THE UNIVERSITY OF HULL

FACTORS RELATING TO ACHIEVEMENT OF HIGH SCHOOL STUDENTS IN KUCHING CITY, MALAYSIA

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ABSTRACT

This study aims to contribute towards a greater understanding of high-school-student learning, with a view to determining remedial action to be taken to upgrade academic achievement, improving learning and teaching strategies and environment, and assisting in national curriculum development.

The research was of a non-experimental *ex post facto* survey type, following techniques such as those of Entwistle-Kozeki, Rotter and Carver-Scheier, and using a specially designed demographic questionnaire.

The sample studied consisted of 925 seventeen-year-old lower-sixth-formers in the eight high schools of Kuching City, Sarawak, Malaysia, differentiated according to a number of criteria: science vs. arts streams, rural vs. urban origin, day scholars vs. boarders, boys vs. girls, and the six major ethnic groups.

The data were analysed using *t*-tests, stepwise regression and correlation-statistical techniques to establish what correlation could be found between the educational achievements (SPM results) of the pupils in those groupings and the learning approaches, learning styles, school motivation and psychological attitudes (e.g. optimism, locus of control).

It was found that there were considerable correlations between predictors and the overall achievement in each of the classification groups. However, the best predictors of achievement varied significantly from group to group.

Achievement in individual subjects of the curriculum was also studied in relation to aspects of the teaching-learning environment, student attitudes and demographic factors. This too provided evidence of significant correlation between achievement and certain factors for each disipline, but a wide range of variation between the predictors for achievement in different disciplines.

On the basis of conclusions drawn from the analysis of the data, recommendations are made for remedial actions and strategic planning to be undertaken to improve students' achievement and enhance the institutional teaching-learning environment. Scope for further research comprising longitudinal studies, wider samples, and different methodologies is indicated, which could lead to a better understanding of high-school students' learning in this developing third-world country.

GLOSSARY OF ACRONYMS

SMK - Sekolah Menengah Kerajaan
[Government Secondary School]

SMBK - Sekolah Menengah Bantuan Kerajaan
[Government-Aided Secondary School]

SPM - Sijil Pelajaran Malaysia
[Malaysia Certificate of Education]

SPVM - Sijil Pelajaran Vokasional Malaysia
[Malaysia Vocational Certificate of Education]

SRP - Sijil Rendah Pelajaran
[Lower Certificate of Education]

STPM - Sijil Tinggi Persekolahan Malaysia
[Malaysia High School Certificate]

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CHAPTER I

INTRODUCTION

1.0 Introduction

> Our first wish is that all men should be educated fully to full humanity; not only one individual, nor a few, nor even many, but all men together and single, young and old, rich and poor, of high and lowly birth, men and women in a word, all whose fate it is to be born human beings; so that at the last the whole of human race may become educated, man of all ages, all conditions, both sexes and all nations. Our second wish is that every man should be wholly educated, rightly formed not only in one single matter or in a few or even in many, but in all things which perfect human nature...
>
> (Comenius, J.A.,1650).

Since the first experimental investigation of human learning was conducted by the German scientist Hermann Ebbinghaus in 1885 (Hilgard, 1975), numerous research that can be classified as investigations of learning continues at an accelerating pace and has expanded in a number of directions - attempting to educate 'the whole of human race for the perfection of human nature'.

Educational psychology, a branch of psychology concerning with human learning and development in educational setting, involves scientific study of techniques that can be used to enhance learning. The discipline in educational psychology has also expanded rapidly varying with theories of learning, leaving each generation of teachers to be faced with a similar range of fundamental problems of how to expedite and enhance learning to enable the learner to be self-sufficient.

Entwistle (1985) argued that the methods of teaching being used in schools reflect mainly traditional beliefs about how pupils learn and what objectives are most important at different age levels. But according to him, these methods have been influenced to some extent by certain prominent psychological theorists and their interpreters (or misinterpreters). Entwistle further claimed that the past learning theories have captured an aspect of human learning of continuing importance, but none of them has given an adequate description of learning in everyday life in the classroom.

Child (1985), in reviewing the new direction of educational psychology, argued that the past theories described learning and intellectual development, but few theories existed for assisting learning and intellectual development. He suggested that the time had come to step out on the plank and make some speculations about the future contribution of psychology to education. In anticipating the future of the psychology of learning and teaching, Entwistle (1985) suggested that the developing interactionist theories are more likely to be of direct use to the educators. He stated:

> Children's learning will be seen as depending on the particular learning milieu, the teacher's interactions and ways of teaching, and the pupil's capabilities, motivations and personality - all interacting together to explain different outcomes of learning.
> (Entwistle, 1985:8).

The conceptualization of contrasting approaches to learning became possible through the work of Marton and Saljo (1976a, 1976b, 1984); Pask (1976b) and Biggs (1978). In one of the earliest research reviews of literature concerning different student's approaches to learning, Marton and Saljo (1976a, b) identified two different approaches or "levels of processing", which they called the 'surface approach' and 'deep approach' to learning. They argued that students' approaches to learning would depend on the context, the content and the demands of the learning tasks.

Enwistle and his colleagues (Entwistle & Wilson, 1977; Entwistle et al., 1979; Ramsden & Entwistle, 1981) who were very much influenced by Marton's model, developed the so called " Approaches to Studying Inventory (ASI)" which incorporated a variety of constructs from research into individual differences in student learning. Besides broadening Marton's two main categories, Enwistle and his associates introduced a third one - a 'strategic approach' to learning. The final version of the ASI consisted of 64 items in 16 subscales, and these in turn were grouped under four general orientations to studying. The distinction between 'deep' and 'surface' approaches to learning was subsumed within a broader dichotomy between a 'meaning orientation' and a 'reproducing orientation', and supplemented by two further dimensions of 'achieving orientation' and 'styles and pathologies' (Richardson, 1990). The results of various investigations in a five-year research programme at the University of Lancaster, as

reported by Entwistle and Ramsden (1983) have aroused widespread interest as they offered to teachers the possibility of illuminating the complex learning process operating in higher education, and acting significantly on them.

In 1988, Entwistle and Kozeki developed and published the School and School Work Inventory, which has opened up a new era for future research in exploring the association between perceived contextual factors, students' approaches and styles to learning and school motivation in day-to-day classroom settings. The inventory brought together the concepts describing school motivation, extracted from Kozeki's "School Motivation Inventory" in Hungary, with the research on learning styles and approaches which was already available from the Lancaster's "Approaches to Studying Inventory". The new scale called "School and School Work Inventory" offered to teachers and students of higher learning the conceptualizations of school motivation in relation to approaches and styles to learning.

The conclusions, that they reached in their major study concerning the association between learning context, approaches to learning and school motivation, were far-reaching and potentially of great value - indeed, such research would be one of the most beneficial areas for the improvement of teaching and learning in higher education (Ramsden, 1979; Laurillard, 1979; Ramsden & Entwistle, 1981, 1983; Entwistle and Kozeki, 1985, 1988; Meyer & Parsons, 1989).

The present study was undertaken using the "School and School Work Inventory" administered to Malaysian students studying in the final years of secondary school - Lower Sixth Form in Kuching City. This study attempts to examine the relationships between school motivation (parental and teachers' encouragement and the influence of peer within the group), learning approaches and learning styles and to explore the extent to which these predictor variables, together with other personality variables, such as locus of control and optimism, contribute to students' academic achievement in the Sijil Pelajaran Malaysia (SPM) external examination.

It is perhaps useful to provide an overview of the study. The study has attempted to provide in this Chapter I, the following: Introduction; Malaysia in brief; Education in Malaysia; Background to research issues; Research problems; Operational definitions; Rationale behind selecting the predicted factors; Specific problems; Significance of the study; Objectives and limitation of the study.

Chapter II provides a review of related literature concerning theories of learning, locus of control and views of optimism-pessimism. It also reviews some of the major studies on approaches and styles to learning, school motivation and individual demographic variables.

Research methodology is discussed in Chapter III. This includes research procedures (strategies) employed in this

study, method of measurement, organization of the research instruments and administration of the main study, and selection of the samples. Details of the pilot study and the statistical analysis of the items to check the reliability of the selected instruments will also be discussed in this chapter.

Data analysis and findings of the main study are presented in Chapter IV. The researcher will devote this chapter to his analyses - testing the main null hypotheses.

