Ascertaining the impact of endogenous and exogenous factors on the performance of students taking non-specialist accounting courses

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Abstract

This study aims to evaluate the potential determinants of academic performance of non-specialist accounting students. Considering both actual and initially expected performance, in conjunction with students' learning styles and preferences, we use two econometric methods - Ordinal Probit and Ordinary Least Squared - in order to investigate and assess the impact of endogenous and the exogenous factors on the students' academic achievement. Eventually, based on the results of our estimations, and by dividing the non-specialist students into segments, according to their demographic characteristics, we run a series of simulations to estimate empirically the likelihood of the students to report an academic performance weaker, in line, better, and considerably better than what they expected.

Key words: Non-specialist accounting, students' performance, endogenous and exogenous factors

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1. INTRODUCTION

Addressing the issue of accounting education one finds themselves in front of a multitude of approaches, requirements, and dilemmas with regards to both its orientation and objectives. Relevant literature, addresses a wide spectrum of interests covering philosophical and ethical predicaments, the issue of academic versus professional orientation, requirements proposed by professional bodies and practice, curricula development, as well as assessment criteria and objectives (see Akers *et al*., 1997; Ingram and Howard, 1998; Apostolou *et al*., 2001; McPhail, 2003; Boyce, 2004,). The student performance has been an important topic for higher education institutions and recently due to the new developments (such as new university fees) the academic performance of students has been given even more importance and publicity. Discovering the possible determinants of academic success of students is crucial to all the stakeholders involved as will help the Universities to modify their teaching methods and allocate their resources more accordingly. Factors influencing the academic performance of the students received broad attention through a wide body of research in the accounting literature (Gracia and Jenkins, 2003; Byrne and Flood, 2008; Guney, 2009; Uyar and Gungormus, 2011).

However, the common presupposition of most of the relevant literature considers specialist students as the key audience of accounting education. In most cases the requirements of teaching accounting to non-specialist students are evaluated through research focusing on their performance whilst attending introductory or intermediate accounting modules, which are most often designed to cater for the needs of specialist students. Relevant research shows that non-specialist students tend to underperform in undergraduate accounting modules compared to other subjects (Doran *et al.,* 1991; Wooten, 1998; Lucas, 2000 and 2001; Guney 2009). Lucas and Meyer (2005) argue, however, that non-specialist students enter their studies with very different perceptions of accounting compared to accounting students and these perceptions are differentially linked with transformative, accumulative and pathological learning processes. Moreover, non-specialist cohorts are likely to have heterogeneous expectations fuelled by differences in students' educational backgrounds.

On the other hand increasing complexity of the business environment over the last few decades, requiring managers and individuals to be able to promptly respond to a multitude of environmental challenges, increased the influence of accounting as an information system. The importance of developing financial literacy amongst university students, for improving

both personal financial management and employability, is increasingly recognised by a number of universities offering non-specialist accounting courses as part of both their undergraduate and postgraduate programmes of study (Choi and Muller, 1992; DeLaune *et al*., 2010; Stretcher *et al*., 2010). This raises a series of questions in terms of the adequacy, relevance, and effectiveness of these courses in meeting the students' expectations and requirements, as well as poses a challenge for accounting lecturers to anticipate and cater for the requirements of an audience with diverse learning needs and expectations.

There is lack of research in the accounting education field that attempts to ascertain the definition of success among students and especially among accounting students. The evidence becomes even scarcer for the case of non-specialist student in accounting subjects. There is a strong call for exploring students' actual views towards their learning success in the Accounting Schools. Much of the existing empirical evidence focuses on the *endogenous* factors affect the students' academic performance in accounting and proposes how these factors (gender, ethnicity, prior knowledge in accounting, career paths) can explain the students' scores differential. Additional to such aspects, this study considers student *exogenous* factors such as teaching competencies, the curriculum design, the reading material used, the use of educational technology and the assessment practice. Among all exogenous characteristics lecturers are generally perceived to play a vital role in students' achievement by institute administration, parents and the students themselves. This paper makes an empirical attempt to address the above-mentioned issues by considering a mixture of *endogenous* and *exogenous* factors which are predicted to affect the performance of the non-specialist students which constitute a significant cohort in any university. A unique characteristic of our sample is that it contains information on parental occupation and education with a view to unearthing any *intergenerational* links. Hence, the present research aims to identify and provide more evidence points to the factors influencing academic performance of non-specialist students in accounting. Furthermore, the present study employs an econometric model to examine *multivariately* and *univariately* the effect of various student-exogenous and student-endogenous factors on their academic achievement. The model will be used to run some simulations and *forecasts*.

The paper is set up as follows: The next section outlines the literature and develops the hypotheses. Section three outlines the method and the model. The next two sections describe the construction of the sample, the data and illustrate certain descriptive statistics. The penultimate section discusses the results and forecasts. The final section concludes.

