Comparing university academic performances of HSC students at the three art-based faculties

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University Malaya enrols students from all states in Malaysia as well as a small number of students from overseas. The objective of this paper is to investigate the effect of past performance on students at three faculties, namely, Faculty of Economics and Administration(FEA), Faculty of Business and Accounting(FBA) and Faculty of Arts and Social Sciences(FASS). Students' prior achievements include their entry scores or points in English language proficiency and mathematics at the Malaysian Certificate of Education (MCE) level. Other factors taken into consideration are gender of students and their ethnic origins. Research results show that entry points are an important factor in influencing students' achievement in all three faculties. Apart from this, female students are found to have better results than their male counterparts in FBA and FASS. It was also found that mathematics performance at the MCE level is one of the influential factors for academic achievement in FBA.

Academic performance, prior achievement, entry points, language proficiency, mathematics performance

INTRODUCTION

All states in Malaysia have the same education system and ways of measuring achievement and presenting results at the end of secondary school. Lower secondary education lasts three years. Students take a national public examination at the end of this level after which students proceed to a two-year upper secondary education program. At this level, students can either choose one of the three streams of studies: academic, technical or vocational. At the end of upper secondary education, students take another national public examination known as the Malaysian Certificate of Education (MCE). Upon completing upper secondary education, there are several routes to higher education in the country. One of them is a two-year sixth form education program, where students take a centralised examination known as the Malaysian Higher School Certificate (HSC). An alternative route is a pre-university or matriculation program. There are other routes to local universities but those two routes mentioned above are the most common ones. Each route has a separate education system, with different curricula, different approaches to teaching and different ways of measuring achievement and presenting results. Like the sixth form education, the pre-university or matriculation education program also have centralised examinations.

This paper investigates examine the university academic performance of students from sixth form education in the Faculty of Economics and Administration (FEA), Faculty of Arts and Social Sciences (FASS) and Faculty of Business and Accountancy (FBA) at the University of Malaya, Kuala Lumpur, Malaysia, by examining their prior achievement (university academic entry points,

grades in MCE Mathematics and MCE English), gender and ethnicity. These faculties are assumed to receive students from similar academic backgrounds.

ACADEMIC ACHIEVEMENT

According to Walberg (1984) and Fraser (1987), factors influencing academic achievement can be grouped into three categories. They are student aptitude, instruction and environment. This study is limited by the range of available data and therefore only examines the effect of prior achievement and socio-demographic variables on academic performance in the university examinations. The instructional factors, such as the quantity and quality of education, and the environmental variables such as home environment, university or classroom environment, peer group environment, outside university environment and mass media environment are not investigated.

Academic performance is measured using the Cumulative Grade Point Average (CGPA). Other characteristics and educational outcomes such as leadership, exposure, creativity and motivation are not considered in this study. It is important not to compare directly the CGPA of students from one faculty to another, as this only tells whether the students from one faculty are 'better' or 'worse' than the students from the other. In actual fact, it is a result of different curricula, different approaches of teaching and different ways of measuring achievement. This makes comparisons between faculties difficult. However, comparisons are carried out according to different background characteristics of the students and also different levels of preparedness for tertiary education of the students in each faculty.

Age of students is not taken into account because almost all students are from mainstream post-high school entry and hence none of the students can be considered as mature-aged students. Furthermore a few studies (Archer et al., 1999; Hayes et al., 1997) found older students perform at a level equal to younger students.

Although Leong et al (1990), in his study of performance of students in three major Malaysian public examinations found that students from urban schools performed better than those from rural schools, studies (Jahara, 2001; Tho, 1994, 1999) carried out in the universities did not find urban-rural status to be a significant factors influencing university performance. Hence these two variables are not included in this study.

On the other hand, ethnicity may play a role in influencing the academic performance in these faculties. In 2001, the Malaysian Prime Minister released the information Malay students were lower, in terms of academic performance when compared to their non-Malay counterparts (*The Sunday Star*, Nation, July 29, 2001, p.2).