Finally, Chapter V will summarized the significant findings of the study and provide conclusions and recommendations for further research with particular reference to the educational field in Sarawak and more generally to Malaysia as a whole.

In order to understand the problem in its proper prespective, we will trace the development of education in Malaysia and Sarawak in particular, in the foregoing section. The researcher was very much aware that we must, first of all, know briefly the Malaysian geographical and historical backgrounds before studying the development of education in the country in order to appreciate how this development or underdevelopment came about.

1.1 Malaysia in brief

Malaysia is a young and rapid developing country situated in the Southeast Asia, just north of the equator. Malaysia as a federation dates from 1963. At its inception, the Federation of Malaysia comprised Peninsular Malaysia (formerly known as Malaya, with eleven constituent states that formed **Persekutuan Tanah Melayu** or Federated Malay States in 1948), Singapore, Sabah and Sarawak. By an agreement signed in August 1965, Singapore ceased to be a part of Malaysia and became an independent republic. As it now stands, therefore, Malaysia is made up of Peninsular Malaysia which is the southermost tip of mainland Asia and the states of Sabah and Sarawak in the north-western Borneo island. The two regions covering an area of about 330,434 square kilometres are separated by about 540 kilometres of the South China Sea.

The federation of Malaysia is made up of thirteen states, namely Perlis, Kedah, Pulau Pinang, Kelantan, Terengganu, Pahang, Perak, Selangor, Negeri Sembilan, Melaka, Johor, Sabah and Sarawak (see Appendix 1A). The Malaysian society is multi-racial in character. Each ethnic group has its own cultural and social heritage which gives the country a diverse quality. The **Bumiputera** ('sons of the soil' or indigenous peoples), including principally the Malays and in Sabah and Sarawak, the Kadazan, Bajau, Murut,

Iban, Melanau, Bidayuh, and the groups of Dayak and Orang Ulu - account for 60 percent of the population, Chinese for 30.9 percent and Indians for 8.4 percent. According to the 1985 census, the population of Malaysia was about 15.8 millions with 82.1 percent or 12,968,800 living in Peninsular Malaysia; 8.1 percent or 1,279,500 living in Sabah and 9.8 percent or 1,542,800 living in Sarawak (Government of Malaysia, 1986: 128).

According to Azizah (1987), this plural society is of relatively recent origin. The British economic interests were responsible for the creation of a plural society in Malaysia. Over a century ago the overwhelming majority of the population in Malaya were Malays, but by the first decade of the twentieth century the Malays had been reduced to only 55 percent of the population, with Chinese and Indians forming 35 percent and 10 percent, respectively. The development of tin and rubber industries, two commodities which commanded a ready market in Europe and America, necessitated recruiting large numbers of labourers and the British administration turned to China and India for a large-scale supply of cheap labour. The situation in China, especially in the south-eastern part, was that they had very limited resources with poor farming yield as well as little land available for farming and severe population pressure. This gave the British an easy task to attract labour from China. Large numbers of Chinese emigrated to

Malaya in search of a better livelihood in the tin mines and it was not until the recession of the 1930s that the British administration started to enforce restrictions. The Indians, on the other hand, were recruited to provide cheap labour for the rubber plantations and in the construction of roads and railways. Many of the Indians coming to Malaya came under an 'assisted scheme' where their passages were paid by their prospective employers or the Indian Immigration Committee. Thus, these trends resulted in Malaysia becoming the multi-racial society it is today.

> The present multi-racial character of the country is the direct result of British economy policy before the war which encouraged mass non-Malay immigration. The Chinese and Indian immigrants, during that time, were regarded as transient workers and their flow into the country, and departure, fluctuated with Malaya's economic fortunes. However, they became settled communities in the country by the fourth decade of this century. Malaya's vast economic potential and the liberal, tolerant attitude of the Malays, exploited by the colonial government, caused an influx of Chinese and Indian immigrants, and mass immigration continued until the thirties.
> (National Operation Council, 1969:1).

In view of these deep-rooted cultural and religious differences, social integration of the three ethnic groups seemed to be out of the question. The situation was aptly summarised by Ness (1967) as:

> They are brought together at the market place through common interests, and there they can be found in communication in the bazaar Malay [language] that has become the lingua franca of Malaya. However in their occupational specialization, in their widely different languages and style of life, and their religious

> differences, one can see the power of the forces that separate them.
>
> (Ness, 1967 :39)

Sarawak, my area of study, is geographically the largest state in the federation of Malaysia with 124,450 square kilometres, nearly the size of the total land area of the eleven states of Peninsular Malaysia. But in term of population density, according to the 1985 census (Government of Malaysia, 1986), Sarawak is very sparsely populated with only 12 persons per square kilometre. While it has a romantic and unique character of its own, the variegated texture of its land is typical of tropical 'third world countries'. It is a land of green jungle and muddy rivers with poor road communication. It is developing towards growing cities and towns, expanding roadways and changing communities.

Sarawak is governed from the state capital in Kuching and administratively it is divided into 'Divisions'. The nine Divisions respectively have their headquarters in Kuching, Bandar Sri Aman, Sibu, Miri, Limbang, Sarikei, Kapit, Kota Samarahan and Bintulu (see Appendix 1B). Within each Division, there is a number of Districts. Each Division is under the administration of a Resident who is assisted by a District Officer in each of the Districts. Under the District Officer is a number of Sarawak Administrative Officers (S.A.O) who manage the day to day

affairs within the District and the sub-Districts (Evelyne Hong, 1987).

Sarawak's population was more than 1.6 million at the time of the 1988 census, having grown at a rate of 2.7 percent per annum during the past decade (DSMS, 1988).In Sarawak, 70.1 percent of the population were **bumiputera** or the indigenous people which can be conveniently divided into three major groups with distinct ethno-geographical boundaries (MISS, 1983):

i) the Malay-Melanau groups comprising predominantly Muslim coastal dwellers, though some Melanaus are still Pagan or Christian. The other coastal ethnic groups are the Kedayan and the Belait in the Fourth and Fifth Divisions, who, apart from fishing, are paddy-field planters; the Selakau of Lundu and Sematan in the First Division and the Sebuyau and Balau of the First Division coastal district. These groups live in individual houses in Malay-style villages known as **kampung**.

ii) the Dayaks such as the Ibans and Bidayuh are mostly non-Muslim indigenous groups. They are typically long-house dwellers, shifting (itinerant) cultivators and they form the main lowland groups. Other minority lowland groups

include the Kenyah (including Sabup and Sipeng), Kayan, Bisaya, Sians, Baketans and Ukits.

iii) the Kelabit-Murut groups are the upland groups. They are better known as 'Orang Ulu' or 'the people of the upper reaches of rivers'. The Kelabit group consists of Apo Duat, Kajang, Sekapan, Kejaman, Lahanan, Punan, Tanjong and Kanowit (Hong, 1987; Rousseau, 1988). The Murut and the Kelabit groups are well-known for their wet terrace cultivation of paddy fields. One jungle dwelling group is the nomadic Penan, living in the interior highlands of thick rain forest of the Fourth and Fifth Divisions.

The Chinese are **bukan bumiputra** (non-indigenous) or the immigrant group. The Chinese settlement in Sarawak has increased within the last hundred and thirty years mainly since the time the first White Rajah arrived in Sarawak in 1839. Before that the number of Chinese residing here was negligible. It was not until the 1850s that the Chinese migration was considerable, attracted by the possibilities in commerce and the development of gold and antimony mines in the Bau region. The present number of Chinese forms a significant proportion of the population of Sarawak, 28.7 percent in the 1985 census. The Chinese are concentrated mainly in the First Division, the Sibu-Sarikei-Bintangor

region of the lower Rajang (Third and Sixth Divisions) and in the Fourth Division. They are basically involved in businesses in urban areas but large numbers are also engaged in agriculture.

Other immigrant groups form a very small percentage of the population, around 2.0 percent (MISS, 1988). They comprise mainly **Orang Jawa** or Javanese from Indonesia and Indian businessmen from India.

