

The Impact of Student Characteristics on Academic Achievement: Findings from an Online Undergraduate Property Program

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Abstract

This study provides an empirical investigation into the impact of individual student characteristics on academic achievement in an online undergraduate property program. Using a multi-year data set over 2007-2012, the preliminary results from our OLS regressions show that there is a significant positive association between entry qualifications and academic achievement in an online undergraduate property program. In addition, student performance is significantly related to age and the grades the students receive in two core knowledge courses. The property education implications are also highlighted.

Keywords: online, property program, student characteristics and academic achievement

INTRODUCTION

Online or distance education is emerging as the new paradigm of modern education. Given the advancement of information and communication technology, online education has become a more viable method of learning (IBISWorld, 2013). Many higher education institutions have recognised the growing demand from individuals and businesses. These institutions have also increased the breadth of courses offered through online platforms (Kearsley, 2000). Massive Open Online Course (MOOC), which is a recent development in distance education, has further enhanced the growth of online education. Numerous top universities have launched various MOOCs. For instance, MIT and Harvard University have launched edX in recent years. In Australia, the online education industry is estimated to grow by an annualised rate of 14.4% over 2009-2014 to total of \$5.9billion (IBISWorld, 2013).

Currently, there are 13 Australian universities offer property programs. Importantly, 39% of these Australian universities offer online property education (API, 2013), reflecting that online property education is an important method of learning. Online education has numerous advantages such as offering greater flexibility (Ward and Newlands, 1998), encouraging critical thinking (Ivancevich et al., 2009) and enhancing virtual communication skills (Wan et al., 2008). However replacing on-campus face-to-face lectures with online education has many challenges. These include students should initiate the learning process and have some computer literacy (Dutton et al., 2002, Howell et al., 2003). These challenges are likely to have an adverse effect on student performance in online classes.

Although numerous studies have been done on property education, little study has done to examine the factors involved in external student performance. Importantly, numerous studies have shown that the differences in performance levels between external students and on-campus students (Dutton et al., 2002). Although these studies have provided valuable insights, most have dealt with non-property education. Importantly, Arbaugh et

al. (2010) also highlighted the importance of discipline-based studies. Therefore, it is critical to identify characteristics associated with successful online property students.

The aim of this study fills this gap by examining the impact of individual student characteristics on academic achievement. Specifically, this study identifies the factors related to student performance in a distance-learning property course offered in Australia. This paper contributes to the property education in a number of ways. Firstly, this is one of the limited studies of property education, particularly online property education. Secondly, this probably is the first study to examine the factors associated with external property student overall performance. Unlike Yam and Rossini (2012), we examined success factors in the property degree instead of a property unit or subject. The findings will offer further insights to course coordinators. The findings can be used for course advising in which course coordinators can advise a student whether he/she should do an online property degree. In addition, an enhanced understanding the impact of student characteristics may enable course coordinators to improve their early identification of “at-risk students”; thereby early intervention and supports can be provided to these students.

The remainder of this paper is organized as follows. The following section provides a literature review on property education. The predictors of student performance are also discussed. Section 3 details the data used and the methodological framework adopted. Section 4 reports and discusses the empirical findings, whilst the final section provides concluding comments.

LITERATURE REVIEW

In the business education literature, various potential determinants of academic success have been identified. These factors are university entrance examination results (Durden and Ellis, 1995, Newell and Mallik, 2011), prior experience (i.e. doing mathematics, English and economics in high schools) (Mitchell, 1988, Mallik and Lodewijks,

2010, Newell and Mallik, 2011), results in core business units (Allen and Carter, 2007), gender (Anderson and Benjamin, 1994), age (Didia and Hasnat, 1998), Language background (Grebennikov and Skaines, 2009).

Numerous property studies examine various issues on property education. Tu et al. (2009) and Ooi and Yu (2011) examined the major elements related to improving graduate real estate programs in the US and Singapore respectively. Hefferan and Ross (2010) identified several changes occurring within the property professions and in the tertiary sector in Australia in recent years. Newell et al. (2010) investigated student perceptions of the quality of Australian property education. Blake and Susilawati (2009) found that Australian property students have the appropriate level of technical and “soft-skills” to enter the property industry. Recently, Yam (2012) and Carter and Yam (2013) highlighted the effectiveness of tutorials and the role of tutors in enhancing the student learning experience.

