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What are the determinants of student performance on an undergraduate accounting degree?

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ABSTRACT

The objective of this study is to identify the factors which have a significant impact on the performance of students on an undergraduate accounting degree course. Previous research in this area has taken place over many years and has considered a number of factors which might influence performance such as: prior academic achievement, gender, age and numeracy. The findings of these studies have been quite mixed, perhaps reflecting differences in the institutions being considered, the courses analysed and the research methods adopted. This study follows a cohort of students who commenced an undergraduate accounting degree course at a UK University through to their graduation. It unites and tests all the key findings of the other previous studies in this area to determine the key factors affecting student performance. The results can inform universities in terms of their policies on admissions, teaching and retention and also inform students in deciding whether to apply for or continue with an accounting course. The results will also be of interest to academics delivering accounting courses and those with an interest in accounting education.

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Attainment; undergraduate students; accounting

Introduction

The initial idea for the study was inspired by the authors' roles as Course Leader and Recruitment Leader for an undergraduate accounting degree at a UK University. Both authors witnessed that wide variations in performance existed, but could there be a way to predict either on admission to university or part way through, how well students are likely to perform as a result of particular factors? The objective of this study is therefore to identify the factors which have a significant impact on the performance of students on an undergraduate accounting degree course.

Student recruitment and increased competition are a key concern for universities (Sá and Sabzalieva 2018). Student performance has an impact on university rankings, the reputation of the university, student applications and potentially survival in an increasingly competitive market. A competitive recruitment market may lead to universities lowering their course admission entry requirements to attract more students but this may impact on student performance. Previous research indicates that students with lower previous academic achievement do not perform as well (Duff 2004; Jansen and de Villiers 2016; Koh and Koh 1999; Seow, Pan, and Tay 2014). Lowering entry requirements may well help universities meet their course admission targets and associated income but the long-term effect could be increased pressure on academic staff to maintain pass rates and dissatisfied students struggling to progress through the course. This could impact on student satisfaction surveys leading to lower rankings which would have a negative impact on applications. The results of this study are therefore likely to be of interest to universities in terms of their future policies on admissions.

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Accounting degree courses typically attract exemptions from professional accountancy body examinations. ACCA, CIMA, ICAEW and other professional accountancy bodies will also be interested in the results of this study due to their links with universities and the fact that many students on accounting degree courses go on to study for professional qualifications.

Literature review

This study has developed from the authors' observations on the wide variations in the performance of students on the undergraduate Accounting courses. Some students do very well and graduate with first class or strong honours degrees. However, we have both witnessed students drop out early in the course either during or at the end of years 1 and 2. This may be through their own choice or due to failing multiple modules and being forced to leave the course due to assessment regulations. Others have to retake modules, spending more time at university and building up more debt before leaving often with no worthwhile qualifications. Therefore the authors felt that potentially there needed to be a way to predict, either on admission or part way through a course, how students are likely to perform as a result of particular factors. In this way, universities could help to ensure that students make choices which are right for them.

Non-continuation rates at universities in the UK in 2015/16 were 6.4%. This percentage figure has increased from 5.7% in 2011/12 (Higher Education Statistics Agency 2018b). Of all home students in the UK starting full-time degrees in 2015/16 more than 1 in 10 (10.5%) are expected to leave higher education without a qualification. This is a percentage that universities will want to minimise and having a greater understanding of the determinants of student performance should help. Critics of universities suggest that course fees are too high and that teaching methods, such as the use of lectures, have been slow to change with research prioritised instead of teaching leading to disappointing results. It is claimed that too many students fail to graduate and build up onerous levels of debt (Axtell, 2016).

The teaching of accountancy at universities is a relatively recent development (Stevenson et al. 2018). In the UK, the first accounting degree courses were not developed until the 1960s. Prior to this time, accountancy training was of a more practical nature in the form of apprenticeships combining work experience with the study of accounting. Previous studies have considered a number of factors which might influence performance on accounting courses, including prior academic achievement, gender, age and numeracy. The findings of these previous studies have been quite mixed, perhaps reflecting differences in the institutions being considered and the research methods adopted.

Student performance

Previous research in the area of student performance has used different measures of what constitutes student performance. Some studies have focussed on performance in particular subject areas; for example financial accounting (Jansen and de Villiers 2016) and business accounting (Guney 2009). Others considered final year degree classification, using a binary classification between those students who achieved a first or upper second class degree and those with lower second or third class degree (Gammie, Jones, and Robertson-Millar 2003). Other studies used the total grade points achieved in all modules in the final year of a degree programme (Gracia and Jenkins 2003; Koh and Koh 1999; Seow, Pan, and Tay 2014). This study will use the average mark achieved by students in their first (Level 4), second (Level 5) and final (Level 6) years at university as a measure of performance. The main focus will be on their final year (Level 6) performance as this equates most closely to their overall degree classification.