Kuching, Sarawak's capital city is an urban area. According to the Department of Statistics in Kuching 1980, urban areas refer to those towns with populations of 10,000 and above. The growth of the urban population in Sarawak has gradually risen being 12.5 percent in 1960, 15.3 percent in 1970, 17.6 percent in 1980 and 19.2 percent in 1985 (Government of Malaysia, 1986). As stated by the Department of Statistics Kuala Lumpur, the urban population of Sarawak in 1980 was 227,682 (MISS, 1983) and eight years later, Heidi Munan (1988) proclaimed that Kuching City alone had reach 300,000 inhabitants. The increasing rate of urbanisation has been due to the growth of small rural settlements into larger urban settlements as well as the influx of rural population into existing urban settlements or rural-urban migration. With this rural-urban migration process going on now, it is believed that Kuching, a cosmopolitan centre, has all the mentioned-ethnic groups of

Sarawak. Regarding the rural-urban migration, the Prime Minister of Malaysia Datuk Seri Dr. Mahathir Muhammad stated that:

> Rural-urban migration cannot be avoided because it comes with development. Citing the United States as an example, 95 percent population lived in towns today compared with five percent 200 years ago, indicating that a high urban population signifies the level of development and progressiveness of the country.
>
> (*New Straits Times*, dated 18.8.1989).

1.2 Education In Malaysia

The earliest form of education in Malaysia, in all areas of Peninsular Malaysia, Sarawak or Sabah, was the Quran school. In the pre-colonial period, education had been closely associated with religion and instruction in the Quran. It was the only 'formal' education that the vast majority of Muslim children, from Malay families in Malaya, Malays and Melanaus in Sarawak and Bruneis and Bajaus in Sabah had availables. Classes were usually conducted in the surau (a building used for general religious purposes) or in **sekolah pondok** (sekolah means 'school', **pondok** means 'hut' or 'shanty', thus it refers to the building in which the pupils lived while studying). The pupils in these **sekolah pondok** were taught in Malay in addition to the principal Islamic prayers which more read and written in Arabic from the Quran. To this day, the

concept of **sekolah pondok** is still associated with the teaching of the Quran and Islamic religion.

It was the custom among the Muslim parents to send their children to these Quran schools when their children were approaching **baligh** or puberty. Their parents would hand their children over to a Quran teacher or **ustaz**, usually with the following short speech:

> Imam, we have a favour to ask of your kindness. Here is our child... we desire to place him in your hands so that he may be taught to read the word of God.
> (R.J. Wilkinson, 1925 :13)

According to Awang Had Salleh (1979 :2):

> The parents of these children require that they shall first learn the Quran. Once they have mastered it, they can proceed with the Malay language. The **guru** (teacher) Quran are men of real learning in the Hukum Syarak (Syarak Law), live exemplary lives according to Muhammadan standards, and are regarded with general respect.

James Brooke, the first White Rajah of Sarawak, in his report said that he was surprised on his first meeting with Pengiran Mahkota- the Malay leader, in 1839 that:

> His education has been more attended to than others of his rank. He both reads and writes his own language and is well acquainted with the government laws and customs of Borneo.
> (Sarawak Education Department, 1987 :8)

James Brooke was impressed by Pengiran Mahkota. He proclaimed this Malay leader as a very intelligent man,

great thinker, debater, politician and poet. Unfortunately, there is dearth of literature on education in Sarawak during the pre-colonial time.

Education During the Colonial Period (1786-1941)

The education that emerged in Malaya during the colonial period can be classified into two systems: vernacular education and English education. The vernacular education was represented by the Malay Vernacular Schools, the Chinese Vernacular Schools and the Indian Vernacular Schools. It was the British policy at that time that vernacular schools were mainly built in the rural areas and the English schools, which were using English as the medium of instruction, were found in the urban areas- a concentration of immigrant groups. In addition to that, several of the English schools were managed by missionaries and, thus, posed a further barrier to the Muslim Malays.

The English School System

The setting up of English schools in Malaya was much earlier than vernacular schools. The British (the East India Company)who came to Malaya, the North Borneo Chartered Company who came to Sabah and the Brooke Family who came to Sarawak were there basically to establish

business ventures. At first they did not devote much attention to formal education. This task was left to the Christian missionaries and the local communities themselves. The first recorded Roman Catholic Mission school in Malaya was established by Portuguese Jesuits in Malacca in 1548 (Wong and Ee, 1975 :21). The first English school was thought to have been started in Singapore in 1815 by the London Missionary Society. Since then more such schools were built by the society before they left the Straits Settlements for China in 1847. Among these schools which are still functioning to this date are St. Francis Xavier, St.Pauls, St.Joseph, St. Augustine, St. Thomas, St.John, Victoria Institution, French Convent, Convent of Holy Infant Jesus, King Edward in Peninsular Malaysia and many more in Sabah and Sarawak.

The English schools during the British period could be classified under two types - the 'Free' schools which were founded by local effort with funds raised locally and enjoyed the patronage and support of the Government, and the Grant-in- Aid English schools established by missionary societies with a certain amount of government aid.

The first free school was the Penang Free School established in 1816. According to Cullin and Zehnder (1903), the only form of educational facility was the services of the schoolmaster Thomas Cullin, for the

children of European and Government officials. It was not until 1891, when a new schoolmaster with a Master of Arts qualification was appointed, that the school made progress towards giving secondary education as provided to the present day. In 1826, another free school was established in Malacca called the Malacca Free School. Later in 1893, the first major English school was established in Selangor, called the Victoria Institution of Kuala Lumpur.

By 1920, English education had become entrenched as a major influence in the Federated Malay States. According to Abu Zahari (1977), the British Administration did not share the enthusiasm of the local population for English education. These English schools were established only in the developed urbanised belt where the Chinese and Indian immigrants congregated. Requests and appeals for the establishment of English schools in the rural districts where Malays were the majority, were either rejected or discouraged. A major section of the Malay population had no access to the English schools, in spite of the government policy of making English education as an important criterion for entry into government services and having attractive salaries (Loh, 1975 :20). In fact the Malays were bound by law to send their children to the Malay school. It was not until after the late 1930s that provision was made for Malay boys to gain admission into

the English school through a system of selection by examination, after they had completed four years of Malay primary education. Those selected were admitted into the Special Malay Class for two years after which they were promoted to Primary IV or the fourth grade of the primary English school. This provision, however, opened the door to English education only to a very small minority of the Malay children due to the fact that the majority of them did not begin in the Malay school immediately at the age of seven and by the time they completed the four years plus the two years in the so called 'Special Malay Class', they had passed the maximum age allowed for entry to the primary section of the English school. As mentioned earlier, English schools were only found in towns. As such, Chinese and Indian children resident in the towns formed the bulk of English schools' enrolment. As the bulk of the Malays lived in rural areas, they were virtually excluded from this English education which was recognized as having much more economic value compared to vernacular education. Malay schools remained giving education at the primary level, while the English, Chinese and Tamils schools moved progressively towards giving secondary education. This trend went on until Malaya achieved its independence in 1957.

In the case of Sarawak, it had been governed as a private colony by an English family, the Brooke from 1841

to 1941. Before James Brooke came to Sarawak in 1839, Sarawak was under the Sultan of Brunei. Pengiran Mahkota was sent by the Sultanas 'governor' to Sarawak. In 1841 James Brooke proclaimed himself **raja/rajah** (or king), called the 'White Rajah' on offering 'protection' for Pengiran Mahkota against some tribal chiefs who were portrayed 'pirates' by Western historians. Among the anti-British tribe chiefs who led rebellions against Brooke were Rentap- Iban chief from Sadok Mountain in the Batang Lupar; Linggir, an Iban chief from Saribas; Sharif Mashor and Haji Abdul Ghapor- Malay chiefs from Matu-Daro and Temenggong Koh- the Orang Ulu chief from Baram. All attempts to overthrow the White Rajah met with failure and, thus, piece by piece, land went into the Rajah's territory which expanded to form the present Sarawak.

Although there are very few documents available regarding education during the time of James Brooke, the Rajah did mention his policy to open up mission schools in Sarawak "...as a means of elevating the Borneo people from their primitive jungle life..." (Seymour, 1967 :7).

The first Anglican school in Sarawak, started by Reverend F.T. Mac Dougall and Reverend Wright in 1848, was named 'Kuching Mission School' but its name was later changed to 'St.Thomas' school. St.Joseph's school of Kuching, built in 1883 was the first Roman Catholic school

in the State. These two English-medium mission schools in Kuching, St.Thomas' School (under Anglican Church of England) and St.Joseph's School (Roman Catholic) had become popular institutions with the Dayaks and the Chinese, and were also later attracting some Malays because of the growing importance of the English language. At that time, in which almost similar circumstances held in all of Malaya, all clerkships in government departments required young people to be proficient in English (Reece, 1982).