The benefits of online property education have also been highlighted by Wolverton and Wolverton (2003), Cornish et al. (2009), Yam and Rossini (2012), Poon (2012, 2013). Importantly, Yan and Rossini (2012) compared the performance levels of internal and external students in a first-year property unit or subject. They found that external students performed better than internal students. In addition, Yam and Rossini (2013) revealed that formative assessment would enhance student performance in a first-study property subject.

However, no study has been done in the area of determinants of students’ overall academic success. There are only two exceptions. Allen and Carter (2007) found that performance in two required core knowledge courses serve as good predictors of overall academic success in the real estate degree. Newell and Mallik (2011) offered empirical evidence of mathematic background is an important determinant of success in the property degree. However, these studies do not examine the determinants of academic success in online property education. Given most universities moving towards online

property education delivery, it further highlights the need for an enhanced understanding of critical success factors in online property education.

DATA AND METHOD

Data

We collected data on students who completed their property degrees at the University of Western Sydney externally over 2007-2012. UWS is one of the few Australian universities offers property programs on-campus and externally. This offers us an enriched dataset and allows us to have a closer examination of online property education. The online undergraduate property program at UWS is a 4-year or 6-year distance programs. This study mode offers greater flexibility in light of the program is delivered in a part-time study mode. We also obtained data on overall property degree level performance (Grade Point Average), student age, gender, ATAR/UAI score, general maths at HSC, higher level maths at HSC, Economics at HSC and language background from university records. Data on students' results in core business units were also collected from university records. UWS ethics committee approval was also granted to access these data.

Table 1 presents the summary statistics. Overall, 126 external students were included in our analysis. The average GPA score was 4.5 out of 7. In addition, the average age of external students at graduation is 25 years old; higher than face-to-face students.

(Insert Table 1)

Method

An Ordinary Least Squares (OLS) regression was employed to examine the significance of the role of specific factors influencing academic success in the overall external

property degree level. Regression fits a linear function to the data and allows us to test the effects of several variables together on academic performance. The equation to be estimated is as follows:

$$GPA_i = \alpha + \beta_1 EntryQualification_i + \beta_2 Gender_i + \beta_3 Age_i + \beta_4 Language_i + \sum_{i=1}^4 HSCresults_i + \varepsilon_i$$

Where *GPA* is the overall grade point average at graduation, *EntryQualification* is the either UIA or ATAR score, *Gender* is a dummy variable in which males are 0 and females are 1, *age* is the age of a student at admission, *language* is a dummy variable in which English-speaking background is 1, whereas non-English-speaking background is 0. *HSCresults* are results in general maths at HSC, higher level maths at HSC, English at HSC and Economic at HSC.

RESULTS AND DISCUSSION

Overall Performance of External Property Students

Table 2 exhibits the estimated coefficients from regression analyses for a number of models to identify the significance of specific factors influencing academic success at the overall property degree level based on the GPA of 126 external property graduates over 2007-2012.

(Insert Table 2)

A number of points are noted from Table 2. Firstly, being consistent with the findings from previous studies (Durden and Ellis, 1995; Newell and Mallik, 2011), a positive and statistically significance coefficient of entry qualification was evident in Models I-V, suggesting that university entrance examination results have a significant positive relationship with academic achievement. The possible explanation for this finding could

be that students with higher UAI or ATAR scores were more familiar with the academic setting and had better study skills (Anderson and Benjamin, 1994, Cheung and Kan, 2002).

Another important success factor is age. Interestingly, a negative and significant age effect was observed, indicating that younger students did better in the online property courses. Although the results contrast with the common belief that older students usually do better on a program, results here are comparable to the empirical findings from Peiperl and Trevelyan (1997) and Grebennikov and Skaines (2009). As discussed by Peiperl and Trevelyan (1997) that younger students had more recently used to an academic environment and were likely perform in that environment. Another possible explanation is the academic achievement of mature students could be negatively affected by factors associated with family or work commitments. It should be noted that the online property program at UWS is a part-time study mode. Therefore, many external students are mature students who have family and/or work commitments. This also offers some indirect supports for the finding of Hunt et al. (2004) in which work commitments have a significance negative effect on academic achievement. Furthermore, Newell and Mallik (2011) also suggested that older property students are more focused on their property career goals.