2. HYPOTHESIS DEVELOPMENT

The objective of the study is to uncover the potential determinants of performance of non-accounting degree students. Instead of recording the students' final marks we let the students rate their performance. Specifically, the response variable to measure performance is a 4-point question: *"Reflecting on your performance did you perform: (1) weaker than you expected, (3) about what you initially expected, (3) better than expected (4) significantly better than you expected"*.

Students' perceptions of learning success are said to vary (Yazedjian *et al*., 2008) and is also associated with their academic performance (Sheldon *et al.*, 2003; Vansteenkiste *et al.*, 2004). Therefore, by letting the students assess their own performance we implicitly reveal their own *unobserved intrinsic* goals of what is good academic performance (for example a grade around 60 might appear to be of good academic standard but may leave the student dissatisfied with his/her performance). This intrinsic setting is a structured process within which the student (as a learner) judges the activities (such as lectures and seminar participation assessment, engagement, etc.) he/she has just performed or the quality in terms of breadth and depth of his/her learning. Nevertheless, to evaluate students' performance through their exam scores, Wooten (1998) suggest that one should consider students' talent through their scholastic aptitude test scores, their struggle through their attendance in classes and their assignment and educational environment through asking about course materials, class hours and classrooms. All these are likely to shape up students' intrinsic goals and expectations.

Given the above discussion, there is lack of research in the accounting education field that endeavours to determine the definition of success among accounting students. There is a strong call for exploring students' actual views towards their learning success in the universities as on-going debate residues concerning the roles of universities over general accounting education (Sugahara and Boland, 2014).

Endogenous Factors

Gender. Student gender can affect future career path, motivation and thus performance. The empirical evidence regarding the influence of gender is very inconclusive. Some studies have confirmed the positive relationship between gender and accounting students' academic

performance (Koh and Koh, 1999; Gracia and Jenkins (2003); Vickers *et al*., 2003). Other studies report that such relationship does not exist. (Nasser and Peel, 1998; Guney 2009)

Country of Origin. Previous studies have identified the influence of the cultural values and exposure to different educational systems. This factor needs to be controlled as the universities educate students coming from different backgrounds and learning styles (Hartnett *et al.,* 2003 and 2004).

Age. This factor proxies for maturity. The effect of age on accounting performance has been proved inconclusive as some studies report that mature students tend to be more conscious (Saljo, 1979; Lane and Porch, 2002). Nasser and Peel (1998) report, that there is no significant relationship between age and performance.

Work Experience. This factors accounts for any previous working experience as they can relate the accounting content with the labour market and their professional experience. Rudkin and De Zoysa (2007) study on the Australian accounting students found no relationship between students' employment and their work hours and their academic performance.

The Educational Level of Parents. This factor accounts for possible inter-generational links. Parental educational level is an important predictor of children's educational and behavioural outcomes (Davis-Kean, 2005). The level of educational attainment of parents could influence the academic achievement of their children. According to European Union Monitoring Report (2013), those students, whose parents have a tertiary level of education, perform significantly better in tests of science, reading and mathematical ability than do those whose parents have only basic schooling. So far there has been no attempt (to the best of our knowledge) to account for inter-generational links within the non-specialist provision.

Academic Experience. Having exposed to accounting subjects in the past may positively influence the performance of the students (Hartnett *et al.,* 2004). However, the findings in the literature are mixed. For example, Guney (2009) and Koh and Koh (1999) do not report any significant influence of the previous accounting knowledge.

Future Career. This factor entails the potential to account for the unobserved characteristics such as motivation. If accounting is perceived to be useful for the students' future career then a proportion of the variation when it comes to performance can be attributed to this

unobserved intrinsic motivation as Herr and Cramer (1996) and Stinebrickner and Stinebrickner (2003) suggest.

Engagement. Engagement with the module both in class and in terms of further independent study is predicted to enhance the academic performance of the students. Cheung and Kan (2002) and Wijewardena and Rudkin (1999) reinforce this proposition by reporting that student's active participation in the classrooms and overall engagement with the module as a catalyst for a positive and significant relationship with academic performance. In the same spirit, Ayob and Selamat (2011) report a significant and negative relationship between students' academic performance and their absenteeism in accounting modules.

Exogenous Factors

The inclusion of exogenous factors could only give a complete picture. It is vital and crucial to incorporate the students' views and perceptions concerning the overall quality of teaching and module delivery. By doing this we make our findings more robust and we can make an implicit comparison between endogenous and exogenous factors in terms of importance.

The empirical evidence on exogenous factors appears to be conflicting. Earlier studies used lecturers' qualifications as a proxy for lecturers' ability. This may be a possible explanation for the fact those studies reported no significant impact of lecturers' ability on students' performance. Heck *et al.,* (2002) argue that the lecturers' ability has no impact on students' performance whereas Hartnett *et al.,* (2003), Hall *et al* (2004) and Shaftel and Shaftel (2005) report exactly the opposite effect. Unlike the aforementioned studies, Guney (2009) employs a more thorough investigation for variety of exogenous factors (lecturers' ability, class size, structure of examinations, curriculum and module relevance) and finds significant statistical evidence that effective teaching can improve performance and student attitudes. The significance of the exogenous factors is also insinuated by the empirical evidence which focuses on the student interaction with the learning environment (Ramsden 2003; Jackling 2005).