The Catholic and Anglican missionaries, shunned by the Muslim population in the urban areas, later focused their attention on the animists and the pagans in the interior parts of Sarawak. They concentrated mostly on the Dayaks and the Kelabit-Murut groups. In 1855 they built mission schools in Banting, Lingga and Lundu and, in the same year, St.John's School was opened in Merdang, Kuap. In 1863, Reverend Crossland started another mission school called St.Luke' School in between the two rivers- Sungai Undop and Batang Lupar in Sri Aman. Reverend Perham also started a mission school in Sebatan in the district of Krian, Saribas in 1876 but was forced to close down because of poor enrolment (Seymour, 1967).

Regarding Sabah history, the territory was divided into two governing powers until the end of the nineteenth century: the westernpart of Sabah was under under the

Sultan of Brunei and the eastern part belonged to the Sultan of Sulu. In similar circumstances as in Malaya and Sarawak, the western part of Sabah was 'presented' by the Sultan of Brunei to a British trader named Alfred Dent in 1872 in return for seeking British protection. Dent then approached the Sultan of Sulu for the adjacent tract to the east and the Sultan agreed to cede it to him in perpetuity. Dent, on receiving a charter from the British Crown in 1881, thus formed a company to open up the land. This commercial enterprise was called the British 'North Borneo Chartered Company (NBCC)' and named their territory, the present state of Sabah, 'The State of North Borneo'. Presently, there is a dearth of documentation on mission schools in Sabah during this NBCC period. Abdul Kudus Ahmad (1981: 44) cited as:

> The missionaries devoted their attention to the animists, mostly the Dusuns. These schools also attracted almost exclusively the Chinese in the growth centers. This was the head start which made the Christian Chinese and, to a lesser extent, the Christian Dusun dominate the government service and high level manpower in Sabah.

The Malay Vernacular School System

Turning now to the Malay schools, the educational system during the British Government's administration will be discussed. Secular Malay education was introduced with the beginnings of British rule in Malaya. It was a gradual process and it started with the Straits Settlements and

later spread on to the Malay States.The first such school was set up in Penang in 1821. As noted earlier, the Malays had formal education, which was religious in character, even before they came into contact with the West. Thus, when secular education was introduced by the British in the nineteenth century, the government initially found it convenient to use the buildings in which Quranic/religious lessons were carried out. Malay education was geared persistently to a policy of conservation of the life styles of the Malay peasantry, to the extent that the Malay school curriculum did not develop beyond the provisions for essentially a four-year primary education, with the exception of teacher training as the highest level of post-primary education (Abu Zahari, 1977). The Malay education goals were basic literacy (reading, writing and simple calculations), and essentially those basic skills deemed necessary in rural everyday life (Husin, 1982). According to Loh (1975) these special skills which were taught included wood-carving, ratan making, metal craft and the more exotic arts of Malay medicine, sorcery, letter-writing, warrior skills of fencing, the making of talisman and fine daggers (**kris**) and those occupational skills perceived as appropriate for a fishing or farming community. Awang Had (1979), Azizah (1987) and Ibrahim (1980) have cited several documents (Reports/Minutes/ Speeches) written throughout the British rule in Malaya testifying to the nature and purpose of the education that

was to be given to the Malays. According to Azizah (1987: 129), "for the sake of brevity and simplicity I shall give only the dates of these Reports/Minutes/Speeches rather than the full source, the dates being important to indicate that this 'attitude' was consistently adhered to."

> Vernacular education is the teaching of Malay boys to read and write Malay, Arithmetic, Geography and Romanised Malay. This much education teaches them to be regular,obedient and cleanly.....
> - Annual Reports Straits Settlements 1898 (in Awang Had,1979).

> You can teach your Malays so that they remain in the padi-fields and so that they do not lose their skill and craft in fishing and jungle work. Teach them the dignity of manual labour, so that they do not all become **kerani** (clerks), and I am sure that you will not have the trouble which has arisen in India through over-education.
> -Federal Council 1915 and Winstedt 1917 (in Ibrahim 1980).

> The aim of the Government is not to turn out a few well-educated youths, nor a number of less well-educated boys; rather it is to improve the bulk of people and to make the son of a fisherman or the peasant a more intelligent fisherman or peasant than his father had been, and a man whose education will enable him to understand how his own lot in life fits in with the scheme of life around him."
> -Annual Reports Straits Settlements 1920. (in Ibrahim, 1980).

> Our policy in regard to the Malay peasants is to give them as good an education as can be obtained in their own language. The last thing that we want to do is to take them away from the land. (in Awang Had, 1979)

> The removal of illiteracy and the teaching of elementary agriculture together with clean and healthy methods of living must be the aim and object of all venacular schools. (Winstedt, 1931)

According to **Jabatan Pelajaran Sarawak** (Sarawak Education Department) (1987), the first Malay school in Sarawak was **Sekolah Encik Buyong** built in Kuching in 1851. In 1883, 1900 and 1921 other Malay schools were built in Kuching called **Sekolah Melayu Kampung Jawa, Sekolah Melayu Gersik,** and **Sekolah Merpati Jepang,** respectively. There were very limited numbers of Malay schools built outside Kuching or in rural areas during this period. Among these were schools built in Oya in 1912, in Sadong in 1925 and the first Malay girl-school - **Sekolah Permaisuri,** built in Kuching in 1921. Seymour (1967 p.24) stated that during the Brooke's colonial period (1841 to 1941), there were only 24 Malay schools in 1930 and this number went up to 33 in 1938. Table 1.1 shows the number of Malay schools compared with English and Chinese schools under the Brooke's administration.

TABLE 1.1
Schools Under Brooke's Colony (1841-1941)

TYPE OF SCHOOL	1930	1938
English Schools:		
Anglican Mission Schools	11	13
Roman Catholic Mission Schools	15	27
Seventh Day Adventist (SDA) Mission Schools	1	3
Malay Schools	24	33
Chinese Schools	91	144
Dayak School	1	1

(Adapted from Seymour, 1967 :24)

In Sabah, the first Malay schools established by the North Borneo Chartered Company in 1915 was meant for the sons of native chiefs (Sabah Education Department, 1975). The Malay language was chosen because it was the ***lingua franca*** among the indigenous groups. The schools which were limited to the sons of the chiefs lasted only for a few years and had to be closed down. It was only in 1922 that this Malay vernacular education was on a firmer footing with the help of the Malayan Education Department which sent in curriculum material, text books and four trained teachers. According to Lee (1976), Sabah education was limited to four years and, in line with the Malayan system then, the objective was also to produce an efficient, self-respecting peasantry. Long (1978) proclaimed that the expansion of Malay schools in Sabah then moved very slowly. From 1922 to 1934, there were only 8 Malay schools with an enrolment of 400, as compared to 45 missions schools with 2,150 pupils and 56 Chinese schools with 2,000 pupils.

The Chinese Vernacular School System

Chinese vernacular schools were set up by the Chinese immigrants themselves. According to Wong and Ee (1975: 11), the first known Chinese school was opened in 1815 in Malacca. Before 1900 Chinese schools in this region were carbon copies of schools in China, focussing on the Chinese classical teachings and learning by rote (Purcell,

1936: 224) and "there was nothing 'Malayan' in the curriculum of these schools" (Azizah, 1987: 132). Most of the teachers in these schools were born and educated in China and the text books used were also imported from China, Formusa or Taiwan. These schools provided education at primary levels and between 1911 and 1919 a few primary schools started secondary classes. From here they could further their studies by attending overseas universities in Taiwan and China.

By 1911 when the revolution to overthrow the Manchu Government brought China to civil war, these Chinese schools in Malaya became instruments for the propagation of the political creed of the **Kuomintang**, the Nationalist Party in China. The British government initially accepted no financial responsibility for these schools. However, when activities of these schools became revolutionary and posed a threat to the Government, measures were taken to institute a system of inspection and control over them. Thus, 'The Registration of School Enactment' was passed in the Federated Malay States in 1920 by the British Administration "to give the Education Department legal control over all schools and teachers employed in them, empowered the Director of Education to order the closure of any school which did not comply with the requirements specified for its management, curriculum and sanitary

arrangements." (Loh, 1975: 94). From 1924 onwards modest grants were made towards the cost of running these schools.