Prior academic achievement

Many studies, in a variety of countries, have found that prior academic achievement is significantly related to performance (Duff 2004; Jansen and de Villiers 2016; Koh and Koh 1999; Seow, Pan, and Tay 2014). The theory is that students who have performed well previously in secondary education

(at school and/or college in the UK) are expected to continue to perform well in higher education (at university). In their Singapore based study Seow, Pan, and Tay (2014), found that prior academic achievement was the most significant determinant of performance over the three years of the degree course. In the UK, both Duff (2004) and Byrne and Flood (2008) found that prior academic achievement was the most significant determinant of performance, although these studies only considered the early years rather than the full duration of the course. Other studies by Bartlett, Peel, and Pendlebury (1993) and Gammie, Jones, and Robertson-Millar (2003) contradict this and did not find a significant relationship in prior academic achievement. Brahmašre and Whitten (2001) also found no significant relationship but their study looked at the impact of secondary school grades on performance in professional accountancy examinations rather than an undergraduate course.

It is clear from reviewing the literature that there are many different ways of measuring prior academic achievement which makes comparisons more difficult. Koh and Koh (1999) measured 'academic aptitude' by students' average high school attainment. Seow, Pan, and Tay (2014) used students' two best non-mathematical subjects in order to isolate the effect of mathematical aptitude which they considered separately. Jansen and de Villiers (2016) used categorical variables to measure students' 'final year high school grades'. Bartlett, Peel, and Pendlebury (1993) looked specifically at whether students had passed Accounting, Economics and Business Studies exams.

One possible prior academic achievement measure for UK students is the UCAS (University and Colleges Admissions Service) Tariff. The UCAS Tariff is used for university admissions in the UK based on qualifications achieved. However, the UCAS Tariff is problematic due to the variations in qualifications which count towards the tariff. For example, a student could meet course entry requirements of 300 UCAS points by passing three A Levels with three B grades. Another student could meet the entry requirements by taking purely BTEC (i) qualifications which are based more around practical skills and evaluated on the basis of a portfolio of work rather than coursework and exams. Research suggests that a BTEC student is 16% less likely to achieve a first or upper second class degree than a student who joined with the equivalent A level grades (Myhill and Morgan 2019).

Early years' performance

A number of studies have looked at performance in the early years at university and found a significant positive correlation with overall performance. Jansen and de Villiers (2016) looked at performance in Year 1 and Year 2 and found these results to be highly significantly related to the performance in Year 3. Gracia and Jenkins (2003) found a similar pattern and suggested that students with relatively poor marks in the first year should be supported and counselled. Gammie, Jones, and Robertson-Millar (2003) highlighted the importance of early academic performance and developed a model to try and predict the probability of a student achieving at least an upper second class degree. They found that the key determinants were performance on particular accounting modules and also whether students had to re-sit any examinations. They suggested that students who demonstrate weak performance should be counselled regarding the appropriateness of continuing with their current studies.

However, some previous studies in this area find no significant relationship between grades in an introductory financial accounting class and performance in the second year of the accounting course (Doran, Bouillon, and Smith 1991). The measurements used in previous research on the impact of early years' performance are more consistent than those in the previous section, prior academic achievement. Typically, measurement is based on the average mark of all modules studied in the first and/or second years at university (Gracia and Jenkins 2003). Some studies focussed on performance on specific modules (Gammie, Jones, and Robertson-Millar 2003; Jansen and de Villiers 2016).

Mathematical aptitude

As the study of accounting requires quantitative and numerical skills it might be expected that those students with strong mathematical aptitudes perform better. However, previous studies have reported mixed results on the impact of mathematical aptitude on the performance of accounting students.

Many studies found that mathematical aptitude was significantly related to performance (Gunev 2009; Koh and Koh 1999; Seow, Pan, and Tay 2014). Koh and Koh (1999) conclude that the significant impact of mathematics found in their study, and in previous studies, establishes mathematical aptitude as a universally important determinant of performance and suggest that it should be a prerequisite for admission to accountancy degree programmes.

However, other studies did not find any association, possibly attributable to the more qualitative skills also required in the subject (Gammie, Jones, and Robertson-Millar 2003; Bartlett, Peel, and Pendlebury 1993; Gist, Goedde, and Ward 1996). More recently, Jansen and de Villiers (2016) found a positive, but not statistically significant relationship between mathematical aptitude and performance but suggested this could be as a result of their tutors addressing mathematical issues in class.

There is some variation with regard to how previous studies have measured mathematical aptitude. Most studies, for example Jansen and de Villiers (2016) and Gammie, Jones, and Robertson-Millar (2003) used students' secondary school mathematics grade. Seow, Pan, and Tay (2014) were able to use students' A Level grade as all their course entrants were required to have studied mathematics at this level.

