment. Other questions were amended as problems in wording became apparent. Some new questions were also added at each stage. Evidence of aspirations was gathered through four items taken from Cooper, Gordon and Lucas (2007) with two further items added to gather data on aspirations towards not-for-profits. We also investigated the usefulness of the distinction (Armitage and Conner 2001) between expressions of the desirability of an outcome, an intention towards an outcome and a prediction that an outcome will be achieved.

A key issue to be addressed in devising an enterprise self-efficacy measure for school students is that it is likely that most of them will have limited engagement in the type of entrepreneurial activities addressed in entrepreneurial self-efficacy scales that are devised for use with adults. However, if enterprise capability is defined in terms of 'project management' (as in Caird 1990), then relevant items can be written which fall within students' experience. This is an important consideration since the theorisation of self-efficacy asserts that it is developed through successful and acknowledged performance (Bandura 1997).

In trialling the instrument we experimented with different styles of question to gather evidence of understanding. We developed questions in which students were presented with enterprise problems in for-profit and not-profit settings and asked to judge whether different pieces of information would be relevant to choosing a response to the problem. We also used four multiple choice questions taken from the US 'Test of Economic Literacy' (TEL). These questions do not presume knowledge of technical language and they have good assessment characteristics (Walstad and Rebeck 2001). The items (on price and risk) were chosen because of their focus on phenomena that are relevant to enterprise and the large body of research on students' conceptions of price. In our main study our 'judging information' questions did not cohere into a common scale. Therefore, we use the results from the TEL questions in reporting the study. Since we only use 4 items we rely on the extensive reliability tests conducted on the full TEL.

THE SAMPLE FOR THE MAIN STUDY

For the main study we collected data from 800 14-15 year old students attending seven schools in England. None of these schools took part in the trials through which the instrument was developed. Each school volunteered to participate, suggesting that these schools have a commitment to enterprise education and this should be taken into account when interpreting the results. The questionnaire instrument was administered by teachers following instructions provided. A range of background characteristics were gathered and descriptive statistics for these variables are presented in Table 1.

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Table 1 Descriptive Statistics

	School							Total
	1	2	3	4	5	6	7	Sample
n	82	30	152	120	175	165	76	800
% Female	63		66	46	53	100	46	68
% parent in professional or managerial job	42	48	36	48	44	41	30	42
% mother been to university	19	36	19	24	22	32	16	25
Average Expected Maths and English Grades	11.6	11.2	10.2	11.9	10.1	10.6	9.8	10.67
Standard Deviation Expected Maths and English Grades	3.9	2.7	3.9	1.7	4.3	4.2	3.7	3.8
% White	83	4	57	97	88	15	84	52
% Indian	2	52	18	0	1	9	0	15
% Black Caribbean	1	18	6	0	0	28	1	10
% with parent who has owned a business	32	43	34	38	38	45	28	38

We do not have data on gender for one of the participating schools (School 2). The high (68%) proportion of female students reflects the inclusion of one girls only school. We use students' expected examination grades for mathematics and English as a measure of general academic ability. Estimation of expected examination grades (GCSE) at age 16 is a routine practice in English schools and these expectations provide a reasonable guide to students' average academic performance. In reporting our results we use the data on parents' employment and education as indicators of students socio-economic status (SES). We found associations (Fisher's Exact Test $p<.001$) between parents' education and employment and between these variables and expected grades. We found no association between parents' employment or education and ethnicity.

DATA ANALYSIS

We used Maximum Likelihood exploratory factor analysis with oblique rotation (Fabrigar, Wegener et al. 1999, Costello and Osborne 2005) to investigate the structure of the data on aspirations and self-efficacy. The number of factors was determined by the 'eigenvalue above 1' rule subject to inspection of the face validity of the subcategories and average loadings of around 0.6. Individual item loadings of between 0 .45 and 0.6 were retained when suggested by face validity and when the average loading for items in a sub-scale rounded to at least 0.6 when these items were included. In all cases the Kaiser-Meyer-Olkin Measure was very high (towards 0 .9) and the Bartlett's Test of Sphericity was highly significant, which indicated that the data had satisfactory statistical attributes for factor analysis. Cronbach alphas are reported for the main and subscales. We used logistic regressions to investigate associations between aspirations, self-efficacy and understanding and characteristics of students and their families: gender, occupation of each parent, education of each parent, ethnicity, expected examination grades in mathematics and English and whether either parent had owned a business. We report associations at $p<.05$ unless otherwise stated.