Unlike the aforementioned papers which refer to the exogenous (and endoganous) factors theoretically, incidentally or restrictedly, this study employs a variety of endogenous and exogenous factors as part of two econometric models (Ordinal Probit and Ordinary Least

Squares) to assess and *forecast* multivariately or univariately the influence of various student-exogenous factors on their academic achievement.

Lecturer's Ability. The ability of the lecturer enhances learning through higher commitment and positive attitude which in turn results in students' adopting deep approach of studying. Certain academic skills, such as creativity, are found to be developed by deep approach of study among students. In contrast, improper teaching approach leads students to opt for surface learning and they tend to memorize and reproduce the content (Rockoff, 2004).

Curriculum. .Curriculum design, course development, use of well-developed course materials and assessment devices as well as further guidance and advising, are perceived as critical characteristics of effective teaching (Stout and Wygal, 2010).

Reading Material. The reading material factor includes the sub-factors of: using an easy to follow text book written to cover the needs of non-specialist students, instead of using an introductory accounting text-book; the provision of a number of relevant books to choose from; provision of relevant academic and financial press articles; the provision of additional reading in the form of clearly presented notes and exercises

Education Technology. Education technology refers to an institute's resources including infrastructure, physical equipment, internet facilities and libraries (Wößmann, 2003). Institutes with such facilities provides comfort and understanding of courses hence affecting their learning approaches and ultimate achievement

Assessment. The importance of the examination structure echoes Ramsden (1988; 2003), who argues that the most significant single influence on students' learning could possibly be their perception of assessment.

TABLE 1 – VARIABLE DEFINITIONS

Academic Performance	Ordinal variable taking on four values. The students were asked the following question: "Reflecting on your performance did you perform: 1: Weaker than you expected; 2: About what you initially expected; 3: Better than expected; 4: Significantly better than you expected"
Gender	Binary Variable. 1 if the student is Male; 0 if the student is Female.
Country of Origin	Binary Variable. 1, if the student is British; 0, otherwise
Age	Age of the Student (in years) when he/she took the not-for specialists accounting module
Work Experience	Binary Variable. 1, if the student had work experience before taking the non-specialist accounting module; 0,otherwise (Based on the International Standard Classification of Occupation ISCO-88 (International Labour Office - Geneva 1990))
Academic Experience	Binary Variable. 1, if the student previously undertook an accounting module; 0, otherwise
The Educational Level of Father (Degree)	Binary Variable. 1, if the father of the student studied in University and obtained a degree; 0, otherwise
The Educational Level of Mother (Degree)	Binary Variable. 1, if the mother of the student studied in University and obtained a degree; 0, otherwise
Future Career	Binary Variable. 1, if the student thinks that accounting will be useful for his/her future career; 0, otherwise
Engagement	Ordinal Variable. 1: No Engagement; 2: Basic Engagement; 3: Engaged Well; 4: Engaged Very Well
Importance of the Lecturer's Ability	Ordinal Variable:1 Not Important at all …5: Very Important
Importance of the Curriculum Design	Ordinal Variable:1 Not Important at all …5: Very Important
Importance of the Reading Material	Ordinal Variable:1 Not Important at all …5: Very Important
Importance of the Education Technology	Ordinal Variable:1 Not Important at all …5: Very Important
Importance of the Assessment	Ordinal Variable:1 Not Important at all …5: Very Important

3. THE ECONOMETRIC MODELS

In line with the objective of the study, the measure of the dependent variable is based on the sampled students' perceived academic achievement. By using the following models, we attempt to address what affects academic achievement of non-specialist accounting students. It is assumed that the potential factors associated with students' performance can be two-fold: student-exogenous and student-endogenous factors. The details of all the variables are shown in Table 1.

We use two econometric methods is order to investigate and assess the impact of endogenous and the exogenous factors on academic performance: (i) Ordinal Probit and (iii) Ordinary Least Squared. The Ordered Probit model is appropriate for many applications in empirical research where the dependent variable of interest is ordinal (Peel *et al.,* 1998). Hence, in Ordinal Probit the outcome (dependent) variable has categories in meaningful order and our dependent variable is not an exception. As an alternative we also employ a conventional Ordinary Least Squares approach as the latter has been identified by the empirical evidence as the most popular one. In both cases the dependent variable is the academic performance ("Reflecting on your performance did you perform: 1: Weaker than you expected; 2: About what you initially expected; 3: Better than expected; 4: Significantly better than you expected". See Section 2 and Table 1). In ordinal probit, an underlying score is estimated as a linear function of the independent variables and a set of cutpoints (the alphas). The probability of observing outcome *i* corresponds to the probability that the estimated linear function, plus random error, is within the range of the cutpoints estimated for the outcome

$$Prob(Y_i = i \mid) = X_i'\beta + \varepsilon_i \quad \text{Eq. 1}$$

X: vector of endogenous and exogenous factors as described in Table 1

β: vector of coefficients to be estimated

ε: error term

i = outcomes (1: Weaker than you expected; 2: About what you initially expected; 3: Better than expected; 4: Perform significantly better than you expected)

