CHAPTER 2

METHODOLOGY

2.1 BACKGROUND OF THE COLLEGE AND SAMPLING DESIGNS

2.1.1 The Private College Under Study

This study was conducted in a private college, located in Subang Jaya, Malaysia. Subang Jaya is the most densely populated township in Selangor, and is located about 20 kilometer from the heart of Kuala Lumpur, the national capital. The population of Subang Jaya comprises mainly of middle and upper middle-classes. Subang Jaya has quite a large number of private colleges. Students from all over Malaysia and other countries come here to pursue their studies. The private colleges offer several types of courses, ranging from oversea pre-university programmmes to tertiary degree courses.

The private college selected for this study is one of the most well-established and largest private colleges in the country. It has a good reputation for producing high performers. The college offers a comprehensive range of internationally recognized courses. It has the largest pre-university center with four programmes, namely the Cambridge 'A' Level (CAL), the South Australian Matriculation (SAM), the Canadian Pre-University (CPU) and Business Foundation (TUBF). It also offers quality tertiary courses, namely the University Technology of Sydney Twinning Programme (UTS), British Degree Programme (BDP) and American Degree Programme (ADP).

The two most popular and well-known pre-university programmes in this college are the Cambridge 'A' Level (CAL) and South Australian Matriculation (SAM). Students enrolled in the Cambridge 'A' Level programme in the college are required to sit for an examination conducted by the University of Cambridge Local Examination Syndicate upon completing the course in 18 months. The CAL is recognized as an entry requirement into undergraduate's degree courses in universities, polytechnics and colleges worldwide, particularly in United Kingdom. It is widely accepted as entry requirement to institutions of higher learning in Singapore, the United States, Canada, Australia, New Zealand and India.

Since the college started the Cambridge 'A' Level programme in 1991, it has grown into one of the largest centers in this country. Over the years, it has registered a pass rate of over 90% in the Cambridge 'A' Level examinations. The college also has an enviable track record of producing excellent results by winning several prestigious University of Cambridge Local Examinations Syndicate (UCLES) subject awards that are awarded by the Cambridge Examination Board to the most outstanding candidates in each of the four subjects – Mathematics, Science, Business Studies and English. Students of this college have won two awards in 1996 (Mathematics and Business Studies), three awards in 1997 (Mathematics, Business Studies and English) and three awards in 1998 (Mathematics, English and Science) respectively.

In the 1999 June Cambridge 'A' Level examination, a total of 17 students scored perfect 5 'A's (4 core subjects plus General Paper). A further 25 students scored 4 'A's

and 48 students scored 3 'A's. More than 50% of the students scored at least one 'A'. Many of these students went on to prestigious universities such as Cambridge, Oxford, Imperial College, LSE, Yale and Cornell for further studies.

The South Australian Matriculation programme (SAM) has been offered by the college since 1969 and it is the largest in the world outside of Australia. It is a one-year course and the Senior Assessment Board of South Australia issues the South Australian Certificate of Education (SACE) to students upon successful completion of the programme. Most of the graduates proceed to Australia to further their studies, and a sizeable number also went on to universities in the United Kingdom, New Zealand, Canada, the United States and India.

In 1999, 84.1% of the SAM students were awarded the SACE (South Australian Certificate of Education), and 40.2% of them obtained average score of 80% and above. The excellent results reinforce the leading position of the college as a highly respected institution of higher learning in the country.

In 1999, the size of the student population in the Subang Jaya campus was approximately 2,700. The Cambridge 'A' Level (CAL) comprised the highest proportion (40.7%), followed by South Australian Matriculation (SAM, 29.6%), American Degree Programme (ADP, 9.3%), University Technology of Sydney (UTS, 9.3%), Canadian Pre-University (CPU, 8.1%) and Business Foundation (TUBF, 3%). The British Degree Programme (BDP) was conducted in a different campus.

2.1.2 The Sampling Design

A stratified single-stage cluster sampling design was used in the sample selection for this study. Samples were selected from various programmes, which form the strata. The distribution of the students, number of classes and approximate class size by programme is shown in Table 2.1. Under simple random sampling, the required sample size to achieve a bound of error of 0.04 for estimating the proportion (assuming the maximum variance scenario of 0.5^2) is about 674 students, and this is about a quarter of the student population in the college. Using proportionate sampling, about a quarter of the students from each programme were selected. The classes for each programme were selected based on systematic sampling with probability proportional to size, yielding a self-weighting design. The number of classes selected and estimated sample size for each programme is shown in Table 2.2.