On the other hand, we found that gender is not a good predictor of academic success, reflecting in the insignificant regression coefficient for gender. Thus, this supports the findings of Peiperl and Trevelyan (1997) and Newell and Mallik (2011) in which no significant difference between males and females being evident. There is also evidence to suggest that English as a first language does not have a significant impact, indicating that international students, including those that do not speak English as a first language are not significantly disadvantaged. This supports the findings of Halpern (2007) based on 127 students taking a business management module at London Metropolitan University.

In addition, little evidence is available to support that HSC subjects are significant in explaining the academic success of external students. Although the results are broadly

consistent with the findings of Newell and Mallik (2011), one difference was found. Interestingly, we found that neither general mathematics nor higher level maths at HSC is an important factor in academic success in the distance property degree. The difference can be attributed to different samples. It should be noted that this study focuses on external students, while Newell and Mallik (2011) included both external and on-campus property students in their studies. Result reported here also reinforces the findings of Dutton et al. (2002) and Yam and Rossini (2012) in which there are clear differences between external and face-to-face students. This also sees the importance of a dedicated study on external studies.

Overall, there is a significant positive association between academic achievement and entry qualifications. In addition, age is also an important determinant. However, student characteristics that were not found to have a significant impact on academic success include gender, language and HSC subjects.

Core Business Units

Given Allen and Carter (2007) found that performance in required core knowledge courses serve as good predictors of overall academic success in the real estate degree, we further controlled our baseline results by various core knowledge units (i.e. Accounting Information for Managers, Principles of Economics, Statistics for Business, Marketing Principles, Business Academic Skills) that are typically completed in their first 2 years of business studies (junior years). The results are reported in Table 3.

(Insert Table 3)

After the additional controls for various core business knowledge units, strong evidence is still available to suggest that entry qualifications and age are good predictors in determining academic achievement of external real estate students. Specifically, a positive and statistically significance coefficient of entry qualification is evident in all models. Similarly a negative coefficient of age is found in all models. Furthermore, no

evidence is available to support the notion of gender, language and HSC subjects have a significant impact on academic success in this online property program, reflecting that the baseline results are robust.

Interestingly, we also found that Accounting Information for Managers and Statistics for Business are two core business units that are significantly and positively related to students' ultimate GPA. This also suggests that both units are good predictors of overall academic success. Therefore, both units can serve as a screening mechanism that may identify students who are not adequately prepared for online property studies. However, no similar evidence is available for other core business units. This can be attributed to these units being less or non-quantitative subjects. Therefore, these units might not serve as a good predictor of an external's student success in light of the property degree requires high level of quantitative skills. As highlighted by Newell and Mallik (2011), professional accreditation requires students to have key competencies in specific core property and business areas. Importantly, many of these competencies require students with a strong understanding of financial mathematics concepts; thereby mathematics background is seen as an important determinant in the property degree. Therefore, top-performing students in both quantitative business units (AIM and SB) are more likely perform well in the overall property degree.

To sum up, our baseline results are robust to core business knowledge courses. Entry requirements and age have a significant impact on the overall success in the online undergraduate property degree. In addition, Accounting Information for Managers and Statistics for Business those are typically quantitative business units and taken in the earlier semesters of the property degree are good predictors in academic success.

Robustness Checks

Given the coefficients of determination produced by the regression models are low; a comparison of means test was also conducted to check the robustness of our regression results. First, we decomposed the sample into two groups based on the average entry

qualification scores (i.e. low and high). Thereafter, a pair-wise t-test was conducted to provide a more straightforward analysis of the performance of these cohorts in the online degree programme. Similar steps have also been taken for the variables of age, Accounting Information for Managers and Statistics for Business. The results are presented in Tables 4 and 5.

(Tables 4 and 5)

Results here suggest that those external students with a higher entry score outperformed the cohort with a lower entry score. Importantly, the differences are statistically significant at 1%. This suggests that entry qualifications appear to be a good predictor of GPA. Similarly, the results in Table 4 also exhibit that younger students did better than mature students. The results are consistent with the regression results in Table 2, reflecting the robustness of our regression results. Results in Table 5 also offer further evidence to support the finding of Accounting Information for Managers and Statistics for Business are good predictors of overall academic success. Students did well in both units outperform other groups significantly in the overall GPA. This further reinforced the robustness of our results in Table 3.

Overall, results here suggest that the regression results in Tables 2 and 3 are robust. Specifically, entry qualifications, age, results in Accounting Information for Managers and Statistics for Business are good predictors in academic success.