The Ordinal Probit chooses estimates β to maximise the $\Sigma\ln(p_i)$ where p_i is the estimated probability of the observed response and the summation is overall of the observations in the dataset. For a four-outcome ordinal response with outcomes labelled *i=1-4*, the probability of observing outcome *i* is

$P_1 = \Phi(\alpha_1 - Xi\beta)$

$P_2 = \Phi(\alpha_2 - Xi\beta) - \Phi(\alpha_1 - Xi\beta)$

$P_3 = \Phi(\alpha_3 - Xi\beta) - \Phi(\alpha_2 - Xi\beta)$

$P_4 = 1 - \Phi(\alpha_3 - Xi\beta)$

Where Φ is the cumulative normal distribution. The estimated probabilities sum to 1. Positive levels in the ordered probit regressions mean that the higher levels of the dependent variable are likely to be observed. (i.e. are estimated to occur with higher probability). In other words, a positive estimated coefficient in an ordered probit equation implies that that variable shifts the probability mass to the right, which increases the probability that the student will report significantly higher academic performance (i.e. the *fourth (the student performed significantly better than he/she expected) outcome*).

The Ordinary Least Squares model is described in Equation 2. This method is commonly used in the literature (e.g. Hartnett *et al*. 2004) and it is used as an alternative to Ordinal Probit model. *As we stated given the nature of the dependent variable the Ordinal Probit is considered to be more appropriate* (see Greene, 2012).

$$Academic\ Performance = \alpha + X_i'\beta + \varepsilon_i \qquad \text{Eq. 2}$$

X: vector of endogenous and exogenous factors as described in Table 1

β: vector of coefficients to be estimated

α: intercept

ε: error term

4. SAMPLE CONSTRUCTION

The study was conducted at a British university's management school. Starting with the students' views on the relevance of accounting to their future career, their expectations on the modules' level of difficulty before their enrolment, and their level of engagement during the learning process, we then present the students' evaluation of their overall experience and their rating in terms of importance of factors influencing the learning experience's overall quality.

Following to review of relevant literature, feedback from 15 out of 50 students on the pilot study questionnaire, and consultation with 10 accounting academics - experienced in designing and delivering non-specialist courses – we identified a series of endogenous (including intergenerational links) and five main exogenous factors with direct influence on the learning process.

The data for this study were collected through an on-line questionnaire. The purpose of the on-line questionnaire will allow us to make inferences from an adult population drawn from students whose field of study is not accounting. This allowed this research to then draw inferences regarding the students' perceptions and expectations. This also aligns with the view that 'quantitative data, analysis and methods are usually used with the positivist paradigm' (Morgan *et al* 2008: p.12). The survey questionnaire approach provides the best research method for obtaining primary quantitative data. That is, a literature review allowed the formation of a conceptual framework, but testing its application in practice is essential. Further reasoning for using survey instruments are due to them being amongst the more popular research methods which are employed in quantitative research. This is because they are easy to administer, provide responses that can be generalized to other members of the population and can be used to predict behaviour (Newsted *et al.,* 1998).

A structured questionnaire of 34 items was developed to collect the data. In our model we include 14 variables as we have to overcome problems of multi-collinearity, degrees of freedom and endogeneity between the dependent and the independent variables. The survey took place at a British university's business school, which was offering a range of non-specialist - instead of general introductory - accounting modules as part of its undergraduate and postgraduate programmes of study. Following to the identification of factors and sub-factors influencing the students' learning experience, an online questionnaire was developed

and sent to 1,000 students who took a non-specialist accounting module during their undergraduate or postgraduate studies through the academic years 2009/10, 2010/11, and 2011/12. The sample included a range of management, marketing, strategy, events and tourism, information systems, art and design, human resource management, law, and joint honours students. 232 students provided complete and valid responses to the questionnaire hence forming the final sample of the survey.

5. DESCRIPTIVE STATISTICS

Table 2 illustrates the basic statistics for the variables. Most of the statistics in Table 2, in line with the variable definitions in Table 1, are self-explanatory.

TABLE 2 – DESCRIPTIVE STATISTICS

FACTORS/VARIABLES	MEAN	MEDIAN	STANDARD DEVIATION	MIN	MAX
Academic Performance	2.62	3	0.90	1	4
Gender	0.50	0	0.50	0	1
Country of Origin	0.48	0	0.50	0	1
Age	21.45	19	2.35	18	52
Work Experience	0.25	0	0.43	0	1
Academic Experience	0.49	0	0.50	0	1
The Educational Level of Father (Degree)	0.39	0	0.49	0	1
The Educational Level of Mother (Degree)	0.18	0	0.38	0	1
Future Career	0.51	1	0.50	0	1
Engagement	2.94	3	0.68	1	4
Importance of the Lecturer's Ability	4.41	5	0.84	1	5
Importance of the Curriculum Design	3.42	4	1.15	1	5
Importance of the Reading Material	2.96	3	1.23	1	5
Importance of the Education Technology	2.26	2	1.26	1	5
Importance of the Assessment	3.38	3	1.19	1	5

Evaluating the sample structure, out of the 232 students 49.6 per cent were British, 35.3 per cent internationals and 15.1 per cent were form other EU countries. 52.6 per cent were females and 47.4 per cent males. The age distribution was from 18 to 52 years old with 75.5 per cent of the students being between 18 to 22 years old. 56 per cent of the students took a non-specialist accounting module during the first year of their undergraduate studies, 17.7 per cent during the second year, 1.3 per cent during the final year, and 25 per cent during their postgraduate studies.