The scales for aspirations, self-efficacy and understanding provided continuous measures. However, whilst these scales appeared, on visual inspection, to conform to a normal distribution, they did not pass a Shapiro-Wilks test for normality. Therefore, for the regression

analysis, each scale was converted into a binary variable, taking a dividing point as close as possible to the median. We did carry out linear regressions as an additional sensitivity check and the results were similar to those reported in the results section below.

RESULTS

In this section we first present results of the exploratory factor analysis on the aspiration and self-efficacy items. Since the items for enterprise understanding were taken from a standardized test we did not include any separate analysis of these items. The second part of the section investigates associations between the aspiration, self-efficacy and understanding scales, students' characteristics and schools.

STUDENTS' ASPIRATIONS TOWARDS ENTERPRISE

The inter-item correlations did not provide any support for the distinction (Armitage and Conner 2001) between the desirability of an outcome, an intention to achieve an outcome and a prediction of the likelihood of an outcome. The factor analysis (Table 2) did, however, suggest a division between items according to the object of aspiration: for-profits or not-for-profits. Given that a trait of 'readiness to take risks' has sometimes been associated with an aspiration to entrepreneurship it is noteworthy that the statement 'The idea of high risk /high pay-off projects appeals to me' loaded rather weakly on the 'for-profit' aspiration factor.

Table 2 Aspiration Factors

Statement		Statement Type[1]	Factor Loadings	
			Aspiration to start a (for-profit) business	**Aspiration to lead a not-for-profit activity**
A	I am very interested in starting my own business sometime in the future	Desire	.88	
B	If I see an opportunity to start my own business in the next few years I'll take it	Intention	.82	
C	The idea of high risk/high pay-off projects appeals to me	Desire	.47	
D	I often think about ideas and ways to start a business	Desire	.68	
E	I am very interested in organising a sponsored event getting people to raise money for a charity	Desire		-.52
F	I expect that I will often take the lead in setting up events and organising group activities.	Self-prediction		-.94

[1] Using the categorisation suggested by Armitage and Conner (2001).

SELF-EFFICACY BELIEFS IN RELATION TO ENTERPRISE

The results of the exploratory factor analysis of the self-efficacy items are presented in Table 3. The Cronbach alpha for the full set of 15 items was 0.76 suggesting acceptable coherence as a single scale. Analysis of these 15 items suggested three factors: *Price and need self-efficacy*, *People and risk self-efficacy* and *Project planning self-efficacy.* These factors were similar to those obtained with the trial data. However, the trial results had suggested separate factors for

'working with people' and 'risk'. The items in these subscales were not separated by the analysis for the main study.

Table 3 Enterprise self-efficacy items[1]

	Price and Need Self-efficacy	*People and risk Self-efficacy*	*Project Planning Self-efficacy*
Cronbach Alpha[2] for subscale	*.65*	*.77*	*.76*
1 Can help a team to come to a decision that everyone is happy		.567	
2 Can motivate other people to do something		.597	
3 Can make sure that a project you are involved with gets finished on time			-.660
4 Can judge whether a project is likely to make a profit[3]			
5 Will stay calm in difficult situations[3]			
6 Can identify what people who will benefit from the project really want	.729		
7 Can plan the order in which things need to be done			-.544
8 Can manage your own time			-.833
9 Can check whether a project is working well			-.489
10 Can judge what would be a good price to charge	.970		
11 Can check whether changes to a project are needed		.459	
12 Can see what information is needed to check whether doing something is a good idea[3]			
13 Could take risks in order to benefit the project		.607	
14 Can gain the confidence and trust of people who do not know you well		.599	
15 Can market a product		.710	

[1]Extraction Method: Maximum Likelihood. Rotation Method: Oblimin with Kaiser Normalization.
[2] Cronbach Alpha for all 15 items=.76
[3] Loadings for these items below .45