The three faculties selected are preferred by the *Bumiputera* (Malays and native people). According to Chew et al (1995), *Bumiputera* students are more inclined to study humanities, social and behavioural science, and commerce and business studies.

Another socio-demographic variable considered in the study is gender. One of the local newspapers (*Berita Harian,* 18 July 2002, p.10) claimed that more than 70 per cent of the students enrolled in the public universities in the academic year of 2000/2001 are female. It was also stated that female students not only perform better at the primary and secondary school examinations but in the university level as well. This was said to be due to a number of factors such as female students were more responsible, serious and showed a higher level of commitment to their studies than did male students.

Apart from the socio-demographic variables, prior academic achievement is also considered as one of the predictors of academic achievement. Though there are many factors that influence academic performance of students, prior academic achievement is taken as a very important

selection criterion at various levels of education in Malaysia. The main determinant for admission to the local public universities is based on university entry points. The entry points can be divided into two sections: points for co-curriculum activities and points for academic achievement. In this study consideration is only given to points for academic achievement to represent prior academic achievement. In addition, the quota system also influenced the admission of students to the university. The quota system has been implemented since 1970s under the New Economic Policy to obtain a better balance in enrolment in the local universities among various ethnic groups. This has resulted in a gradual increase in *Bumiputera* students in local universities.

In this article, the investigation considers the influence of prior English proficiencies and mathematical abilities on academic performance at the university level. Nagaraj and Lee (1992) found that previous mathematical ability was an important factor contributing to academic success in the Faculty of Economics and Administration. This current study, however, only takes into consideration MCE mathematics since only at this level, is mathematics a compulsory subject. English is also an important subject and is included as one of the factors in this study since most of the reference works and textbooks at the university level are written in English. Students with high proficiency in English can be expected to perform better because of this advantage.

ABOUT THE DATA

Students who were registered in the academic year of 2000/2001 in the three faculties were chosen for this study. The CGPA at the end of the second semester of 2000/2001, ethnic group and gender for all students were obtained from the Centre of Information Technology, University of Malaya. Nonetheless, prior achievements such as university entry points, English proficiency and mathematical ability in the MCE examination, were collected manually from the data held in the University of Malaya Admission and Record Section. The university entry points which consisted of academic and co-curriculum points, had a total of 100 points. The maximum points for academic and co-curriculum were 90 and 10 points, respectively. Only academic entry points were taken into consideration in this study.

Since this study only takes into consideration HSC school leavers, then it is appropriate to examine their numbers against the total number of students enrolled in these three faculties. More than 90 per cent of students from FEA and FASS were HSC school leavers. On the other hand, more than half (52 per cent) of students from FBA were from matriculation program, diploma and other courses. Furthermore, since the data on prior academic performance were collected manually from the Admission and Record Section, some of the information was not complete. However, it was possible to collect information on more than 90 per cent of the total students enrolled and under consideration in this study.

Table 1 gives a summary of characteristics of the students enrolled in the second semester of the academic year 2000/2001. More than two-thirds of the students were female. Ethnic origins are divided into two groups: 1 = Malays, 0 = Others/Non-Malays. Among the three faculties, FASS has the largest percentage of Malays (slightly more than half), compared with less than one-third in FEA and FBA. It is expected that better grades in MCE mathematics and MCE English lead to better performance in these faculties. The grades for these two subjects range from 1 to 9 with 1 as the highest grade and 9 as the lowest. These grades are regrouped into two: 1 to 3 as 'excellent performance' and 4 to 9 as 'not excellent performance'. From the table below, most of the students performed very well in MCE mathematics especially students from FBA, where more than 80 per cent of the students obtain grades 1 to 3. However, less than 50 per cent of students from FASS are in this category. Although the percentages of students who do well in MCE English are not as high as that in mathematics, the highest percentage is still from FBA.