In terms of prior knowledge of accounting 53 per cent of the students had no prior knowledge, 29.3 per cent considered their prior knowledge as basic, 15.1 per cent as good, and 2.6 per cent as very good. This variation in terms of prior knowledge is explained

through the diversity in terms of level of study and the student's prior occupation. For example out of those students who declared having good or very good prior knowledge of accounting 83.8 per cent had studied accounting in the past and 16.2 per cent had gained exposure to aspects of accounting or finance through their working experience before enrolling on their programme of study.

Considering the students' performance on the non-specialist accounting module included on their programme of study, 14 per cent perceived that their performance was considerably better than they expected, 49.1 per cent evaluated their performance as better than they initially expected, 22.4 per cent perceived that their performance matched their initial expectations and the remainder 14.7% thought that they performed worse compared to their expectations (see the final column in Table 3 below). The actual performance is reported in the final row of Table 3. Evaluating the sample findings with the module leaders of the respective modules the above percentages appear – with small variations per module - to broadly represent the overall students' performance.

Our data do not permit us to get the absolute final grade for the non-specialist module but our dataset does permit us to contrast the self-evaluated performance with the actual performance. As Table 3 reports there is clear misalignment of what is viewed as a good mark and how the students evaluate their performance. This particular misalignment between perceived and actual performance opens up new avenues for future research.

TABLE 3-STUDENT ACTUAL PERFORMANCE (BANDED GRADES) vs. SELF-EVALUATED PERFORMANCE (*FREQUENCIES*)

	Final Grade 0-39	Final Grade 40-49	Final Grade 50-59	Final Grade 60-69	Final Grade 70-100	Total
Your Performance was…						
Weaker Than Expected	0	1	5	17	11	34 (14.7%)
About What Was Expected	3	8	21	19	1	52 (22.4%)
Better Than Expected	12	54	37	11	0	114 (49.1%)
Considerably Better Than Expected	15	12	4	1	0	32 (13.8%)
Total	30 (12.9%)	75 (32.3%)	67 (28.9%)	48 (20.7%)	12 (5.2%)	232

Correlation Matrix

The correlation matrix (see Table 4) illustrates the *univariate* relationship between the variables used in the analysis. We indicate whether the pair-wise correlation coefficient, which ranges from -0.319 to 0.553 is statistically significant. The purpose of the correlation matrix is to reassure that multi-collinearity is not present as the magnitudes (and the significance) of correlation coefficients between explanatory variables are minor to moderate.

The rationale behind the significance of the exogenous factors can be verified by examining the relationship between the dependent variable (academic performance in accounting) and the exogenous variables, which is quite pronounced and significant.

TABLE 4 – CORRELATION MATRIX

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	1														
2	-0.114	1													
3	0.034	-0.103	1												
4	0.104	-0.092	-0.101	1											
5	-0.004	0.034	0.055	0.519***	1										
6	0.069	0.076	0.037	0.066	-0.028	1									
7	0.040	-0.043	-0.319***	-0.066	-0.060	-0.093	1								
8	0.064	-0.009	-0.266***	-0.043	-0.130	-0.048	0.552***	1							
9	0.193	0.018	0.002	0.034	-0.064	-0.007	0.043	0.041	1						
10	0.500***	-0.047	0.005	0.068	-0.099	0.153	0.017	0.065	0.147**	1					
11	0.242***	-0.009	0.076	-0.059	-0.030	0.121	0.059	0.045	0.089	0.190***	1				
12	0.196***	-0.116*	0.059	-0.033	-0.094	0.195**	-0.057	0.115	0.016	0.063	0.048	1			
13	0.135	-0.054	-0.039	0.197**	0.034	0.263*	0.010	0.061	-0.044	0.218***	-0.101	0.082	1		
14	0.050	0.012	-0.111*	-0.012	-0.015	0.172***	-0.027	-0.041	-0.070	0.067	-0.176***	0.100	0.249***	1	
15	-0.241***	0.079	0.046	0.011	0.096	0.118*	-0.045	-0.212***	-0.059	-0.170***	-0.209***	-0.123*	-0.0106	0.184***	1