ASSOCIATIONS BETWEEN SCALES, STUDENT CHARACTERISTICS AND SCHOOLS

The results of the logistic regressions are presented in Table 4. Two factors each increase the likelihood of aspiring to run one's own business by about fifteen percentage points: coming from a non-white ethnic background and having at least one parent who has owned a business. A student from a high SES background and average school grades who is not from a white background who has at least one parent who has owned a business is twice as likely to aspire to run their own business as an otherwise similar student from a white background who does not have a parent who has owned a business. This is in line with research on business managers by Cromie, Callaghan and Jansen (1992). Aspiration to run a not-for-profit enterprise had a strong positive association with being female. White females with average grades and without a parent who had owned a business were twenty-three percentage points more likely than males from

the same ethnic background to aspire to run a not-for-profit organisation. There was also evidence of school effects. Students attending Schools 6 and 7 were much more likely than students attending other schools to aspire to run not-for profit organizations. White girls with average grades attending School 6 were eighteen percentage points more likely than similar students attending the base school to aspire to run a not-for-profit organisation. The difference for School 7 was fifteen percentage points. School 6 is an all-girl, largely non-white school, so there may be some peer effect here associated with the individual characteristics. However, School 7 is not distinctive in this way, so there may be a curriculum effect here which merits further investigation.

Table 4 Associations between scales, student characteristics and schools[1]

	Aspirations		Self-efficacy				TEL items
Independent Variable	For profit	Not-for-profit	Overall	Price/Need	People and risk	Project -	
Female	-0.02 (.94)[2]	0.95 (<.01)	-0.03 (.92)	0.04 (.91)	-0.27 (.37)	0.81 (.01)	0.11 (.72)
Graduate mother	-0.55 (.12)	-0.03 (.94)	0.42 (.26)	0.23 (.54)	0.41 (.25)	0.54 (.12)	0.82 (.04)
Mother or father professional or managerial job	0.26 (.41)	0.01 (.97)	-0.05 (.88)	-0.02 (.97)	-0.03 (.93)	-0.10 (.75)	0.58 (.08)
Ethnicity: White	-0.67 (.01)	0.37 (.12)	-0.22 (.36)	-0.19 (.44)	0.23 (.34)	-0.43 (.07)	0.57 (.02)
Maths and English expected grades	0.02 (.35)	0.03 (.25)	0.08 (<.01)	0.09 (<.01)	0.05 (.04)	0.08 (<.01)	0.07 (<.01)
Either parent has run their own business	0.72 (.02)	0.26 (.43)	0.94 (.01)	0.49 (.16)	0.17 (.60)	0.80 (.01)	-0.30 (.36)
Gender* parents' job	-0.22 (.56)	-0.09 (.81)	0.36 (.36)	0.32 (.44)	0.36 (.35)	0.21 (.59)	-0.43 (.28)
Gender * graduate mother	0.69 (.12)	-0.13 (.77)	-0.52 (.26)	-0.07 (.89)	-0.23 (.61)	-0.90 (.04)	-0.12 (.80)
Gender * parent owned business	-0.23 (.56)	0.02 (.95)	-0.43 (.29)	-0.33 (.43)	0.45 (.25)	-0.54 (.16)	0.28 (.49)
School 1	-0.49 (.10)	0.45 (.12)	-0.28 (.36)	0.40 (.24)	-0.18 (.55)	-0.11 (.71)	-0.44 (.14)
School 3	-0.64 (.03)	0.03 (.91)	-0.68 (.02)	-0.74 (.01)	-0.56 (.04)	-0.22 (.42)	-0.64 (.02)
School 4	0.43 (.31)	0.00 (1.0)	-0.06 (.90)	0.13 (.79)	0.17 (.71)	0.04 (.93)	0.09 (.86)
School 6	-0.52 (.09)	0.84 (.01)	0.11 (.73)	-0.01 (.99)	-0.02 (.95)	0.06 (.85)	0.24 (.46)
School 7	0.18 (.55)	0.66 (.03)	-0.46 (.15)	-0.15 (.63)	-0.62 (.04)	-0.12 (.69)	-0.55 (.07)
Constant	0.21 (.61)	-1.50 (<.01)	-0.82 (.07)	-0.12 (.79)	-0.35 (.41)	-1.31 (<.01)	-0.73 (.09)
n	571	580	549	585	571	584	611
loglikelihood	769.082	754.013	715.587	686.207	751.090	766.219	758.236
Probability of scoring 1	0.50	0.52	0.52	0.69	0.57	0.50	0.59

Each model passed a Hosmer-Lemeshow test of goodness of fit
Figures in parentheses are p values