Table 1: Characteristics of Students

Variable	Faculty of Economics and Administration	Faculty of Business and Accountancy	Faculty of Arts and Social Sciences
Gender			
Male (%)	31.4	28.4	26.2
Female (%)	68.6	71.6	73.8
Total	204	261	875
Ethnicity			
Malays (%)	37.7	20.7	51.2
Others (%)	62.3	79.3	48.8
Total	204	261	875
Prior Mathematics Performance			
Excellent (%)	58.8	80.8	41.3
Not Excellent (%)	41.2	19.2	58.7
Total	194	260	813
Prior English Performance			
Excellent (%)	35.8	49.6	23.5
Not Excellent (%)	64.2	50.4	76.5
Total	151	258	671

PRIOR AND CURRENT ACADEMIC ACHIEVEMENT

As mentioned above, the CGPAs of students cannot be compared directly from one faculty to another. However, it is still interesting to see the distribution of CGPA across faculties. From Figure 1, it can be seen that the highest and the lowest values of CGPA for FEA and FBA are similar but the box is higher for FBA, indicating that more students in FBA have high CGPA points, when compared to students from FEA. From the figure, it is also evident that the spread of points are different for the three faculties. The CGPAs for students in FBA are wide but for students from FASS, their CGPAs are relatively constant. It is also possible to observe that there are a few outliers in FASS. However, for the purpose of our analysis, these cases are still included.
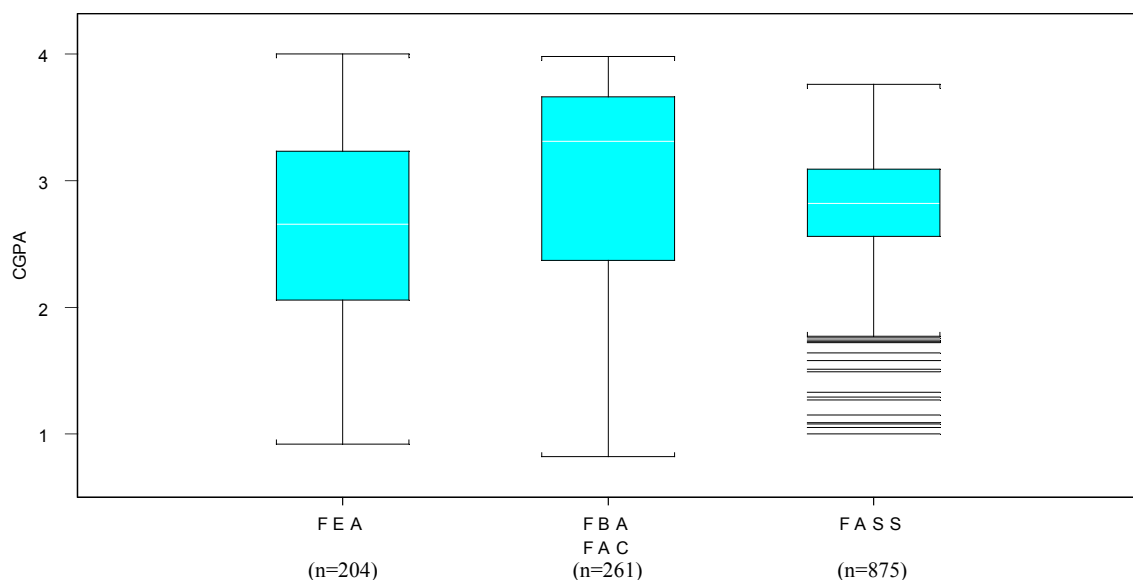

Figure 1. Box-plots for CGPA of students in the three faculties

Examining in greater detail the correlations of the university academic entry points and CGPA, the value of the correlation coefficients are 0.82, 0.82 and 0.26 for FEA, FBA and FASS, respectively. All of the correlation coefficients are significantly different from zero at the 5 per cent level of significance. Although the value of correlation coefficient for FASS is small,