Gender

Many researchers have looked at the impact of gender on academic performance, but the results have been quite mixed. Jansen and de Villiers (2016); Seow, Pan, and Tay (2014), Brahmashrene and Whitten (2001) and Koh and Koh (1999) all found that gender is significantly related to performance with males outperforming females. Other studies found the opposite to be true with females outperforming males (Alfan and Othman 2005; Mutchler, Turner, and Williams 1986; Tho 1994). A third category of findings found no significant relationship between student gender and performance (Byrne and Flood 2008; Gammie, Jones, and Robertson-Millar 2003).

Both Seow, Pan, and Tay (2014) and Koh and Koh (1999) pointed out in their studies that male students were in the minority and outperformed females. Furthermore, Seow, Pan, and Tay (2014) suggest that males outperforming females in their study could be linked to males typically being two years older due to the requirement to undertake national service. Mutchler, Turner, and Williams (1986) found that females (also the minority) outperformed males suggesting that the minority gender may have the motivation to outperform the majority. A similar result with the minority males outperforming majority females was found by Jansen and de Villiers (2016), although they conclude that it is unclear why males outperform females and suggest that further research is warranted.

Gammie, Jones, and Robertson-Millar (2003) suggest that the majority of research in this area has found no gender difference in the performance of accounting students, particularly when other factors have been incorporated in to the analysis.

Previous study of accounting

In a similar way to prior academic achievement, one might expect that prior knowledge of accounting would have a positive impact on performance. However, there have been mixed results in previous studies on the impact of prior (secondary school) accounting knowledge on performance. Tho (1994), Eskew and Faley (1988) and Mitchell (1985) did find a significantly positive relationship between completion of an accounting course at secondary school level and performance at tertiary level.

According to Jansen and de Villiers (2016) and Byrne and Flood (2008), the majority of previous studies found no significant relationship, or even a negative relationship, between the previous study of accounting and performance in accountancy modules at university. Furthermore, for those studies that did find a positive relationship, most found the benefit to be short-lived and only really impacting on the first year at university. Koh and Koh (1999) suggested that such students may feel overconfident at the start of their studies and get in to bad habits, such as missing classes and not working as hard as their counterparts.

Some of the mixed results found in previous studies may be due to the difference in the measurement of what constitutes prior accountancy knowledge. This makes it difficult to interpret the findings. For example, Koh and Koh (1999) divided their sample in to two categories: those who had studied some accounting and business-related subjects formally for at least two years, and those who had not. Jansen and de Villiers (2016) used a similar binary split, but this was dependant on whether students had completed the final year of secondary school accounting.

Ethnicity

The attainment of Black and Ethnic Minority (BME) students has been the focus of a number of studies, with findings suggesting a significant difference in overall performance compared with white students. This 'ethnicity attainment gap' suggests that only 64% of BME students graduate with a first or upper second class degree compared with 79% of white students (Equality Challenge Unit 2017).

Richardson (2015) suggests that ethnic minority performance differences vary from one institution to another and from one subject to another and are only partly explained by differences in entry qualifications. This suggests that they result in part from teaching and assessment practices in different institutions and subjects.

It does not appear that any of the previous studies on the determinants of success on an accounting course have considered ethnicity. This study will therefore add to the previous research in this area by focussing on a particular subject and institution.

Work placement

In the UK, the Wilson Review (2012) followed on from a Department for Education and Skills, Higher Education White Paper (2011) which stated the need for stronger links between universities and employers. The Wilson Review emphasised the importance of a work placement period to the student learning experience. It also noted a decline in the percentage of undergraduate students going on work placement from 8.2% in 2002/3 to 5% in 2012/13 in the UK. This contrasts with a reported 55% of European graduates undertaking a work placement year (Little and Arthur 2010).

A recent UK study by Jones, Green, and Higson (2017), noted that previous research overwhelmingly supports the view that the completion of a work placement is associated with increased employability. Jones et al. also suggest that completion of a work placement leads to a better final year degree performance. Guney (2009) suggested that students may have a better understanding of accounting if they can successfully relate their studies to their professional experience in accounting areas.

Age and other variables

Previous research on the impact of age has resulted in inconsistent findings. Koh and Koh (1999) found that younger students outperformed older students, yet other studies found the opposite to be true and suggest that older students may be more mature (Bartlett, Peel, and Pendlebury 1993) or may be more motivated and disciplined than younger students (Van Wyk 2011). Other studies find

that age has no statistically significant relationship with student performance in an accounting degree programme in the UK (Gammie, Jones, and Robertson-Millar 2003).

It is clear that age can impact on performance in certain environments but as there is very little variation in the age of students on the BA Accounting course at this University (the vast majority are 18–21 years old), age will not be considered in this study.

A review of the literature has found that a number of other variables have been considered as potential determinants of student performance. These include admission interview performance and critical thinking skills (Seow, Pan, and Tay (2014)), study effort and attendance (Guney (2009)). Although some of these findings were interesting, it was deemed that these were too far out of scope for this study due to this university not conducting entrance interviews or monitoring attendance.