Self-efficacy was higher for students with higher expected grades for maths and English, but the effect sizes here are modest (round about five percentage points difference when moving between the lower and upper quartiles for expected grades). Female students had a higher self-efficacy than males towards project management. White females from a high SES background with average expected grades were five percentage points more likely than males to have self-efficacy towards project management which was above the median value for the scale. Students with at least one parent who has owned a business had a higher self-efficacy overall than other students, with this effect being driven by self-efficacy towards project management. For example, white males with average grades from a lower SES were almost twice as likely (twenty percentage points) more likely to report self-efficacy above the median if they had a parent who had owned their own business. Students attending School 3 had lower self-efficacy than students attending other schools, except in relation to project management. White males from a lower SES background with average grades who attended School 3 were sixteen percentage points less likely than similar students attending the base school to report overall self-efficacy above the median.

Socio-economic background (defined as whether mother or father was in a professional or managerial job) was associated with performance on the understanding items (TEL). White females from a high SES and with average expected grades were thirty percentage points more likely to score above the median in the TEL items. Students from a white ethnic background were also more likely to score well on these items. White females with average grades from a high SES background were twelve percentage points more likely than similar students from a non-white ethnic background to score above the median on the TEL items. This contrasts with a negative association between white ethnic background and an aspiration to run a for-profit business. Students at Schools 3 (the school in which students tend to have lower self-efficacy towards enterprise) scored significantly less than other schools on the understanding items. White students from a high SES with average grades were fifteen percentage points less likely than students in the base school to score above the median on the TEL items. Students in School 7 also scored less well than other students, but here the result is only significant at the 10% level.

Descriptive relationships between the scales are shown by correlation coefficients in Table 5. The stronger correlations are between aspirations (both for-profit and not for-profit), self-efficacy towards people and risk and self-efficacy towards project management. Other correlations, whilst statistically significant are low in magnitude. The understanding items are only weakly related to the self-efficacy subscales.

Table 5 Correlations between aspirations, self-efficacy and knowledge

		1	2	3	4	5	6
1 Aspiration to start a business	Correlation	1	**.46**	**.098**	**.403**	**.216**	-.032
	P value		**<.001**	**.008**	**<.001**	**<.001**	.387
	N		744	742	729	738	751
2 Aspiration to lead a not-for-profit activity	Correlation		1	**.102**	**.416**	**.312**	.016
	P value			**.005**	**<.001**	**<.001**	.663
	N			744	732	742	754
3 Self-Efficacy towards price and need	Correlation			1	**.201**	**.215**	**.077**
	P value				**<.001**	**<.001**	**.035**
	N				735	747	759
4 Self-efficacy towards people and risk	Correlation				1	**.511**	**.076**
	P value					**<.001**	**.037**
	N					734	743
5 Self-efficacy towards project management	Correlation					**1**	**.142**
	P value						**<.001**
	N						757
6 Knowledge (TEL items on price and interest rates)	Correlation						1
	P value						
	N						

Note: Values in bold indicate significant correlations.

CONCLUSIONS

Given the amount of effort and money that has been spent on seeking to develop young people's capability for enterprise it is surprising that the assessment of enterprise capability is still so undeveloped. This study contributes to the development of appropriate ways of assessing students' progress in this field through evaluating an instrument addressing three dimensions: enterprise aspirations, enterprise self-efficacy, and enterprise understanding. Evaluating the effectiveness of schooling in developing enterprise capability requires judgements not only about impact on intentions towards enterprise (as in the PISA study) but also judgements about effects on students' capability in the sphere of enterprise.

The study uses a three dimensional approach to the definition of enterprise capability in schools: aspirations; self-efficacy; and understanding. Whilst each of these dimensions has been addressed in previous literature, previous studies have not simultaneously addressed all three.

Our results suggest not only that it is appropriate to distinguish between these three dimensions, but also that there are distinct subscales within each. These results give broad encouragement for the view that these constructs should be viewed as distinct but nevertheless related elements in enterprise capability. This has important implications for the design of enterprise education in schools. Taken at face value, the results suggest that it is perfectly possible for a school to improve one of these three elements of students' enterprise capability whilst doing little to influence the other two. We also provide some indicative evidence that schools matter since we have found some significant differences between schools after taking account of individual student characteristics. A major theme of this paper is that schools should be encouraged to use assessments which evaluate students' progress in relation to each of these elements.