indicating that the relationship is weak. The scatter plots, shown in Figure 2, suggest that students who perform well at the pre-university level will also perform well at the university.
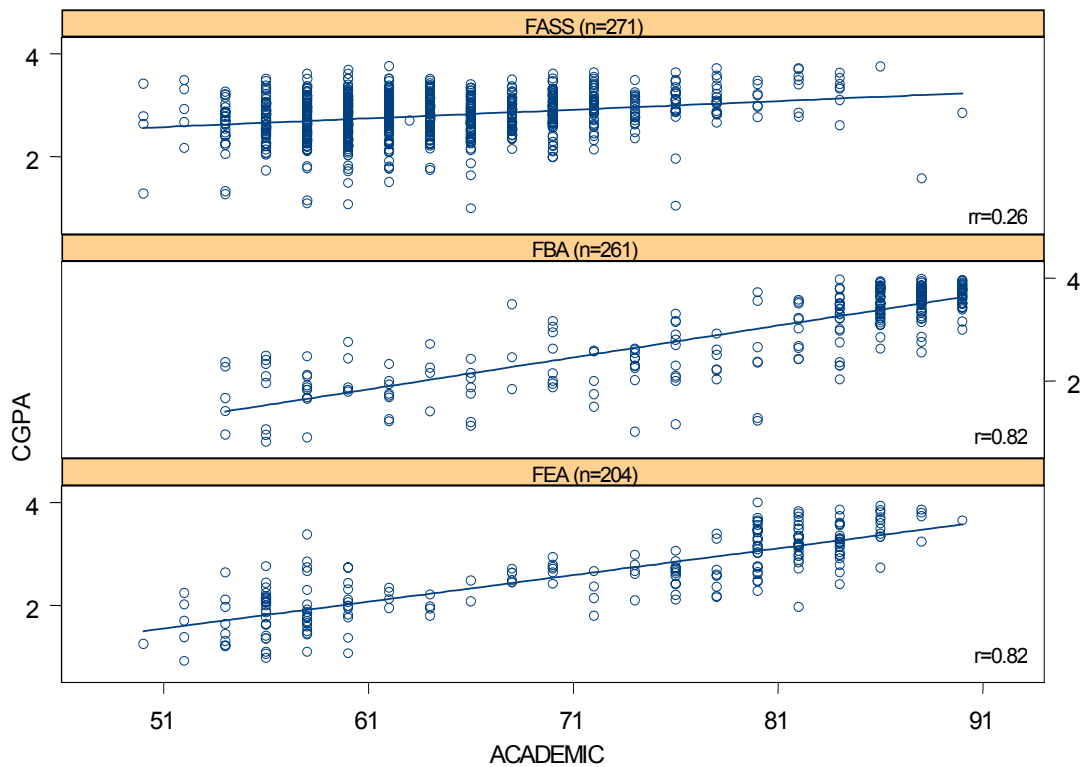

Figure 2. Scatter Plots of Academic Entry Points versus CGPA

Figure 3 shows that there are considerable differences in the entry standard among Malays and non-Malay students in FEA and FBA. This also results in obvious differences in academic success between them. The entry points and the academic performance of Malay students are significantly lower than their non-Malay counterparts. This finding agrees with a similar study by Yahaya et al (2001) on the academic performance of FEA students in the 1998 and 1999 cohort. They found that the academic performance of the Malay students was significantly lower than the Indians and the Chinese. In contrast, although this figure suggests that the differential in entry points and academic performance among the ethnic group is not so obvious for students in FASS, there are recognisable differences in the entry points and academic performance between the ethnic groups.

It is also of interest to analyse student entry points and academic performance by gender. Although the differential in entry points and academic performance for female and male students are not as great as is shown in Figure 4, the figure also indicates that females perform better than their male counterparts. However, the use of significance tests on the data recorded in Figures 3 and 4 are not meaningful since there are likely to be interaction effects between gender and ethnic groups, and academic performance.