Research method

This study aims to take all of the above main findings, to collate and re-test them on this latest cohort of accounting students. This will be the first UK study on the determinants of student performance after the changes to University funding which has meant UK universities have become more commercially focused on student recruitment and retention (Institute of Fiscal Studies 2017). Previous literature found was based on data obtained outside the UK (Byrne and Flood 2008; Jansen and de Villiers 2016; Koh and Koh 1999; Seow, Pan, and Tay 2014; Waples and Darayseh 2005). Studies in the UK took place before the recent funding changes (Bartlett, Peel, and Pendlebury 1993; Duff 2004; Gammie, Jones, and Robertson-Millar 2003; Gracia and Jenkins 2003) or focussed on particular variables, such as attendance (Paisey and Paisey 2004) or work placements (Jones, Green, and Higson 2017).

The study focuses on a cohort of students on an undergraduate accounting course at the 11th largest university in the UK (Higher Education Statistics Agency 2018a). Data were obtained from the University's record system for all students starting the course. Ethical clearance to use the data was obtained on the basis that there would be no breach of student confidentiality.

The accounting course is a four-year sandwich course with students encouraged to go on a full-time work placement in their third year. Students who are unsuccessful in gaining a work placement continue directly on to the final year. In each academic year students study six modules and are awarded an overall mark per module. The first year is Level 4, the second year is Level 5 and the final year is Level 6. Course entry requirements were 300 UCAS points which equates to three grade B's at A Level or equivalent. The UCAS Tariff gives credit for a number of other qualifications, such as BTEC's which are regarded as less academic (Myhill and Morgan 2019). Entrants must also have achieved a minimum of grade C in both GCSE English and GCSE Mathematics.

A total of 134 students started the course in September. The expected graduation year for these students was in three or four years' time depending if they went on work placement. In total, 41 students did not graduate after those four years and were excluded from the study. Also excluded from the study were a further 12 students where the full set of data was unavailable, for example entry qualifications missing for international students. The analysis was therefore carried out on the remaining 81 students. Analysis was carried out in SPSS resulting in descriptive statistics, correlations and regression to investigate the association of the independent variables with academic performance. The reason for using these exploratory data analysis and statistical methods was an attempt to explore and compare the results of other previous studies in analysis of proposed key metrics (Bedeian 2014). It potentially also will allow for others who wish to reproduce (and confirm) this study's results.

Analysis and results

Table 1 presents a summary of the population studied. This table helps to identify the average profile of the cohort of the 81 students in the study in terms of their gender, ethnicity, previous qualifications and average marks achieved in their first (Level 4), second (Level 5) and final (Level 6) years at

university. This includes a comparison of the average profile of students of different gender, ethnicity and experience of placement year.

Entrants to the course had higher GCSE Maths average at A grade (1.16) than GCSE English average at B Grade (2.23). It is perhaps not surprising that an accounting course attracts students with stronger numeracy skills. All students in the cohort achieved the course entry requirement of C Grade (3.00) in both GCSE Maths and English.

The course entry requirement was 300 UCAS points. Students joining the course had 307 UCAS points on average, set within a wide range from 100 to 440 points. The UCAS tariff converts A Level grades and other qualifications into UCAS points. It is worth noting the students with less than 300 points are accepted on to the course through the UCAS clearing system which takes place approximately six weeks before the course start date. This system helps students who have not managed to find a place on a course by matching applicants to university places which are yet to be filled.

Entrants to the course had an average of just over two A Levels at Grade C or above. At least one student joined the course with no A Levels at Grade C or above. This illustrates the fact that some students joined the course with other qualifications counting towards the UCAS tariff, for example BTEC qualifications. BTEC qualifications are based around practical skills and evaluated on the basis of a portfolio of work rather than coursework and exams. Such qualifications are seen as less academic and rigorous than A Levels as referred to previously. This mix of qualifications making up the UCAS points variable needs to be taken in to account when considering the correlation and regression analysis which follows. Only a minority (22%) of students had an Accounting A level at Grade C or above. In terms of performance on the course, the average marks for this cohort of students were 61.7% in the first year (Level 4), 59.3% in the second year (Level 5) and 61.1% in the final year (Level 6).

Gender

Out of the total 81 students, 60 (74%) were male and 21 (26%) were female. On average, female students had better GCSE Grades (for both English and Maths), better UCAS points and more A Levels at Grade C or above. This is reflected in the overall measure of prior academic achievement with females averaging 67.5% compared with males averaging 65.4%. Females were also more likely to go on placement. In terms of performance at university, female students did slightly better at Level 4 (0.3%), then increasingly better at Levels 5 (1.5%) and 6 (3.4%). Independent samples t-tests indicate that none of the differences in means described above are significant.