The Tamil Vernacular Schools System

Tamil vernacular schools in Malaya began to be set up in the 1870s. These schools, like the Malay and Chinese schools, started in the Straits Settlements and later spread wherever there were estates employing Indian labourers. There were no Tamil school in Sabah and Sarawak from then until today partly because there were no big estates in these states that needed Indian labour. The Indian community was neither interested in the existing Malay schools like the Chinese, nor self-supporting like the Chinese. They were generally more dependent on the estate or the employer for their educational needs. According to Abu Zahari (1977), Tamil education was provided with state funds which included financial aid for Anglo-Tamil Christian missionary schools which used text books and followed a school curriculum from India. Not until 1938 after rubber prices improved following the depression, did the government and rubber plantation firms give some attention to education by increasing grants and providing in-service training for Tamil school teachers to improve these schools. Unfortunately, this change was only short lived as the Federated Malay States and Malaya as a

whole, soon became engulfed in the upheaval of the Second World War.

Japanese Occupation 1942-1945

It was during this period that the four school systems (English, Malay, Chinese and Tamil vernacular schools) which had existed during the British period stopped functioning. This does not mean that there were no educational services at all during that span of time. The schools that continued to exist were compelled to teach only the Japanese language - *Nihon-go*. The Japanese education was to promote the Japanese language as the *lingua franca* and to promote hard-working ethics. The Japanese policy, through its education, was designed to reach out to everyone to inculcate the spirit of "*Dai Toa kyoeiken*" (Greater East Asia Co-Prosperity Sphere) and "*Hakko Ichiu*" (feel an affinity for each other under the Japanese Emperor). According to the Malaysian Ministry of Education (1982: 14), education departments in every state were asked to conduct courses in the Japanese language and to encourage the teaching of *Katakana*, *Hiragana* and *Kanji* writings. *Nihon-go*, which replaced the school system set up by the British, taught subjects such as *Nihon-go*, *taiso*, gymnastics and military training. Teachers were also 'imported' from Japan to teach Japanese language and culture and to instruct local trained teachers at Perak

Nippon-go Kyoshi Yosei-Jo (Perak Teachers' Training Centre) and local administrative officers in these subjects.

The Japanese occupation was short lived - it started in January 1942 and ended in August 1945 - but it had considerable success in whipping up greater anti-British sentiments. When the British regained control in the region under the interim rule of the British Military Administration, they met greater resistance from the Malays who by then had demanded independence. This forced the British to form the so-called 'The Malayan Union' administration in 1946. The Malayan Union set off a storm of protest from the Malays under the leadership of Dato Onn bin Jaafar, President of a political party called the United Malays National Organization (UMNO). This resulted in the Federation of Malaya Agreement of 1948 leading to independence of Malaya in 1957 and later to the formation of Malaysia in 1963.

The Present Education In Malaysia

The Colonialist policy of ' divide and rule' had kept the people of this country in separate compartments for more than a hundred years. In respect to the four British schools systems (1786 - 1941), the National Operations Council (1969) put forward the opinion that these schools

had, however, left a lasting negative effect on the Malaysian society today.

> A striking feature of the Malayan society at that time (before World War II which continues today, slighty abated) was the voluntary cultural segregation - while the Malays lived in a cultural milieu that institutionally continued in a local context, there was no effort made by the colonial authorities to orientate the increasing number of immigrant races towards local institutions. For the most part, the immigrant races were administered independently and led an independent existence. This partly explains some current attitudes among certain sections of the non-Malay communities, and the difficulties experienced today in nation building."
>
> (National Operations Council, 1969: 1)

The Sarawak development plan drawn up immediately following the formation of Malaysia in 1963 saw a tremendous increase in the allocation of development expenditure from 379.7 million ringgits in the First Malaysian Plan (1966-1970) to 3,567.37 million ringgits in the Fourth Malaysian Plan (1981-1985). As education was, also, a Federal subject, the Sarawak Education Department came under the Federal Ministry of Education and was subject to an agreement on education reached between the governments concerned. The Federal Government had increased the allocation of expenditure on education in Sarawak from 45.53 million ringgits to 328.46 million ringgits within twenty years of its initial planning development (Malaysia Information Service Sarawak, 1983). Appendix 1C reveals the centralised nature of the educational system in Malaysia,

where the administration and management of education are organized hierarchically at four levels: the central or ministry level, the state, the district and school levels.

When Sarawak and Sabah joined the already-independent Federation of Malaya to form the Federation of Malaysia on the 16th. September 1963, although education is a federal responsibility in the Malaysian Constitution, they were given the final word as to when the National Education Policy should be implemented in their respective states. Thus, as far as Sarawak was concerned, there was no immediate change in educational policy and administration. The State Education Department continued to be advised by the Boards of Education and Local Education Committees, and English remained the medium of instruction in government and government-aided schools.

Although Education Acts were introduced in Sarawak in 1961 and in 1973 in which the State legislation agreed to a change of medium from English to the national language, the implementation of Bahasa Malaysia as the sole medium of instruction in school in the State was not finalised until 1977. In 1973 the Sarawak Coalition Government took steps to convert all government and government aided primary schools into national primary schools, by making Bahasa Malaysia the main medium of instruction beginning at primary one level. This meant that, by 1982, all government

and government aided English primary schools were fully converted into national primary schools, and, by 1982, all government and government aided English secondary schools up to the Upper Sixth Form were fully converted into national secondary schools using **Bahasa Malaysia** as the main medium of instruction (see Figure 1A). Looking at Appendix 1D and Appendix 1E, which reveal the implementation of **Bahasa Malaysia** (national language) in schools and in external examinations, respectively, in the Peninsular Malaysia, it is noted that Sarawak was left very far behind.

With effect from 1973 the Sarawak Coalition Government took over the administration of primary schools which were under the direct management of local authorities (district councils) since the Crown Colony. The main objective of doing this was to accelerate the development of primary education, particularly in rural areas, both in professional standards and administrative facilities. Thus, all the former local authority primary schools or usually called 'District Council Primary School' were changed to 'Government Primary School' or **Sekolah Rendah Kerajaan.** Since then, the Sarawak Education Department still maintains the term 'government' or '**kerajaan**' for all national schools throughout the State and also refers to them with the term '**kebangsaan**' or 'national' schools as used in Peninsular Malaysia.

FIGURE 1A

The Time Schedule For The Implementation Of Bahasa Malaysia In National Type English Schools In Sarawak