REGRESSION ANALYSIS

In this study, we examine five meaningful and potential predictors for explaining academic performance. The regression function has CGPA as the dependent variable. The independent variables are students' academic entry points (ACADEMIC), prior Mathematics performance (MATH, 1 = excellent, 0 = otherwise) and prior English performance (ENG, 1 = excellent, 0 = otherwise), gender (GENDER, 1 = male, 0 = female), ethnicity (MALAY, 1 = Malay, 0 = others). Except for ACADEMIC, other independent variables are binary.
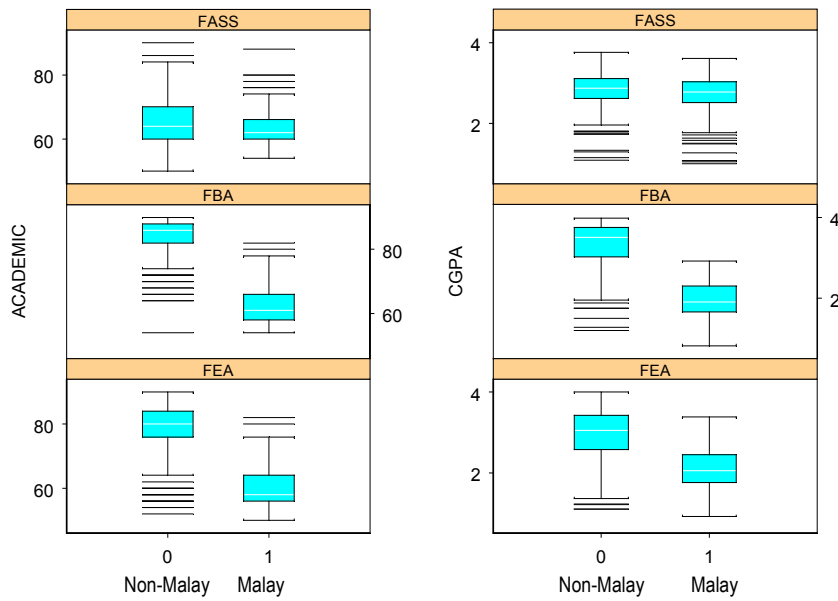
Figure 3. Box-plots for entry points and academic performance according to ethnic groups
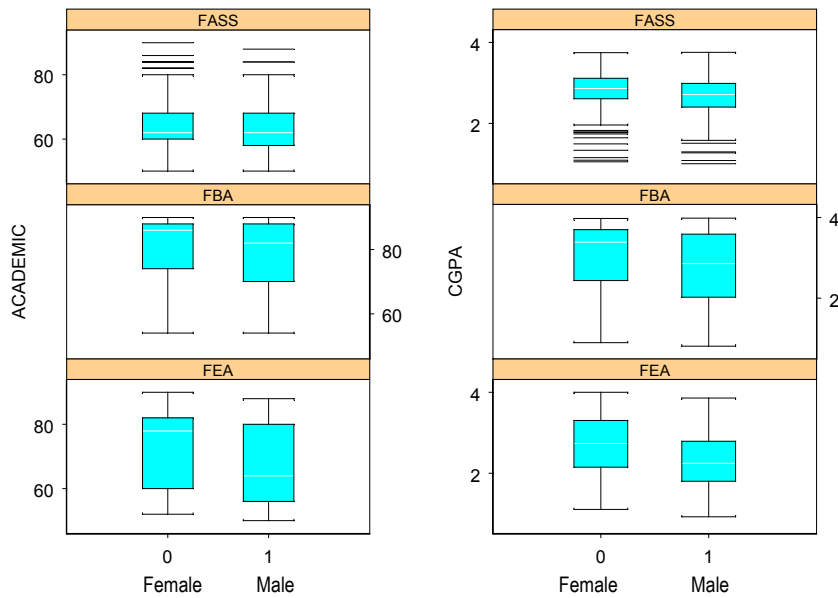

Figure 4. Box-plots for entry points and academic performance according to ethnic groups

Using the multiple linear regression analysis and applying the two potentially competing principles of Best Fit and Parsimony in the data analysis, we find the following results in which only statistically significant effects are recorded.

Model 1: Faculty of Economics and Administration
$$CGPA = -1.09 + 0.05 ACADEMIC \hspace{4cm} \text{Equation (1)}$$
$$\text{Adjusted R-squared} = 0.61$$

Model 2: Faculty of Business and Accountancy
$$CGPA = -1.38 + 0.05 ACADEMIC - 0.17 GENDER + 0.45 MATH \hspace{1cm} \text{Equation (2)}$$
$$\text{Adjusted R-squared} = 0.71$$

Model 3: Faculty of Arts and Social Sciences
$$CGPA = 1.81 + 0.02 ACADEMIC - 0.15 GENDER \hspace{3cm} \text{Equation (3)}$$
$$\text{Adjusted R-squared} = 0.10$$

The regression equations (1), (2) and (3) indicate that, the student performances in the FEA, FBA and FASS are very much depended on the pre-university qualification.