Ethnicity

Out of the total 81 students, 59 (73%) were white and 22 (27%) were BME. On average, BME students were more likely to be male, had higher UCAS points but lower GCSE Maths and English grades and fewer A Levels at C or above. This indicates that, for BME students, UCAS points are likely to be made up of proportionately more non-A level qualifications such as BTEC. Looking at the overall measure of prior academic achievement, white students averaged 66.2% compared with 65.2% for BME students. BME students were less likely to go on placement. In terms of performance, BME students did better at Level 4 (4.6%) and Level 5 (5.1%) but almost the same at L6 (0.01%). Independent samples t-tests indicate that none of the differences in means described above are significant.

Placement

Out of the total 81 students, 48 (59%) went on placement and the other 33 (41%) continued straight to Level 6. On average, placement students had better GCSE Grades (for both English and Maths), better UCAS points and more A Levels at Grade C or above. Looking at the overall measure of prior academic achievement, students who went on placement averaged 66.8% compared with 64.8% for

Table 1. Descriptive statistics.

	Number	Mini mum	Maxi mum	Overall Mean	Gender Mean		Ethnicity Mean		Placement Mean	
				Overall (81)	Female (21)	Male (60)	White (59)	BME (22)	Non- placement (33)	Placement (48)
Maths GCSE	81	0	3	1.16	1.05	1.20	1.10	1.32	1.36	1.02
English GCSE	81	1	3	2.23	2.10	2.28	2.15	2.45	2.39	2.13
UCAS points	81	100	440	307.41	318.57	303.5	304.75	314.55	305.45	308.75
A Levels	81	0	3	2.14	2.29	2.08	2.15	2.09	2.06	2.19
Accounting A Level	81	0	1	0.22	0.19	0.23	0.19	0.32	0.21	0.23
Overall	81	46.25	76.25	65.97	67.53	65.43	66.23	65.27	64.78	66.79
Gender	81	0	1	0.74			0.78	0.64	0.82	0.69
Ethnicity	81	0	1	0.27	0.38	0.23			0.36	0.21
Placement	81	0	1	0.59	0.71	0.55	0.64	0.45		
L4 average	81	49.33	83.16	61.73	61.87	61.68	60.97	63.78	59.71*	63.12a
L5 average	81	41.5	86.33	59.3	59.94	59.08	58.48	61.5	55.98*	61.59a
L6 average	81	44	80.16	61.08	62.6	60.55	61.08	61.07	57.05**	63.84b

*Difference in means is statistically significant at the 0.05 level

**Difference in means is statistically significant at 0.01 level

those students who didn't go on placement. Placement students were more likely to be female and white. In terms of performance, placement students did better at Level 4 (5.7%), Level 5 (10.02%) and Level 6 (11.89%). Independent samples t-tests indicate that all of the differences in performance are significant.

Correlation

Correlations were calculated using Pearson correlation coefficients which is appropriate because the variables being studied are normally distributed. The direction of the correlation is positive if both variables increase together and negative if one variable increases as another decreases. This is why the Maths and English GCSE correlations are negative (a lower GCSE mean indicates a higher mark with Grade A* = 0, Grade A = 1, Grade B = 2 etc.).

Table 2 shows the correlations between the variables including all five individual measures of prior year achievement. Maths GCSE (taken at age 16) is the most strongly correlated of all the individual measures of prior academic achievement with the results significant at the 0.01 level. This suggests that mathematical aptitude at GCSE is positively associated with overall performance on this accounting degree programme.

There is a moderate positive correlation coefficient between going on a placement and performance at Level 6 (significant at the 0.01 level). The table shows a weaker, but still significant at the 0.05 level, correlation between going on placement and performance at Levels 4 and 5 indicating that students with better performance at Level 4 and 5 are more likely to go on placement.

The number of A Levels passed at C or above only has a moderate positive correlation with performance (significant at the 0.01 level at Levels 4 and 5 and 0.05 level at Level 6). English GCSE and UCAS points exhibit weak correlations. The fact that the correlation coefficients for A Levels at C or above are greater than that for UCAS points indicates a weaker correlation with those students whose UCAS tariff points includes non-A Level qualifications such as BTEC.

There is no significant correlation between Accounting A Level and performance at any level. The correlation actually becomes negative at Levels 5 and 6. This suggests that students with Accounting A Level have an advantage at Level 4 only.

There is no significant correlation between gender and performance and ethnicity and performance at any level.

The strongest positive correlation coefficients are between performance in the early years of study at university (at Levels 4 and 5) with overall performance. These correlations are highly significant at the 0.01 level.

Regression

Ordinary least squares multiple regression analysis was used to investigate the association of the independent variables with academic performance. The stepwise method is reported. The alternative forward and backward methods produced similar results.