However, much work remains to be done in developing appropriate tools for schools to use in assessing students' enterprise capability. There has been a tendency in some previous research to use terms like 'self-efficacy' rather loosely and this has not helped the development of a body of evidence and appropriate methods to use for assessment. This study has aimed to contribute to the development of assessment in schools by (i) devising and testing self-efficacy items for enterprise capability which are closely aligned to the espoused theory (e.g. Bandura 1997, Bandura et al. 2001); (ii) devising and testing a novel type of assessment item for students' enterprise understanding; (iii) identifying sub-scales in students enterprise self-efficacy; and (iv) investigating relationships between the three elements of enterprise capability discussed in this paper.

Whilst we have tested this instrument using a reasonably large number of students we recognize that more work is needed, particularly on the assessment of the understanding dimension. We also appreciate that assessment can narrow students' experience of the curriculum. However, assessment can also help teachers and students to be more purposeful in their efforts in learning and teaching and we believe there is a strong case for improving the way that enterprise capability and enterprise curricula are currently evaluated in schools.

REFERENCES

Aldrich, H., Renzulli, L. A., & Langton, N. (1998). Passing on privilege: Resources provided by self-employed parents to their self-employed children. *Research in Social Stratification and Mobility*, 16, 291–317.

Armitage, C.J. and Conner, M. (2001). Efficacy of the theory of planned Behaviour: A meta-analytic review. *British Journal of Social Psychology*, *40*, 471–499.

Athayde, R. (2009). Measuring Enterprise Potential in Young People, Entrepreneurship *Theory and Practice*, 33, 2, pp. 481-500.

Authors (forthcoming)

Bandura, A. (1997). *Self-efficacy: The exercise of control.* New York: W. H. Freeman and Company.

Bandura, A. (2001). *Guide for constructing self-efficacy scales (Revised Ed.)*. Stanford, CA: Stanford University.

Bandura, A. (2006). Guide for constructing self-efficacy scales. In F. Pajares and T. Urdan (Eds.), *Self-efficacy beliefs of adolescents* (pp 307-337). Greenwich, CT: Information Age Publishing.

Bandura, A., Barbaranelli, C., Caprara, G.V. and Pastorelli, C. (2001). Self-efficacy beliefs as shapers of children's aspirations and career trajectories, *Child Development*, 72, 1, pp. 187-206.

Berti, A. E., & Grivet, A. (1990). The development of economic reasoning in children from 8 to 13 years old: Price mechanism. *Contributi di Psicologia,* 3, 37–47.

Bhide, A.V. (2000). *The Origin and Evolution of New Businesses*, Oxford: Oxford University Press.

Boyd, N. G., & Vozikis, G. S. (1994). The influence of self-efficacy on the development of entrepreneurial intentions and actions. *Entrepreneurship Theory and Practice, 18*(4), 63–77.

Brockhaus, R.H. Snr. (1980). Risk-taking propensity of entrepreneurs, *Academy of Management Journal*, 23, 3, pp. 509-520.

Burger, L., O'Neill, C. and Mahadea, D. (2005). The impact of previous knowledge and experience on the entrepreneurial attitudes of Grade 12 learners, *South African Journal of Education*, 25(2), 89-94.

Cabinet Office (2010). *Building the Big Society.* London. The Cabinet Office. Available online at http://www.cabinetoffice.gov.uk/media/407789/building-big-society.pdf

Caird, S. (1990). Enterprise Education: The need for differentiation*, Journal of Education and Work*, 4, 1, 47-57.

Chen, C. C., Greene, P. G., & Crick, A. (1998). Does entrepreneurial self-efficacy distinguish entrepreneurs from managers? *Journal of Business Venturing, 13,* 295–316.

Cooper, A.C. (1985). The role of incubator organizations in the founding of growth-oriented firms, *Journal of Business Venturing*, 1, pp. 75–86.

Cooper, S.Y. and Lucas, W.A. (2006). Enhancing self-efficacy for entrepreneurship and innovation: an educational approach. *International Journal of Entrepreneurship Education,* 4, pp. 141-162.

Cooper, S., Gordon, J. And Lucas, W. (2007). *Developing entrepreneurial self-efficacy and intent through youth enterprise programmes*, paper presented at the Small Enterprise Conference, 'Building Sustainable Growth in SMEs', 23-26 September 2007, Hamilton, New Zealand.