Table 2.1: Distribution of students, classes and approximate class size by programme

Programme	Student population		Number of classes	Number of students per class
	Number	%		
Cambridge 'A' Level (CAL)	1100	40.7	48	< 30
South Australia Matriculation (SAM)	800	29.6	32	< 30
Canadian Pre-University (CPU)	220	8.1	8	< 35
Business Foundation (TUBF)	80	3.0	4	< 25
American Degree Programme (ADP)	250	9.3	10	< 30
University Technology of Sydney (UTS)	250	9.3	10	< 30
Total	2700	100.00		

Table 2.2: Number of classes selected and estimated sample size by programme

Programme	Estimated sample size	Number of classes selected
Cambridge 'A' Level (CAL)	275	10
South Australia Matriculation (SAM)	200	7
Canadian Pre-University (CPU)	55	2
Business Foundation (TUBF)	20	1
American Degree Programme (ADP)	62	3
University Technology of Sydney (UTS)	62	3
Total	674	26

The survey was carried out towards the end of the semester in 1998, when students had just finished their examination. Some of the students did not come to the class and this resulted in under-coverage of the intended sample. The actual number of students who attempted the questionnaires is shown in Table 2.3.

Table 2.3: Actual number of classes covered in the survey and the number of students who completed the questionnaires by programme

Programme	Actual no of classes selected	Actual sample size	%
Cambridge 'A' Level (CAL)	10	270	43.6
South Australia Matriculation (SAM)	7	170	27.4
Canadian Pre-University (CPU)	1	30	4.8
Business Foundation (TUBF)	1	20	3.2
American Degree Programme (ADP)	3	75	12.1
University Technology of Sydney (UTS)	2	55	8.9
Total	24	620	100

2.2 DATA COLLECTION

The main survey was built on an exploratory survey covering 249 students in mid 1998 as part of the course on Survey Techniques and Sampling Designs of the Master of Applied Statistics Programme. The questionnaire was designed to capture information pertaining to student's background, academic achievement, knowledge and use of computer skills, social interaction and attitude towards life.

In the exploratory survey, the questionnaires were distributed to the students at the end of the class. The students were briefed on the objectives of the survey and how to fill up the questionnaire. While this method of data collection is faster and cheaper than face-to-face personal interviews or other methods of data collection, the survey showed that a rather high proportion of the questions were not answered, especially the open-ended questions.

Based on feedback from the exploratory survey, some of the questions were refined or rephrased to make them clearer so as to improve the response rate in the follow-up survey. The revised questionnaire was then used for the survey two months later. Group administration method was again being used. Overall, there was marked improvement in the response rate as compared to the exploratory survey. The improvement in the response rate was also due to the fact that the number of students per group was smaller and thus students could get help easily from the teachers in charge who had been briefed on the questionnaire.

2.3 DATA PROCESSING & EVALUATION

The completed questionnaires were checked manually to detect inconsistencies. The respondent's current residence and the mode of transportation to college showed inconsistency in a number of cases (e.g. staying in Penang and walking to college). Another inconsistency detected was parent's educational level and their respective occupation (primary education and working as a bank officer). Some of the errors were rectified based on other information provided by the students. There were only 569 copies of the questionnaires completed with necessary and important information were used in the analysis. However, information for some of the items was not available, and this resulted in varying sample size across variables. For instance, information on place of origin was not available for 23 cases, and as such the analysis would be restricted to only 546 respondents.

2.3.1 CONSTRUCTION OF VARIABLES

Most of the pre-university students gained admission to the college with their SPM examination results[1]. Their SPM aggregate will be used as independent variable in ascertaining the extent to which college performance is related to secondary school performance. However, about 10% of the students had enrolled in the college by using the Cambridge 'O' Level examination results[2]. Their 'O' level examination grades are computed and treated as the equivalence of SPM aggregate.