On admission to university

The initial regression analysis which was conducted using all the independent variables known on admission to university: GCSE Maths, GCSE English, UCAS Points, A Levels (C or better), Accounting A Level (C or better) along with Ethnicity and Gender. Three separate models were built based on dependent variables of average marks at Levels 4, 5 and 6. The results indicate that the most significant predictor variable in all the models is GCSE Maths which is significant at the 0.01 level at Levels 4, 5 and 6. These results are in line with previous studies which also found that mathematical aptitude is a significant factor determining performance (Guneay 2009; Koh and Koh 1999; Seow, Pan, and Tay 2014).

Another significant predictor variable (again at the 0.01 level) is A Levels at C or above at both Levels 4 and 5. This suggests that the current admission system using UCAS points may be flawed and that a focus on GCSE Maths and A Levels may be more beneficial than purely using UCAS points.

Accounting A Level and Ethnicity were significant (although only at the 0.05 level) at Level 4 only. It is interesting to note that the ethnicity relationship is positive at Level 4 with BME students doing better overall than white students. UCAS points are a significant indicator at Level 6 (although only at the 0.05 level) and have a lower standard beta than GCSE Maths. Gender is not significant in any of the models.

The adjusted R2 reduces from Level 4 to Level 6 indicating that the proportion of the average mark which can be explained by the independent variables reduces as student’s progress through the course. This is not surprising as the models exclude performance in the early years at university which is likely to be significant.

The regression model with Level 4 as the dependent variable is shown below. The regression models for Level 5 and Level 6 dependent variables can be found in the Appendix 1.

During time at university

As the students move through the years the most significant indicator of performance on the new

Model	Unstandardized Coefficients		Standardised Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	58.739	2.048		28.684	.000		
A Levels	2.497	.701	.337	3.561	.001	.935	1.069
Maths GCSE	-3.543	.878	-.402	-4.033	.000	.841	1.189
Accounting A Level	4.076	1.728	.234	2.359	.021	.852	1.173
Ethnicity	3.190	1.511	.196	2.111	.038	.974	1.027

R2 = 0.603; Adjusted R2 = 0.363; F value = 10.847; p-value = 0.000

academic year is performance in the previous year. The regression model below shows that Level 4 performance is the only significant predictor of performance at Level 5 and is significant at the 0.01 level. The adjusted R² of the regression model at 0.601 is much higher than the equivalent in the previous models which excluded Level 4 performance. This indicates that Level 4 performance is a stronger indicator of performance at Level 5 than any of the variables known on admission to university.

Looking at Level 6 performance, the regression model below shows that Level 5 performance is the most significant predictor at the 0.01 significance level. Whether a student has been on

Model	Unstandardized Coefficients		Standardised Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1 (Constant)	-7.519	6.101		-1.232	.221		
L4 average	1.082	.098	.779	11.028	.000	1.000	1.000

R² = 0.606; Adjusted R² = 0.601; F value = 121.622; p-value = 0.000

placement is also a significant indicator at the 0.01 significance level. The adjusted R² of the regression model 0.634 and so this explains a higher proportion of the variation in the dependent variable (L6 performance) than all the previous models. All other prior academic achievement measures (including Level 4 performance) are insignificant. Ethnicity and Gender are also insignificant. The standard beta of Level 5 performance at 0.722 is much higher than placement Year 0.204 indicating that Level 5 performance is a much more important determinant than placement year.

Model	Unstandardized Coefficients		Standardised Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
2 (Constant)	23.728	3.364		7.054	.000		
L5 average	.595	.058	.722	10.266	.000	.925	1.081
Placement	3.444	1.189	.204	2.896	.005	.925	1.081

R² = 0.643; Adjusted R² = 0.634; F value = 70.293; p-value = 0.000

Discussion

This study provides evidence relating to the determinants of the overall performance of students on an undergraduate accounting course at a UK University.

Significant changes since 2012 in the UK include the removal of the cap on the number of students that universities can recruit from 2015/16. This has further increased the way in which universities have to compete for student applications. Also, more recently, a number of UK universities have offered students unconditional places on courses based on their expected rather than their actual grades. There has been criticism of this 'bums on seats' approach with some schools reporting a significant decrease in A Level pass rates and suggesting this is a direct result of students being offered unconditional places.

Prior academic achievement was found to be a significant determinant of overall performance. This corroborates the findings of Duff (2004), Jansen and de Villiers (2016), Koh and Koh (1999) and Seow, Pan, and Tay (2014). This information is important with regard to university admission policies and shows the importance of attracting students who have performed well in the past academically.

It is also important for students joining, or thinking of joining, an accountancy degree programme, particularly those with lower prior academic achievement. It would certainly be beneficial for course teams to be aware of 'weaker' students after admission so that measures can be put in place to monitor and support their progress.

Although the significance of prior academic achievement was in line with previous research, what was more interesting and surprising, when looking in more detail, was the strong correlation between performance and GCSE Maths an exam that UK students take nationally aged sixteen. The GCSE Maths correlation indicates the importance of basic numeracy skills on performance which could be taken in to account in admissions procedures or in the support given to weaker students in the early years at university. This supports the findings of Guney (2009), Koh and Koh (1999) and Seow, Pan, and Tay (2014). At this University, although Maths support is available it is on a voluntary basis.