The numbers in the correlation matrix for each factor refer to: **1** Academic Performance; **2** Gender; **3** Country of Origin; **4** Age; **5** Work Experience; **6** Academic Experience; **7** The Educational Level of Father(Degree); **8** The Educational Level of Mother (Degree); **9** Future Career; **10** Engagement; **11** Importance of the Lecturer's Ability; **12** Importance of the Curriculum Design; **13** Importance of the Reading Material; **14** Importance of the Education Technology; **15** Importance of the Assessment

***: show that the correlation coefficient is significant at the 1% level
**: show that the correlation coefficient is significant at the 5% level
*: show that the correlation coefficient is significant at the 10% level

6. REGRESSION RESULTS

Table 5 shows the effects of exogenous and endogenous factors of student performance on accounting for non-specialists. The dependent variable is the reported student performance as analysed in the previous sections. We employ two different models (Ordinal Probit and Ordinary Least Squares) in order to assess the impact of exogenous and endogenous variables. Both models produce exactly the same results when it comes to the sign and the significance of the estimated coefficients.

TABLE 5 – THE EFFECT OF EXOGENOUS AND ENDOGENOUS FACTORS ON STUDENT PERFORMANCE (Heteroscedasticity consistent estimates for *both* models)

	ORDERED PROBIT		OLS	
FACTORS/VARIABLES	Coef.	Robust Std Errors	Coef.	Robust Std Errors
Constant			-0.230	*0.500*
Gender (Male)	-0.182	*0.141*	-0.096	*0.095*
Country of Origin	0.126	*0.156*	0.067	*0.103*
Age	0.019	*0.016*	0.010	*0.010*
Work Experience	0.087	*0.209*	0.084	*0.135*
Academic Experience	-0.167	*0.203*	-0.097	*0.137*
The Educational Level of Father (Degree)	0.154	*0.175*	0.099	*0.117*
The Educational Level of Mother (Degree)	-0.064	*0.181*	-0.061	*0.122*
Future Career	0.333***	*0.152*	0.208**	*0.101*
Engagement	0.824***	*0.116*	0.549***	*0.070*
Importance of the Lecturer's Ability	0.217**	*0.098*	0.147**	*0.067*
Importance of the Curriculum Design	0.164***	*0.067*	0.116***	*0.044*
Importance of the Reading Material	0.026	*0.068*	0.021	*0.046*
Importance of the Education Technology	0.078	*0.066*	0.050	*0.044*
Importance of the Assessment	-0.151**	*0.069*	-0.098**	*0.046*
α_1	2.949			
α_2	3.915			
α_3	5.643			
Number of Observations	232		232	
Log-Likelihood	-240.36			
Pseudo – R^2	0.1638			
Wald χ^2 (14)	86.41			
Prob > χ^2	0.000			
R^2			0.3443	
F (14, 217)			11.33	
Prob > F (14, 217)			0.000	

Notes: See Table 1 for the definitions of the variables.
Standard errors robust to heteroscedasticity.
(***), (**) and (*) denotes that coefficients are significant at the 1%, 5% and 10% level, respectively.
Wald χ^2 test and F–statistic tests the overall significance of the model.

Our results show the dominance of the exogenous factors compared to the endogenous ones. Consistent with the previous studies (see Eskew and Faley, 1988; Gist *et al*., 1996; Guney, 2009) gender does not play a significant role when it comes to performance either absolute (as the previous evidence suggests) or perceived (as our study suggests). There is tendency that males perform worse than the females but this relationship is not meaningful. Like Rankin et al, 2003, British-born students tend to perform better than their European and International counterparts but we cannot detect any meaningful relationship. The coefficients on age turn out to side with the findings reported by Nasser and Peel (1998) and Koh and Koh (1999) who find that age has no significant impact on the performance of the accounting student whereas Guney (2009) reports the opposite. Given that our sample predominantly entails students from 18 to 22 years old (75 per cent of the sample) the effects of mature students appear to be suppressed. Notably, the coefficient is positive. In line with the previous empirical evidence (Koh and Koh, 1999; Rankin *et al*., 2003; Guney 2009), experience (both academic and labour market) is not associated significantly with the performance. The results point to the direction that having studied accounting previously and/or having accumulated some working experience does not enhance students' likelihood to outperform those who have not. Our study has also taken into consideration the so-called intergenerational links. We specifically tested the hypothesis that having at least one parent who obtained a degree would "inspire" the student to perform better. Both variables, although they reveal some interesting insights on the different role played by the parents, fail to attain to any conventional levels of significance. Like Guney (2009), the coefficient regarding future career is expectedly significantly positive. Therefore, it is evident that students when they associate their studies with their future career tend to work hard at or pay more attention to the subjects that they believe would be useful for their career. It may also be that the area they choose for a career depends on whether they are academically successful in that area. Finally, in line with McCabe (1991), Wijewardena and Rudkin (1999) and Ayob and Selamat (2011) an interactive environment encourages participation and discussion of the students and promoting thereby deeper learning and skills enhancements. Therefore, *future career goals and engagement boost the likelihood of students performing better than they expected.*