Costello, A.B. and Osborne, J.W. (2005). Best practices in exploratory factor analysis: four recommendations for getting the most from your analysis, *Practical Assessment, Research and Evaluation,* 10, 7, pp. 1-9.

Cromie, S., Callaghan, I. and Jansen, M. (1992). The entrepreneurial tendencies of managers: a research note. *British Journal of Management,* 3, 1, pp. 1–5.

Dahlgren, L. (1984). Outcomes of Learning, in (Eds) F. Marton, D. Hounsell and N. Entwistle *The Experience of Learning,* Edinburgh: Scottish Academic Press.

Davies, H. (2002). *Enterprise and the Economy in Education.* London: Her Majesty's Stationary Office.

Davies, P., Davies, N., Hutton, D., Adnett, N. and Coe, R. (2009). Choosing *in* schools: locating the benefits of specialisation, *Oxford Review of Education,* 35, 2, pp. 147-167.

Department of Education of South Africa (2001). Revised National Curriculum Statement Grades R-9 (Schools). Pretoria, Department for Education. Available online at http://www.info.gov.za/view/DownloadFileAction?id=70257.

Deuchar, R. (2006). 'Not only this, but also that!' Translating the social and political motivations underpinning enterprise and citizenship education into Scottish schools. *Cambridge Journal of Education*, 36, 4, pp. 533-547.

Draycott, M. and Rae, D. (2011). Enterprise education in schools and the role of competency frameworks, International, *Journal of Entrepreneurial Behaviour & Research,* 17(2) pp. 127 – 145.

European Commission (2004). *Action Plan: The European agenda for Entrepreneurship.* Brussels. Commission of the European Communities. Available online at ftp://ftp.cordis.europa.eu/pub/incubators/docs/action_plan_on_entrepreneurship.pdf

European Commission (2007). *Entrepreneurship Survey of the EU (25 Member states), United States, Iceland and Norway. Analytical Report April 2007*. Flash Barometer No. 192.

Fabrigar, L. R., Wegener, D. T., MacCallum, R. C., & Strahan, E. J. (1999). Evaluating the use of exploratory factor analysis in psychological research. *Psychological Methods*, *4*, 272-299.

Falck, O., Heblich, S. and Luedemann, E. (2012). Identity And Entrepreneurship: Do Peers at School Shape Entrepreneurial Intentions? *Small Business Economics, 39, 1, pp. 39-59.*

Falck, O. And Woessman, L. (2010). School Competition and Students' entrepreneurial intentions: International Evidence Using Historical Catholic Roots of Private Education, CESifo Working Paper No. 3086.

Falkäng, J. (2000). The Assessment of Entrepreneurship Education, *Industry and Higher Education*, 14(2), pp. 101-108.

The Gallup Organisation (2009). *Entrepreneurship in the EU and Beyond: A survey in the EU, EFTA countries, Croatia, Turkey, the US, Japan, South Korea and China, requested by (EU) Directorate-General for Enterprise and Industry, and coordinated by Directorate-General Communication* , Analytical Report. Flash EB Series #283. Available online at http://ec.europa.eu/enterprise/policies/sme/facts-figures-analysis/eurobarometer/fl283_en.pdf

Her Majesty's Inspectorate for Schools (HMI) (2004). *Learning to be enterprising: An evaluation of enterprise learning at Key Stage 4*. (London: OfSTED).

Hvide, H. (2009). The Quality of Entrepreneurs, *Economic Journal,* 119, 1010-1035.

Hytti, U. (2008). Enterprise Education in different cultural settings and at different school levels, in A. Fayolle and P. Kyro (Eds) *The Dynamics between Entrepreneurship, Environment and Education*. Cheltenham, Edward Elgar, pp. 131-148.

Jack, S.L. and Anderson, A.R. (1999). Entrepreneurship Education within enterprise culture: producing reflective practitioners, *International Journal of Entrepreneurial Behaviour and Research*, 5(3), 100-125.

Kourilsky, M. And Walstad, W.B. (2002). The early environment and schooling experiences of high-technology entrepreneurs: Insights for entrepreneurship education, *International Journal of Entrepreneurship Education,* 1, 1, 87-106.