CONCLUSIONS AND PROPERTY EDUCATION IMPLICATIONS

This study investigated the impact of student characteristics on academic achievement in an online undergraduate property degree. The study was based on a sample of 126 external students who completed a taught undergraduate property degree at the University of Western Sydney between 2007 and 2012 via an online platform.

Results from this study indicated that entry qualifications and age have a significant impact on academic achievement. In addition, core business units (Accounting Information for Managers and Statistics for Business) are good predictors in academic success. The findings have some important property education implications. The findings may be used to influence admission policy in which entry qualification is a critical success factor. Given the Australian government aims to widen participation in higher education in which a target has been set to increase the proportion of Australians aged between 25 and 34 with a bachelor degree and above to 40% by 2025 (Commonwealth of Australia, 2009), this suggests that flexible online education delivery options will be an important part of meeting the goal. Besides, the goal is likely to increase the number of mature students entering higher education. However, mature-age students are likely to have working and family commitments. Given age is a critical success factor in academic success in an online property program, the importance to have the necessary skills in balancing work, study and family should be made clear to external students. In addition, the finding of this study suggests that the academic achievement of two core business units with a strong quantitative focus is likely to affect the overall performance of external students. Thus, universities could use both units as a screening mechanism to identify “at-risk students”. Collectively, the findings of this study may enable course coordinators to improve their early identification of “at-risk students”.

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Table 1: Descriptive Summary

Variables	Mean	Standard Deviation
GPA	4.500	0.759
EntryQualification	72.634	9.855
Age	24.572	1.451
Gender	0.777	0.417
Language	0.802	0.400

Table 2: Overall Performance and Student Characteristics

Model	I	II	III	IV	V
Constant	5.663 (5.398)***	5.667 (5.395)***	5.636 (5.364)***	5.638 (5.381)***	5.656 (5.384)***
EntryQualification	0.036 (5.255)***	0.035 (5.187)***	0.035 (5.215)***	0.036 (5.302)***	0.035 (5.167)***
Age	-0.155 (-3.406)***	-0.153 (-3.336)***	-0.157 (-3.436)***	-0.157 (-3.459)***	-0.155 (-3.391)***
Gender	0.096 (0.642)	0.122 (0.796)	0.083 (0.549)	0.086 (0.571)	0.091 (0.602)
Language	0.004 (0.023)	0.008 (0.053)	0.036 (0.224)	0.040 (0.249)	0.040 (0.025)
General maths		-0.106 (-0.811)			
Maths			0.152 (1.005)	0.171 (1.162)	
Econ			0.079 (0.568)		0.110 (0.809)
R ²	0.204	0.209	0.215	0.213	0.209

Table 3: Overall Performance and Core Business Subjects

Model	I	II	III	IV	V
Constant	3.575 (3.493)***	5.987 (4.403)***	6.663 (4.856)***	6.156 (4.405)***	3.120 (3.222)***
EntryQualification	0.023 (3.509)***	0.036 (5.249)***	0.036 (5.295)***	0.036 (5.262)***	0.026 (4.468)***
Age	-0.112 (-2.687)***	-0.168 (-2.949)***	-0.192 (-3.435)***	-0.174 (-3.019)***	-0.102 (-2.572)**
Gender	0.091 (0.670)	0.099 (0.656)	0.108 (0.717)	0.106 (0.699)	-0.003 (-0.012)
Language	-0.051 (-0.357)	-0.002 (-0.013)	-0.007 (-0.047)	0.008 (0.053)	0.010 (0.076)
Accounting Information for Managers	0.032 (5.355)***				
Business Academic Skills		-0.060 (-0.376)			
Marketing Principles			-0.185 (-1.128)		
Principles of Economics				-0.089 (-0.536)	
Statistics for Business					0.030 (6.826)***
R ²	0.358	0.205	0.213	0.206	0.427

Table 4: Overall Performance (GPA) and T-tests

Model	Entry Qualification		Ages	
	High	Low	Mature	Young
Mean	4.742	4.235	4.282	4.564
Difference (T-statistic)		0.507 (23.409)***		-0.282 (-2.314)**

Table 5: Overall Performance (GPA) and T-tests

Model	Accounting Information for Managers		Statistics for Business	
	High	Low	High	Low
Mean	4.860	4.045	4.864	4.028
Difference (T-statistic)		0.815 (18.578)***		0.836 (22.387)***