Turning into the exogenous factors, the results imply that students' satisfaction and the relative importance given to these five exogenous factors significantly affect the performance in accounting with the ability of the lecturer turning out to be of the utmost importance. The

ability to effectively communicate knowledge to heterogeneous groups of students, instead of just implementing or presenting its technical part appears to be at the forefront of a modern lecturer's required skill-set. On the other hand, Biggs (2003) suggests that lecturers usually know very well the theoretical concepts of their discipline, but they appear to have limited knowledge of theories about how to teach it. This leads to the necessity of developing additional skills in order to achieve effective knowledge transfer (Boles and Pillay, 1999). Developing teaching strategies by integrating elements of diverse learning styles and taking into account cultural issues can be helpful in providing a good learning experience for the students (Ramsden, 2003; Turner, 2006;). students. In line with Stout and Wygal (2010) and McPhail (2003) and Thomson and Bebbington (2003) point to the (accounting) curriculum design and delivery with a view to covering areas which address the needs and the expectations the students. Our results imply that that considering how one teaches is equally important as considering what is taught.

On the other hand, the coefficients on the education technology and the reading materials although positive fail to attain to any conventional levels of significance. On the surface this may be surprising but a thorough analysis of the student responses reveals that education technology and reading material were perceived as most important by only 1.3 and 6.5 per cent of the participants respectively. Furthermore, the insignificance of the correlation coefficients between performance and the two aforementioned exogenous factors lends further support to our finding (see Table 4). Finally, the students who consider the assessment as the most important aspect or students who prioritise the variety of assessment elements turns out to significantly supress the likelihood of exceeding their expectations. Reviewing the literature on learning outcomes and assessment in accounting education, one sees two primary lines of inquiry, outcomes assessment and classroom assessment techniques. Outcomes assessment focuses on institutional attempts to assess a range of educational outcomes in the current environment of higher education. Classroom assessment takes account of techniques to evaluate learning within the scope of the individual instructor, aiming to improve teaching effectiveness (see Kimmel *et al*. 1998, Moncada and Sanders 1998, Geiger and Higgins, 1997). However none of the above appears to take account of the needs of individuals who only want to develop an insight into accounting from a manager's viewpoint and to focus on using and understanding, rather than preparing accounting information.

FORECASTING AND SIMULATIONS

Assume that a student *j* has characteristics Xi such that -Xiβ = -0.7 (model coefficients multiplied by the characteristics of the student). Then the estimated probability that student *j* reports overall outcome of 4 (*the student performed significantly better than he/she expected*) is:

$1 - \Phi (\alpha_3 + Xi\beta)$

The cutoff point α_3 has already been calculated (see Table 5) and Φ as it was stated is the cumulative normal distribution.

The alphas help us determine the intervals of the latent index of utility (Y*) that are mapped into the categories of outcomes

$Y^* \leq \alpha_1 \rightarrow$ Outcome = 1
$\alpha_1 < Y^* \leq \alpha_2 \rightarrow$ Outcome = 2
$\alpha_2 < Y^* \leq \alpha_3 \rightarrow$ Outcome = 3
$Y^* > \alpha_3 \rightarrow$ Outcome = 4

In order to quantify the significance of the size of the estimated confidents (see Table 5), Table 6 below displays, for a number of hypothetical cases, the predicted probabilities of the alignment between actual academic performance and prior expectations (in other words what the dependent variable shows us). The third row shows the probability of reporting outcome 1, 2, 3 and 4 ("Reflecting on your performance did you perform: 1: Weaker than you expected; 2: About what you initially expected; 3: Better than expected; 4: Significantly better than you expected") based on the "average" person in the sample (estimated at the sample means). The fourth, fifth, sixth and seventh rows focus on the probability of reporting each outcome for students with the following characteristics:

- *Student 1:* Male, British, Aged 20, no previous work experience, both parents did not attend university, *no* previous accounting knowledge, accounting is useful for future career and level of engagement: 3 (Engaged Well). All the other factors are set to their means (Importance of the Lecturer's Ability: 4.41; Importance of the Curriculum Design: 3.42; Importance of the Reading Material: 2.96; Importance of the Education Technology: 2.26; Importance of the Assessment: 3.38 - See Table 2 for the means values).

- *Student 2:* Female, British, Aged 20, no previous work experience, both parents did not attend university, *no* previous accounting knowledge, accounting is useful for future career and level of engagement: 3 (Engaged Well). All the other factors are set to their means (Importance of the Lecturer's Ability: 4.41; Importance of the Curriculum Design: 3.42; Importance of the Reading Material: 2.96; Importance of the Education Technology: 2.26; Importance of the Assessment: 3.38 - See Table 2 for the means values).
- *Student 3:* Male, EU/International, Aged 20, no previous work experience, only the father attended university, *no* previous accounting knowledge, accounting is useful for future career and level of engagement: 3 (Engaged Well). All the other factors are set to their means (Importance of the Lecturer's Ability: 4.41; Importance of the Curriculum Design: 3.42; Importance of the Reading Material: 2.96; Importance of the Education Technology: 2.26; Importance of the Assessment: 3.38 - See Table 2 for the means values).
- *Student 4:* Female, EU/International, Aged 20, no previous work experience, only the father attended university, *no* previous accounting knowledge, accounting is useful for future career and level of engagement: 3 (Engaged Well). All the other factors are set to their means (Importance of the Lecturer's Ability: 4.41; Importance of the Curriculum Design: 3.42; Importance of the Reading Material: 2.96; Importance of the Education Technology: 2.26; Importance of the Assessment: 3.38 - See Table 2 for the means values).