Computation of Cambridge 'O' Level grade:

'O' Level grade	Score
A	1.5
B	3.5
C	5.5
D	7.5
E	9

Students from Cambridge 'A' Level programme take either three or four core subjects in the examination. Every subject taken by the students in the Cambridge 'A' Level examination was awarded with grades 'A, B, C, D, E, O or F' where grade 'F' is failure.

Following the SPM system in computing the aggregate results, each grade in the 'A' Level programme was given a score as shown below:

Grade	A	B	C	D	E	O	F
Score	1	2	3	4	5	6	7

SAM students take five or six subjects in the examination. Each subject is graded from 'A' to 'E' where 'E' is regarded as failure. Each grade will be given a score as shown below:

Grade	A	B	C	D	E
Score	1	2	3	4	5

Both the mean scores of 'A' Level and SAM examination results were used as the measurement of the academic performance at pre-university level.

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[1]Sijil Pelajaran Malaysia (SPM) examination is a public examination based on the Malaysian Educational System, sat by the students upon completing the secondary school education.

[2]Cambridge 'O' Level examination is a public examination based on the British Educational System, sat by students upon completing the high school education.

2.4 STATISTICAL TECHNIQUES USED IN THE ANALYSES

The SPSS statistical package will be used in data analysis. The Excel programme will be used in presenting the data in graphical forms. To have an overview of the data distribution, frequency tables and means will be presented. Besides, the stem and leaf diagrams and box plots will also be presented.

In order to determine the direction and magnitude of relationship between the dependent variable (academic performance) and the independent variables (student's background and behavioral factors), cross tabulations and chi-square tests will be carried out.

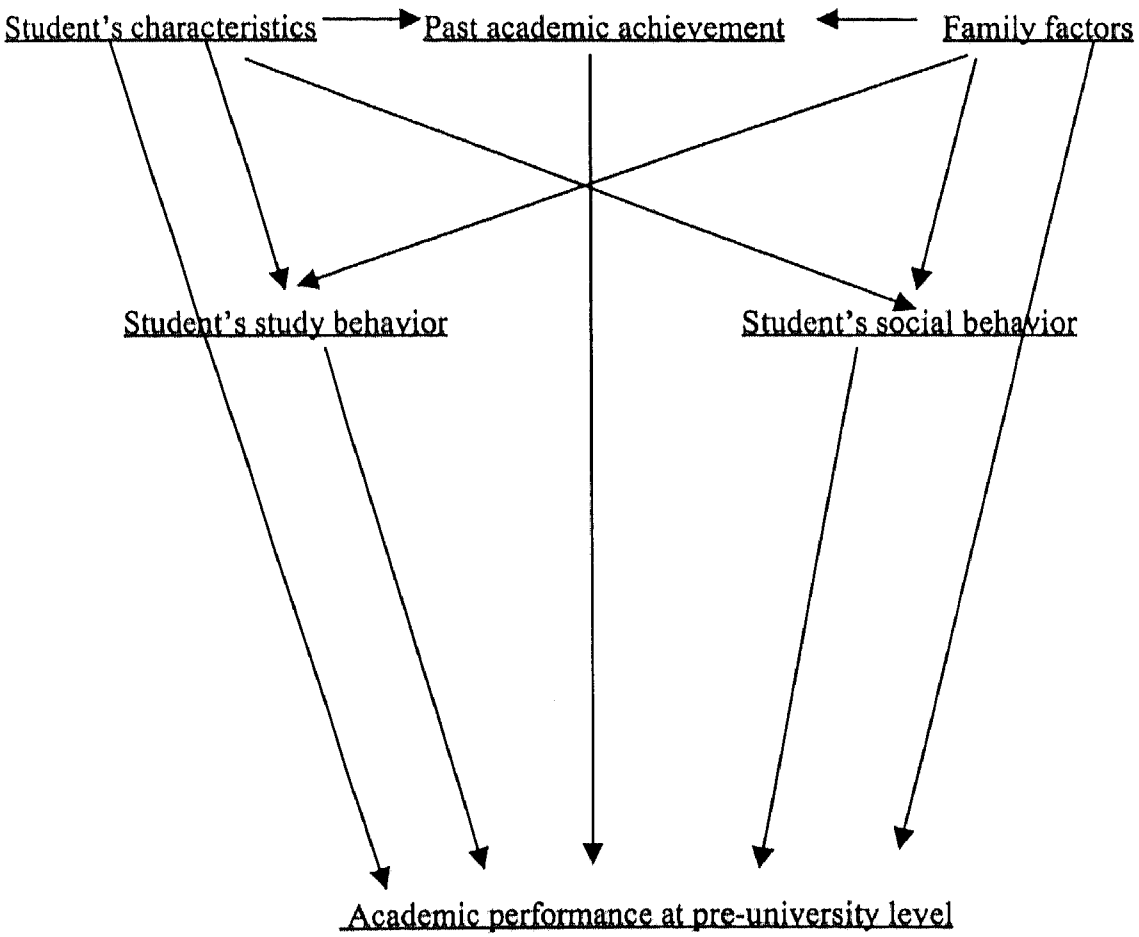
Within the multivariate context, Multiple Classification Analyses will be used to examine the net effects of selected variables. Variables will be ranked according to their beta values, which measures the relative weight of the independent variables. This statistical technique allows one to measure the explanatory power of a set of independent variables.