There is also a strong correlation between performance and the number of A Levels achieved at C or above. It could be argued from these results that the number of A Levels at Grade C or above is a better indicator of overall academic ability than the more generic UCAS tariff points which include the arguably less academic BTEC qualifications. The results suggest that the current admission system using UCAS points may be flawed and that a focus on GCSE Maths and A Levels would be more beneficial than purely using UCAS points. In practice, this may be difficult to put in place as all students currently apply through the UCAS system.

In terms of overall prior academic achievement, it seems clear that students who have done well academically previously are most likely to continue to perform well at university. The big question for universities is do they want to prioritise student recruitment and income targets, or should they focus on recruiting a higher percentage of students who are most likely to do well? Short-term financial pressures may encourage universities to put more emphasis on meeting recruiting targets even if this means taking on less able students in terms of their prior academic achievement.

The long-term impact of this could be more dissatisfied students, worsening retention rates, poor student performance and demoralised tutors. Alternatively, universities could put more emphasis on the prior academic achievements of potential students. The short-term impact of such a change could see a fall in the number of students recruited together with a consequent negative impact on university finances. In the long term however, universities could see better retention rates, improved degree classifications, more satisfied students, better ratings for the university and more students wanting to join the course.

Students considering applying for an accounting degree course, expecting to only just meet the minimum entry requirements, who perhaps struggled with GCSE Maths and are now taking BTEC qualifications, may look at the results and wonder if their chances of graduating with a good honours degree are high enough. They may consider alternatives such as apprenticeship schemes rather than build up debt related to university course fees and living costs. On the other hand, students with stronger prior academic achievements who have done well in GCSE Maths may be encouraged to apply.

The performance of students in their first year (Level 4) and second year (Level 5) was also a significant determinant of performance in their final year (Level 6). These results were also expected, based on previous studies by Gammie, Jones, and Robertson-Millar (2003), Gracia and Jenkins (2003) and Jansen and de Villiers (2016) but could perhaps be acted upon more by universities. It is clear from the data that students who perform poorly at Level 4 are likely to continue to struggle throughout their time at university. Universities could be more pro-active at this time in their discussions and decisions regarding course progression and retention. Rather than continuing on a course in which they are unlikely to graduate with a good honours degree, it could be argued that students are given a predicted degree classification at the end of Level 4. Students can then decide whether to continue with the course. Although the university would lose fee income, unless the student transferred to another course, it could bring longer term benefits through improved degree classifications and more satisfied students as above.

From the authors' experience, data on past performance are under-utilised at universities. A lack of easily accessible data to track individual student performances means that course and module teams are unaware how students have performed in earlier years. Pass rates and average marks are monitored and discussed by faculty and department management without the background knowledge of students' prior academic achievements. This is not helped by having separate systems for admission and course performance data.

Further research in this area could develop a model based on prior academic achievement combined with performance at Level 4 to predict likely future overall performance which would be useful to both universities and students in terms of their future decision making. Whether universities would have the appetite for such a system is debatable. As with recruitment suggesting that students do not continue with a course impacts on fee income. From the authors' experience, the tendency is for universities to go the other way try and retain students who might be struggling on courses by encouraging tutors to maintain high module pass rates, compensating students in modules which they have failed, offering re-sits and re-registering students on modules.

The finding that gender was not a significant determinant of performance supports previous studies by Byrne and Flood (2008) and Gammie, Jones, and Robertson-Millar (2003). However, it is still important to recognise that a number of previous studies such as those by Brahmaire and Whitten (2001); Jansen and de Villiers (2016); Koh and Koh (1999) and Seow, Pan, and Tay (2014), have found a link between gender and performance. Taking in to account these mixed findings, further research on the impact of gender on the performance of accounting students would be valuable.

The finding that ethnicity (as measured by BME) is not a significant determinant of performance appears to contradict previous research by Richardson (2015) and a report by the Equality Challenge Unit (2017). This could be due to the particular circumstances of the study, being the first of its kind to focus on UK accounting students. It would be useful for more subject-specific research to be undertaken to see if similar results are found elsewhere for accounting students. Further research on ethnicity could also use a more detailed classification system than the rather simplified dichotomous variable of BME or White used in this study.

The results on the impact of a placement year were interesting and certainly this appears to be an area where more research could be undertaken. The study found that students who went on a placement year did perform better overall, supporting previous research by Guney (2009), Jones, Green, and Higson (2017) and Koh and Koh (1999). However, it is also clear that students who go on placement had performed better both on admission and during their early years at university. Further research in this area is required. Also, it is important to point out that the likely positive impact on employability of undertaking a placement year has not been considered in this study.