In FEA, the only significant factor is the entry points (ACADEMIC) and the additional four other factors are not significant. ACADEMIC alone explains around 61 per cent of the variance in CGPA in this study. The coefficient of ACADEMIC is positive, indicating that students who perform well in the pre-university qualification also do well in the first year university examination. In the FASS data both ACADEMIC and GENDER are important factors in influencing the academic performance of FASS students. The coefficient of GENDER is negative, indicating that female students perform better than their male counterparts are ACADEMIC points are taken into accounts. The variance explained in the performance of the FASS students is quiet low, around 10 per cent, indicating that other factors related to instruction and environment, that are not considered in this study may have influenced performance. Alternatively, the grading of performance at the university level in this field may be low reliability, thus reducing the explanatory power of the analysis.

For FBA students, ACADEMIC, GENDER and MATH play important roles in influencing CGPA. The coefficient of ACADEMIC and MATH are positive, suggesting that students who perform well during HSC and do well in Mathematics subject during MCE also perform well at the university. The negative coefficient for GENDER indicates that female students again perform better than male counterparts. These three variables explain around 71 per cent of the variation in CGPA.

CONCLUSION

This study finds that the prior achievement in HSC is a reasonable good predictor to first year university performance, for all the three faculties investigated. Besides prior achievement, gender plays an important role in influencing success in the university at least in two faculties, Faculty of Business and Accountancy and Faculty of Arts and Social Sciences. Generally, female students outperformed male students. This can also be due to high prior academic ability among them as compared to the male students. Good ability in Mathematics also helps to influence success in academic performance for students in the Faculty of Business and Accountancy but not for students from the other two faculties. Unlike Faculty of Economics and Administration and Faculty of Business and Accountancy, factors considered in this study have a very low explanatory effect on the academic performance in the Faculty of Arts and Social Sciences. This study also suggests that the problem of differences in academic performance across ethnic groups and gender may operate prior to the university level.

REFERENCES

Archer, J., Cantwell, R. and Bourke, S. (1999) Coping at university: an examination achievement, motivation, self-regulation, confidence, and method of entry. *Higher Education Research and Development*, 18(1), 31 − 54.

Fraser, B. J., Walberg, H. J., Welch, W. W. and Hattie, J. A. (1987) Syntheses of educational productivity research. *International Journal of Educational Research*, 11, 145 − 252.

Hayes, K., King, E. and Richardson, J. (1997) Mature students in higher education: III. Approaches to studying in access students. *Studies in Higher Education*, 22(1), 19 − 31.

Leong, Y. C., Cheong, S. Y., Chew, S. B., Salim, S., Marimuthu, T., Talib, A. A., Rashid, A. R. and Chew, S. M. (1990) Factors influencing the academic achievement of students in Malaysian school. Report prepared for the Ministry of Education, in conjuction with the 8th World Bank Loan, Government of Malaysia.

Nagaraj, S. and Lee K. H. (1992) The determinants of academic performance: A comparison of three cohorts at the Faculty of Economics and Administration, University of Malaya. *Malaysian Journal of Economic Studies*, 29 (2), 47 – 61.

Tho, L. M. (1994) Some evidence on the determinants of student performance in the University of Malaya introductory accounting course. *Accounting Education*, 3(4), 331 – 340.

Tho, L. M. (1999) Predicting success in university accounting examination performance. *Journal of Educational Research*, 20, 95 – 104.

Walberg, H. J. (1984) Improving the productivity of America's schools. *Educational Leadership*, 41(8), 19 – 27.

Yahaya, J., Tey, N. P. and Liaw, S. H. (2001) Chasing the Grades – Academic Performance of First-Year FEA Students. *FEA Research Update*, 1 (2), 2 – 6.

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