PRIMARY SCHOOL

PRIMARY	1	2	3	4	5	6
1977						
1978						
1979						
1980						
1981						
1982						

SECONDARY SCHOOL

FORM	1	2	3	4	5	L6	U6
1983							
1984							
1985							
1986							
1987							
1988							
1989							

English Medium Bahasa Malaysia Medium

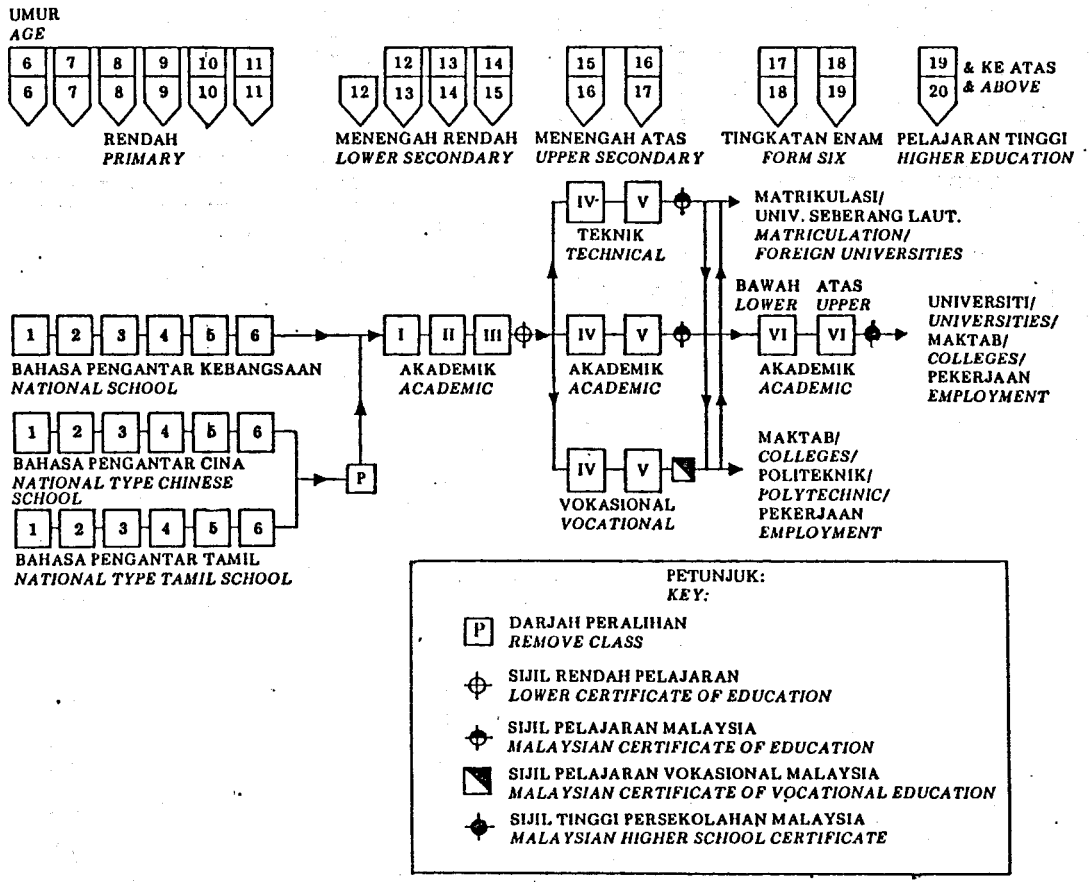
(Source: Ridzuan, "Satu Perbandingan Pencapaian Bahasa Malaysia Murid-murid Bukan Melayu Tingkatan Satu Dengan Murid-murid Melayu Darjah Enam Di Dua Buah Sekolah Di Sarawak" [A Comparative Study of Achievement in Bahasa Malaysia Between Non-Malay Students in Form One and Malay Students in Primary Six in Two Schools in Sarawak], Unpublished B.Ed. Thesis Universiti Pertanian Malaysia, 1985.

In 1982, there were 1,274 primary schools, 103 secondary schools, 3 vocational schools and 3 Teacher Training Colleges throughout Sarawak. Out of 103 secondary schools, 73 had classes up to Form Five and pupils took the **Sijil Pelajaran Malaysia** (Malaysian Certificate of Education) external examination. The other 30 schools were junior secondary schools - having students only up to Form Three where they sat for the **Sijil Rendah Pelajaran** (Lower Certificate of Education) external examination. Other higher learning institutions in the State are branches of the MARA Institute of Technology and the Universiti Pertanian Malaysia (University of Agriculture Malaysia) which offer only diploma courses. The Universiti Pertanian Malaysia is planning for degree courses to be introduced shortly in stages (MISS, 1983).

Before ending this discussion of education in Malaysia, some details should be given of its educational structure. The highly competitive educational structure in Malaysia is in five stages, as shown in Figure 1B and Figure 1C. Figure 1B shows the educational system in Malaysia - the three types of primary school, types of various external examinations and the age of students at different levels, from primary education to higher education. Figure 1C shows the formal educational structure in Malaysia and its comparison to the International Standard Classification of Education - ISCED.

FIGURE 1B

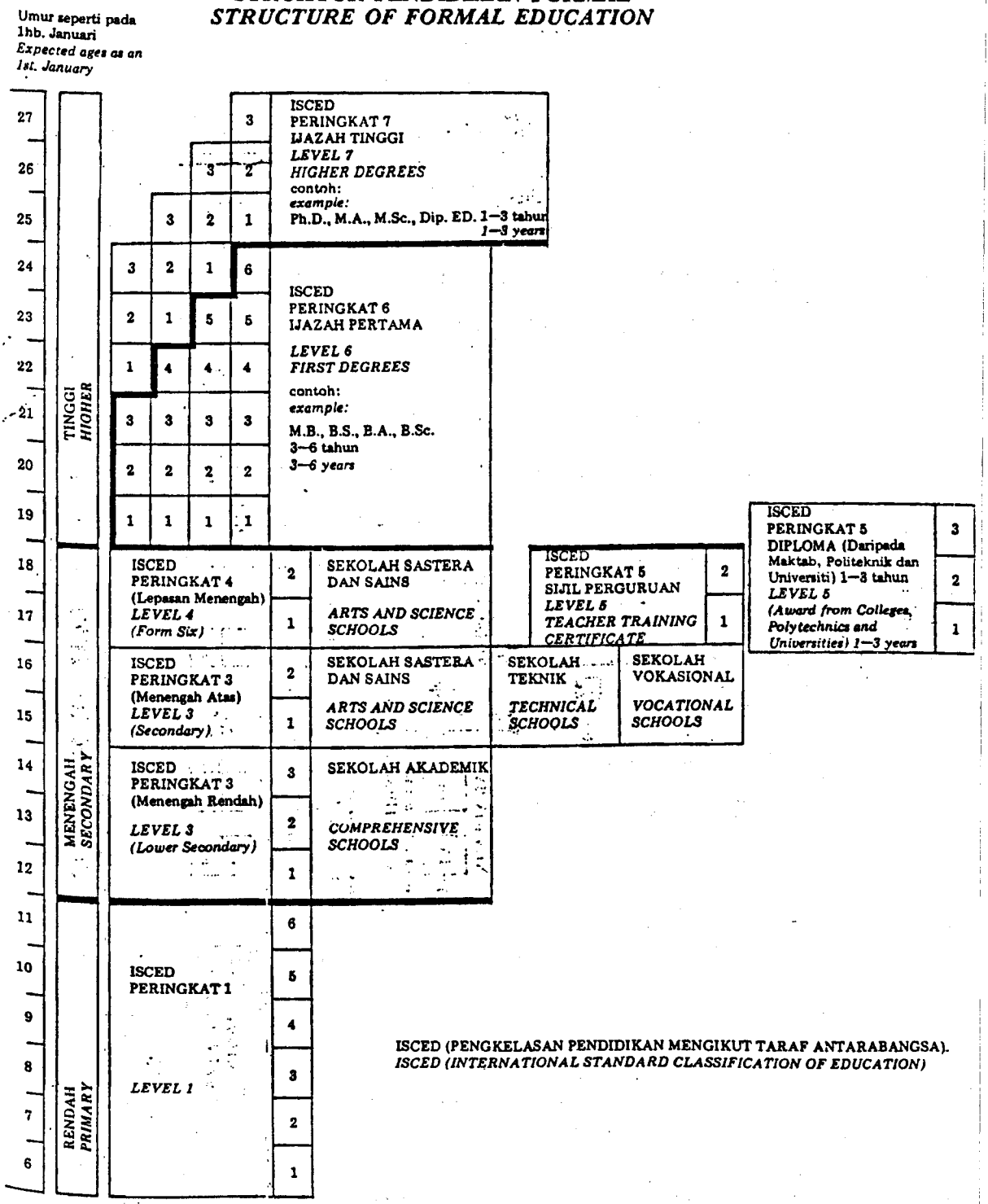
STRUKTUR SISTEM PENDIDIKAN DI MALAYSIA
THE EDUCATION SYSTEM IN MALAYSIA



(Source: Ministry of Education Malaysia (1981), Education In Malaysia, Kuala Lumpur, Dewan Bahasa Dan Pustaka.

FIGURE 1C

STRUKTUR PENDIDIKAN FORMAL
STRUCTURE OF FORMAL EDUCATION



ISCED (PENGKELASAN PENDIDIKAN MENGIKUT TARAF ANTARABANGSA).
ISCED (INTERNATIONAL STANDARD CLASSIFICATION OF EDUCATION)

(Source: Ministry of Education Malaysia (1981), Education In Malaysia, Kuala Lumpur, Dewan Bahasa Dan Pustaka.