Previous study of accounting (in this case A Level Accounting) appears to have very little impact on overall performance. This supports the majority of previous earlier research findings including that by Byrne and Flood (2008); Jansen and de Villiers (2016) and Koh and Koh (1999). Although the correlation is positive at Level 4, it turns negative a Level 5 and Level 6. None of these correlations is significant. It is possible that some of these students find Level 4 relatively easy and then become complacent at Level 5 and Level 6.

It is also important to note that success in the final year of an accounting degree does not necessarily mean that students will have a successful career. Softer skills such as communication and group working do not always correlate with examination results.

Conclusion

This paper set out to investigate the determinants of student performance on an undergraduate accounting degree, a topic that is well researched but with its collective findings suggesting few if any key factors. This paper tested all the possible key metrics on a cohort of its own students to investigate and suggest metrics that might point a new light on students achieving success on an undergraduate accounting course.

The key findings are that previous academic achievement is a very strong determinant in undergraduate performance. As early as sixteen years old, mathematics results for students have a key impact on their ability to perform at university in accounting courses. This could point to a number of things such as level of application and ability of the student. But what is clear to both the student and the university is that a good grounding in basic maths must be achieved before applying to an accounting undergraduate course.

This also means that universities should also look at prior academic achievement when recruiting students. It's obvious that the majority of institutions do this when trying to maintain academic standards, but as commercial pressures continue to push for more students to join undergraduate programmes, care must be taken to provide extra tuition to enable the student who has achieved less previous academic success to catch up. The provision of help is given, but attendance is voluntary and therefore the take-up is low. Perhaps now armed with these data, it is time to either educate the students as to the need to take a basic maths course or indeed for the university to make this course compulsory.

It is also clear that prior academic achievement counts not just before university but also during the students' time with that particular institution. At every step of the way through the undergraduates' journey towards graduation there must be support mechanisms put into place which supports the students academically. There needs to be conversations and active engagement by the student to acknowledge their weak points academically and for the universities to provide academic support to prevent failure and to increase the students' chances of successfully graduating.

In terms of what should come next, the authors recognise that although this has been a study conducted over four years (for some of the students) the sample size is small and therefore it would be good to have the study replicated, either at this university on other courses, or in other institutions over different time-periods and different courses. This could help towards the creation of a predictive model for undergraduate success. This study and others would strengthen the understanding of the determinants of student performance on accounting courses at undergraduate level both here in the UK and beyond. Further research on the impact of prior academic achievement and subsequently overall performance will be valuable to all universities and any students considering furthering their academic studies.

Regression models on admission – Level 4 and Level 5 as dependant variable

Dependent Variable = **L5 Average**, Independent variables = GCSE Maths, GCSE English, UCAS Points, A Levels (C+), Accounting A Level (C+), Ethnicity and Gender.

Model	Unstandardized Coefficients		Standardised Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	54.265	3.035		17.880	.000		
A Levels	3.876	1.044	.376	3.713	.000	.967	1.034
Maths GCSE	-2.793	1.240	-.228	-2.252	.027	.967	1.034

R² = 0.474; Adjusted R² = 0.225; F value = 11.303; p-value = 0.000

Dependent Variable = **L6 Average**, Independent variables = GCSE Maths, GCSE English, UCAS Points, A Levels (C+), Accounting A Level (C+), Ethnicity and Gender.

Model	Unstandardized Coefficients		Standardised Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	54.038	4.658		11.602	.000		
Maths GCSE	-3.672	1.024	-.364	-3.586	.001	1.000	1.000
UCAS points	.037	.014	.258	2.547	.013	1.000	1.000

R² = 0.444; Adjusted R² = 0.197; F value = 9.574; p-value = 0.000

Disclosure statement

No potential conflict of interest was reported by the authors.

Notes on contributors

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Martin Roberts teaches across a range of related areas in the field of finance and accounting, specialising in management accounting. Due to his previous and ongoing involvement experience in industry at director level, he has the status of Fellow Chartered Management Accountant (FCMA), which is the highest award granted by the Chartered Institute of Management Accountants (CIMA). His industry experience comes from working for large FTSE100 companies such as, Cadbury's, Smith and Nephew, Rexam, Alliance and Leicester. For twelve years, as well as lecturing, he was also working with Eldon Electric Ltd as a consultant UK Finance Director. Martin's PhD is based on research into communication apprehension and communication self-efficacy in accounting students.

Martin has always been interested in ensuring accounting students are ready to add value to any organisation and as such, has been involved in publishing papers, presenting papers, and obtaining grants on pedagogic issues such as group work, communication apprehension and financial literacy. The experience obtained from both industry and teaching has allowed him to chair and be a member of several examination panels for the chartered and certified professional accounting bodies (CIMA, ACCA). He is also very proud to have been recognised by the students for his teaching efforts by being a recipient of Sheffield Hallam University's Inspirational Teaching Award - 2015, 2013 and 2019, and due to this success has been awarded the Vice Chancellor's Award for Teaching in recognition of receiving these previous three Inspirational Teaching Awards.

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