TABLE 6– THE PROBABILITIES FOR EACH OUTCOME BASED ON THE ORDINAL PROBIT COEFFICIENTS ESTIMATED IN TABLE 5

	PROBABILITIES FOR EACH ACADEMIC PERFORMANCE			
Typical Student Profile	**1: Weaker than you expected**	**2: About what you initially expected**	**3: Better than expected**	**4: Perform significantly better than you expected**
Average Student	09.11%	26.54%	55.64%	08.68%
Student 1 (Male, British)	07.47%	24.25%	57.74%	10.52%
Student 2 (Female, British)	05.22%	20.32%	60.22%	14.21%
Student 3 (Male, Non-British)	07.08%	23.65%	58.21%	11.03%
Student 4 (Female, Non-British)	04.93%	19.72%	60.47%	14.85%

First of all the most striking outcome is that the "average" or the four representative non-specialist students are more likely to report an academic performance in accounting which is better than they initially expected (outcome 3). The non-specialist students tend to deem the exogenous factors (such as lecturer's ability and curriculum design) as very important and the actual realisation of lecturer's ability boosts their academic performance together with certain endogenous factors such as engagement and future career plans. These estimated probabilities provide a good quantitative impact of various endogenous and exogenous characteristics on the likelihood of reporting each of the four distinct perceived performance outcomes.

The first row shows that, estimated at sample means, the empirical probability of a non-specialist student in accounting reporting an academic performance weaker than he/she was expecting is 9.11%, reporting an academic performance in line with his/her initial expectation is 26.5% reporting an academic performance better than he/she expected 55.64% and reporting an academic performance considerably better than he/she was initially expected is 8.68%. These results confirm from a different viewpoint the role played by the exogenous factors which appear to help the non-specialist students to attain to a performance which is perceived better than the students were initially expecting.

Our representative male non-specialist accounting student 1 is far more likely to report that his performance is better or considerably better compared to his initial expectations than the *"average"* non-specialist student (see row 1), recording a 57.74% chance of reporting a better academic performance than he initially expected and 10.52% likelihood of reporting a considerably better performance than he initially expected. Consequently, the estimated probabilities of weaker academic performance or academic performance in line with the initial expectations are reduced compared to the "average" non-specialist student. The representative female non-specialist accounting student 2 who has exactly the same characteristics as student 1 also has an above-average probability of better-than-expected academic performance peaking at 60.22% for outcome 3.

Student 3 (male and non-British – *i.e. European or Overseas*) and student 4 (female and non-British-*i.e. European or Overseas*) are representative non-specialist international student cases and the only difference compared to their British counterparts is that their father attended a University. Both representative non-specialist students have higher probability of reporting a better or a considerably better than expected academic performance compared to

the *"average"* non-specialist accounting student. Consequently these non-specialist non-British students record lower estimated probabilities of academic performance which is in line with their initial expectations or weaker than what they initially expected.

7. CONCLUSIONS

Andragogy literature in accounting education is mainly addressing issues relevant to students taking specialist or introductory accounting courses. However, this approach makes it impossible to identify the underlying trends and expectations amongst the non-specialist students who have studied non-specialist accounting modules and they are likely to make use of their knowledge in the future. Focusing on the underlying identification of students whose field of study is other than accounting, this study makes four important contributions to relevant andragogy literature. First, we use an innovative measure of academic performance, which takes into account the students' own unobserved intrinsic goals of what is good academic performance (as outlined in Section 2). The data presented in Table 3 for the non-specialist accounting students confirm the role played by these unobserved intrinsic expectations by baring the misalignment of the initial expectations and the subsequent actual performance in non-specialist provisions. Noticeably, this finding opens up new avenues in research for both specialist and non-specialist provisions. Second, by designing and implementing an econometric estimation strategy certain endogenous and exogenous factors identified by the literature but discussed predominantly theoretically or in isolation have been taken simultaneously into account. Third, multivariate analysis in the form of Ordinal Probit (and Ordinary Least Squares) leads to the conclusion that there are certain exogenous factors (such as lecturer's ability) and then endogenous factors (based on the size of the estimation coefficients and the corresponding significance levels) which boost the academic performance of the non-specialist students compared their initial expectations. Fourth, the empirical results are consistent with the exogenous factors hypothesis, which pays particular attention to lecturer's ability and curriculum design. We run a series of simulations which show us that the likelihoods of reporting an academic performance better or considerably better than what the non-specialist student expected are on average 55.64% and 08.68% respectively. We also considered four representative students (British and non-British) and the empirical probabilities are slightly higher than the "average" student confirming the role played by a number of personal characteristics.

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