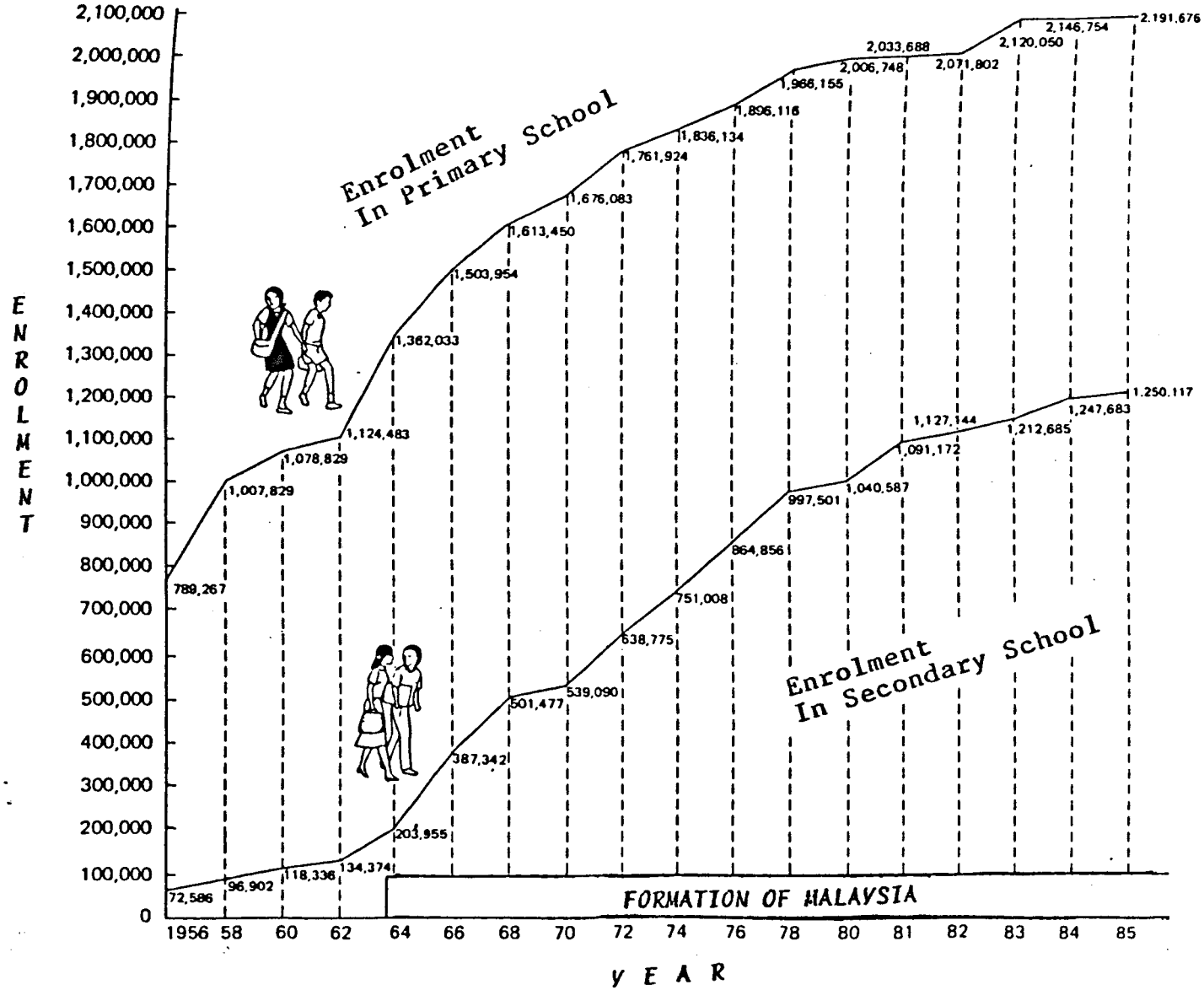
Stage 1: **Primary education**

The basic educational structure consisted of six years of primary school involving free schooling for children between the age of six plus and eleven plus. The system included school teaching in three different media of instruction. In **Sekolah Rendah Kebangsaan** (National Primary School) the medium of instruction is **Bahasa Malaysia**. In **Sekolah Rendah Jenis Kebangsaan Cina (SRJK[C])** or National-Type Chinese Primary School and **Sekolah Rendah Jenis Kebangsaan Tamil (SRJK[T])** or National-Type Tamil Primary School the madium of instruction is still in Chinese and Tamil language, respectively, with **Bahasa Malaysia** as the compulsory subject. In the case of English language, it is still to be taught in all types of school as the second functional language. According to the Government of Malaysia (1986), the enrolment in primary schools is expected to increase from 2 million in 1980 to 2.5 million in 1990. Enrolment increases at primary and secondary levels of education from 1956 to 1985 are shown in Figure 1D. Appendices 1F and 1G reveal the number of primary and secondary schools in Malaysia and their total enrolment from 1980-1989, respectively.

Stage 2: **Lower secondary education**

After completing the sixth year of primary school

FIGURE 1D - ENROLMENT IN PRIMARY AND SECONDARY SCHOOL



(Source: Ministry of Education Malaysia (1989), Education In Malaysia, Kuala Lumpur, Dewan Bahasa Dan Pustaka.

education, the pupils are promoted automatically to lower secondary school (Form I to Form III). Pupils from **Sekolah Rendah Kebangsaan** are admitted straight to Form One whereas pupils from the **SRJK[C]** and **SRJK[T]** are placed in a Remove (Transition) class for a year before entering Form One. The objective of having a remove class is to equip pupils from these two schools with proficiency in Bahasa Malaysia because it is the only medium of instruction from the secondary school levels to higher learning. At the end of Form Three, the pupils sit for an external examination, the **Sijil Rendah Pelajaran (SRP)** or Lower Certificate of Education. Based on these examination results, the pupils are channelled into either an arts or a science stream in an academic school, to a vocational secondary school or technical secondary school depending on their abilities and interests. Those who fail the examination end up as farmers or unskilled labourers in private and government sectors.

Stage 3: **Upper secondary education**

Those who go on to upper academic secondary schools (Form IV to Form V) sit for another external examination - the **Sijil Pelajaran Malaysia (SPM)** or Malaysia Certificate of Education at the end of Form Five; the vocational or technical students sit for the **Sijil Pelajaran Vokasional Malaysia (SPVM)** or Malaysia Vocational Certificate of Education after a two-year course in their specific

studies. These SPM and SPVM certificates are equivalent to Overseas Cambridge School Certificate (Ordinary Level). After this stage students tend to find jobs, join the teachers' training college, polytechnic college, technical college or continue their comprehensive education.

Stage 4: **Post-secondary education**

The period of comprehensive education of the post-secondary school within Form Six takes two years - the Lower and Upper Form Six or within a matriculation class. In Upper Form Six the students are ready to sit for the **Sijil Tinggi Persekolahan Malaysia (STPM)** or Malaysia High School Certificate of Education before proceeding to a university or other institution of higher learning. This **STPM** certificate is equivalent to the Overseas Cambridge School Certificate (Advanced Level).

Stage 5: **Tertiary education**

During the Fourth Malaysian Plan 1981-1985 period, enrolment in tertiary education increased from about 36,800 in 1980 to 69,700 in 1985. In the local institutions, intake into certificate, diploma, and degree level courses increased by 56.6 percent from about 14,300 in 1980 to 22,400 in 1985. Despite dramatic higher education expansion in recent years, there is still a shortage of places in the

seven local universities: University of Malaya, University of Science Malaysia, National University of Malaysia, University of Agriculture Malaysia, University of Technology Malaysia, International Islamic University and Northern University of Malaysia. There are ever-increasing numbers of Malaysian students studying overseas. In 1985, there were about 60,000 students overseas, of which about 49,200 were registered with the Malaysian Students' Departments attached to Malaysian embassies. Of the total, 13,500 were in the United States, 10,300 in Australia, 3,400 in the United Kingdom, 2,700 in Canada, and 1,100 in New Zealand. It was estimated that of the total in 1985, 20,000 were pursuing courses at first degree level. Efforts are gradually being made to reduce the number of students overseas by expanding facilities for higher education in local institutions and in order to shorten overseas stay, pre-university courses, including foreign languages, are offered locally for government-sponsored students intending to study abroad (Government of Malaysia, 1986).