Kourilsky, M. L. And Walstad, W.B. (2007). *The Entrepreneur in Youth.* Cheltenham, Edward Elgar.

Krueger, N and Brazeal, D (1994) Entrepreneurial Potential and Potential Entrepreneurs, *Entrepreneurship Theory and Practice*, Spring, 18, 3, 91-104.

Leiser, D. and Halachmi, R.B. (2006). Children's Understanding of Market Forces, *Journal of Economic Psychology*, 27, 6-19.

Lewis, K. and Massey, C. (2003). Delivering enterprise education in New Zealand, *Education + Training,* 45, 4, pp. 197-206.

Lumpkin, G.T. and Dess, G.G. (1996). Clarifying the Entrepreneurial Orientation Construct and Linking It to Performance, *Academy of Management Review,* 21, 1, pp.135-172.

Marton, F. and Pong, W.Y. (2005). On the unit of description in phenomenography. *Higher Education Research and Development*, 24, 335-348.

Mitra, J. & Matlay, H. (2004). Entrepreneurial and Vocational Education and Training: lessons from eastern and central Europe, *Industry and Higher Learning*, 18(1), pp. 53-61.

Multon, K. D., Brown, S. D., Lent, R. W. (1991). Relation of self-efficacy beliefs to academic outcomes: A meta-analytic investigation. *Journal of Counseling Psychology*, 38,1, 30-38.

Office for National Statistics (ONS) (2012). Labour Market Statistics Data Tables (Excel Spreadsheets), London, Office for National Statistics. *http://www.ons.gov.uk/ons/rel/lms/labour-market-statistics/may-2012/index-of-data-tables.html. Accessed 17th January 2013.*OCR (2007) *Business Enterprise Level 2 Award Centre Handbook*. (Coventry, OC). Available online http://www.ocr.org.uk/download/kd/ocr_10657_kd_vrq_centre.pdf.

Pajares, F. and Schunk, D. H. (2002). Self and self-belief in psychology and education: An historical perspective. In J. Aronson & D. Cordova (Eds.), *Psychology of education: Personal and interpersonal forces*. New York: Academic Press.

Pang, M. and Marton, F. (2003). Beyond 'Lesson Study': Comparing two ways of facilitating the grasp of some economic concepts. *Instructional Science,* **31**, 237-257.

Peterman, N.E. and Kennedy, J. (2003). Enterprise Education: influencing students' perceptions of entrepreneurship. *Entrepreneurship: Theory and Practice* 28, 1, pp. 129-144.

Pong, W. (1997). Students' Ideas of Price and Trade. *Economic Awareness*, 9, 6-9.

Seikkula-Leino, J. (2008). Advancing entrepreneurship education in Finnish basic education: the prospects for developing local curricula, in A. Fayolle and P. Kyro (Eds) *The Dynamics between Entrepreneurship, Environment and Education*. Cheltenham, Edward Elgar, pp. 169-190.

Sevón, G., and Weckström, S. (1989). The development of reasoning about economic events: A study of Finnish children. *Journal of Economic Psychology,* 10, 495-514.

Shapero, A. and Sokol, L. (1982). The social dimensions of entrepreneurship. In C.A. Kent, D.L. Sexton, & K.H. Vesper (eds.), *Encyclopaedia of Entrepreneurship*, 72–90. Englewood Cliffs, NJ: Prentice Hall.

Schmitt-Rodermund, E. and Vondracek, F.W. (2002). Occupational dreams, choices and aspirations: adolescents' entrepreneurial prospects and orientations, *Journal of Adolescence,* 25, 1, pp. 65-78.

Smyth, J. (1999). Schooling and enterprise culture: pause for a critical policy analysis, *Journal of Education Policy*, 14, 4, pp. 435-444.

Thompson, D. R., and Siegler, R. S. (2000). Buy low, sell high: The development of an informal theory of economics. *Child Development,* 71, 660–677.

Walstad, W.B. and Rebeck, K. (2001). Assessing the Economic Understanding of U.S. High School Students, *American Economic Review*, 91, 2, pp. 452-457.

Zhao, H., Seibert, S. and Hills. G.E. (2005). The Mediating Role of Self-Efficacy in the Development of Entrepreneurial Intentions. *Journal of Applied Psychology*, 90, 6, pp. 1265-1272.

Notes

[i] Their assertion is based on an observed association at national level. It is, therefore, highly speculative.