2.5 ANALYTICAL FRAMEWORK

This study attempts to investigate the relationship between student's characteristics and background variables, as well as their study and social behaviors, with academic performance. The conceptual framework of this study is presented in Figure 2.1.

Figure 2.1

The conceptual framework of the study



The variables which have been identified as having an influence on student's academic performance and relevant information, are shown in Table 2.4.

Table 2.4: Selected independent variables and question number in questionnaire

Construct	Variables	Question number in questionnaire
1)Student's characteristics and background		
a)Student's demographic characteristics	-Age, gender, ethnicity, place of origin.	Section A, question 1-4
b)Family factors	-Parent's educational background. -family size, birth order.	Section A, question 14-15 Section A, question 10
c)Student's educational background	-SPM aggregate. -Stream and medium of instruction used at former school.	Section B, question 3 Section B, question 1-2
2)Student's behavior		
a)Study behavior	-Number of hours spent on self-study -Taking tuition -Join study group -Perception of workload -Perception of usefulness of the course	Section B, question 19 Section B, question 7 Section B, question 18 Section B, question 10 Section B, question 11
b) Social behavior	-Number of times of outing per week -Boy/girl friend	Section D, question 7 Section D, question 8

The testable hypotheses that provide guidance for this study are formulated as follow:

Hypothesis 1:

Pre-university academic performance varies a great deal according to student's demographic characteristics such as age, gender, ethnicity and place of origin.

Hypothesis 2:

The home and socio-economic background variables, based on parent's educational level, family size and birth order, have significant effects on student's academic performance.

Hypothesis 3:

Pre-university academic performance correlates strongly with student's educational background such as previous academic achievement, stream and medium of instruction at former school.

Hypothesis 4:

Pre-university academic performance is significantly related to the student's study behavior construct variable, based on the number of hours spent for self-study, and participation in study group or tuition group, and perception of workload or usefulness of the course.

Hypothesis 5:

Pre-university academic achievement is significantly related to student's social behavior, in terms of number of outing per week and whether having steady boy or girl friend.

2.6 LIMITATIONS OF THE RESEARCH

In this survey, the sample respondents are rather homogeneous with respect to some of the socio-economic characteristics, and it is not reflective of the national population. For instance, as many as 98% of the college's students had come from urban areas. Thus, I was unable to capture the differences that may exist between urban students and rural students. From past data, there is big gap in the academic performance between these two groups of students. In the seventh Malaysia Plan, it was reported that in 1995, only 3.5% to 5.1% of the rural students who sat for Pure Science subjects achieved excellent grades compared with 9% to 12% for urban students.[3]

The composition of the students in the sample does not reflect the actual composition of the Malaysian population. Chinese students make up 83% of the college population, compared to only 2% of Malays and 11% of Indians. This is very different from the national population distribution of about 6:3:1 for the Malay, Chinese and Indian respectively. This poses as a limitation to examining the effect of the ethnic factor in determining the academic performance.

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[3] Malaysia, 1996, Seventh Malaysia Plan (1996-2000), Percetakan Nasional Malaysia Berhad, K.L., p.105-129.