1.3 Background to Research Issue

The coming of independence in Malaysia in 1957 meant that the purpose of education quickly changed in a manner similar to what which had occurred earlier in western countries. The Government of Malaysia sees education as having a number of purposes including nation-building, ethnic harmony, development of an indigenous culture (Ministry of Education, 1970), and the nationalization of attitudes, as well as economic growth (Myrdal, 1968). The first task of the newly-elected government of independent Malaysia was to educate and to unite its multi-ethnic society, as pronounced in the Razak Report

> We believe that the ultimate objective of educational policy in Malaya must be to bring together the children of all races under a national education system.
>
> (Razak Report, 1956:3)

In the concern to unite the multi-ethnic population in Malaysia, education has always been viewed as a powerful force that can contribute towards national unity. The Razak Report on Education of 1956 laid the foundation of the national education system and policy, and this was consolidated by the Rahman Talib Report of 1960. These two reports led to the Education Act of 1961. The National Education Policy, as spelt out in the Education Act 1961, emphasized greater access to education, the implementation in stages of the use of Malay language or **Bahasa Melayu** (and sometimes called **Bahasa Kebangsaan** - national language) as the main medium of instruction, the

establishment of common curriculum, common syllabi and common examinations by all schools within the nation in an effort to promote national integration and unity.

Since achieving independence until the present, it is obvious that Malaysia has been, at all times, concerned with the need to unite its people. Malaysia, being a constitutional monarchy and democratic country, has had its own special goals and objectives to ensure "a just and unified society" based on the RUKUNEGARA, the national ideology which was promulgated after the communal clashes of May 13, 1969. The RUKUNEGARA further specified the role education was to play in the task of nation-building. Within the context of RUKUNEGARA, education is regarded as one of the important strategies towards integrating the multi-ethnic population, 'to unite the various races together so that a united Malaysian nation will evolve' (Ministry of Education, 1970 :50).

In the 1960s, Malaysian educational reform took place at a slower rate than expected and, hence, the **Dasar Pelajaran Baru** (New Education Policy) was introduced in 1970. This new policy provides for the eventual replacement of 'national-type' schools using English as the medium of instruction by 'national' schools using **Bahasa Malaysia (Malaysia language)**. Since then, the term **Bahasa Malaysia** has been used in place of the two previous terms, **Bahasa Melayu** (Malay language) and **Bahasa Kebangsaan** (national language) (Wong and Gwee, 1971). As from 1970, Bahasa Malaysia is the sole medium of instruction in standard one

of all national-type English primary schools and the main medium of instruction in all primary and secondary schools in Peninsular Malaysia by 1980 (Wong and Gwee, 1971), except in national type Chinese and Tamil primary schools where either Chinese or Tamil language is still being used as the medium of instruction but **Bahasa Malaysia** is a compulsory subject. The issue of Chinese and Tamil languages is a sensitive one for the interest of nation-building and unity, and, thus, the Cabinet Committee Report 1979 suggested that: 'In view of the present situation it is recommended that the present school system at the primary level be maintained' (Kementerian Pelajaran Malaysia, 1979: 16).

The Cabinet Committee Report (1979), which reviewed the implementation of the National Education Policy, came up with 173 recommendations, one of which is the **Kurikulum Baru Sekolah Rendah (KBSR) [New Primary School Curriculum]. This KBSR** was implemented in 1982 in class one of all primary schools throughout the nation and by 1988 all classes (primary one to primary six) of primary schools using this new curriculum. In secondary schools, the **Kurikulum Bersepadu Sekolah Menengah (KBSM)** (Secondary School Integrated Curriculum) is currently being implemented, based on Malaysia's philosophy of education which derived from the RUKUNEGARA and the National Education Policy. These new curricula, according to the Government of Malaysia (1990: 23), 'will ensure that the students are not only taught the basic skills in reading, writing and arithmetic but also give emphasis on total

personality development through the introduction of additional subjects on living skills such as business entrepreneurship, home economics, agriculture and family relationship'. It has been, as well, reflected in the Malaysia's philosophy of education in the following statements:

(a) Education caters for the optimum development of individual potentialities (physical, intellectual, moral, emotional, socio-cultural and aesthetic development) to ensure meaningful survival within the framework of societal needs and demands.

(b) At societal level, formal education in Malaysia is viewed as an instrument for achieving national unity and providing manpower with appropriate education and training for national development.

(c) Education is also responsible for the preservation, the development and transmission of national culture and heritage.

(Ministry of Education, 1982:6).

Despite all the effort made by the government to improve education in Malaysia since its independence, Malaysia is no exception in facing its 'education problem'. According to Azizah (1987), although Malaysia does not fall within the United Nations' classification of 'Least Developed Countries' (LDCs) at the time independence was achieved in 1957, it certainly shared one of the characteristics of the LDCs with regard to education. Colton (1983) who carried out research on education in the least developed countries, proclaimed that upon gaining independence many of the LDCs:

> ...inherited systems of education which were not only irrelevant, but in many instances ran counter to the needs of local social structures, economies, traditional cultures and national goals. These inherited structures were generally rigid, hierarchical, highly centralised academic systems. They selected and trained an elite in the skills necessary to work in the 'modern' sector in order to best utilize local resources for the good of the colonising country. (Colton, 1983 :3).

1.4 Research Problem

According to the 1970 population census, 44.7 per cent of its 10.8 million population were below 15 years of age, and 70.4 per cent in the 0-29 age group (Government of Malaysia, 1976). This has not changed much over the years. In the 1980 population census, 43.2 per cent of the population were represented by youths 15 years of age and younger (Department of Statistics Malaysia, 1984). This shows that "Malaysia has a large youthful human resource at its disposal" (Malaysia Ministry of Culture, Youth and Sports, 1974). But the 1970 population census also showed that the rate of educational progress was very low: only 38.2 per cent were literate and 61.8 per cent were illiterate (Government of Malaysia, 1976). Table 1.2 provides details of the literacy rate in Sarawak from 1970 to 1980. From the data in the table we can note the illiteracy rate for each ethnic group. In 1980 these were as follows: Malays 38% out of 257,804; Melanaus 48% out of 75,126; Ibans 65% out of 396,280; Bidayuhs 55% out of 107,549; Other Indigenous 55% out of 69,065; Chinese 36% out of 385,161 and Others 33% out of 16,597 (based on the 1980 census, DSMS, 1987). In other words, about a half of Sarawak total population in 1980 were illiterates and it is

Table 1.2
Literacy Rate (percent) by Ethnic Group and Sex, Sarawak, 1970–1980

Ethnic Group	Males			Females			Total				
	1970	1980	1970–1980 % point change	1970	1980	1970–1980 % point change	1970	1980	1970–1980 % point change	Males/Females Literacy ratio 1970	Males/Females Literacy ratio 1980
Malays	57	72	15	30	51	21	43	62	19	1.9	1.4
Melanaus	43	63	20	20	42	22	31	52	21	2.2	1.5
Ibans	29	45	16	12	26	14	20	35	15	2.4	1.7
Bidayuhs	37	54	17	18	36	18	27	45	18	2.1	1.5
Other Indigenous	36	51	15	19	38	19	28	45	17	1.9	1.3
Chinese	69	81	12	51	68	17	60	74	14	1.4	1.2
Others	66	74	8	47	56	9	58	67	9	1.4	1.3
Total Mean	49	64	15	28	46	18	38	55	17	1.8	1.4

Source: Ko, Sarawak Gazette, Oct. 1984: 8 (Table 3).

unlikely that this number has changed appreciably in the last few years.

The *Berita Minggu*, a local weekly newspaper dated 29th April 1979 also reported that 3,471 students of Primary Four in various primary schools in Terengganu were illiterate. Although there is no empirical evidence from studies done in Sarawak, it is possible that Sarawak also faces the same problem on the basis that:

(a) Sarawak gained its independence through Malaysia sixteen years later than Terengganu which already had independence with Malaya in 1957; and

(b) the full implementation of **Bahasa Malaysia** through **Dasar Bahasa Kebangsaan** (National Language Policy) in Sarawak was not completed until 1985 and that was twenty years later than Terengganu and other states in Peninsular Malaysia.

Cummings (1980) stressed the importance of education as a major factor responsible for developing a country. He gave examples of highly successful development found in countries such as Japan, South Korea, and Singapore where human resources have been emphasized. Human resources constitute the foundation upon which material development can occur, and education represents a major form of human resource development.

Harbison and Myers (1964), also, succinctly expressed the importance of the strategic sector of the labour force for developing countries because

> ...the building of modern nations depend upon the development of people and organization of human activity. Capital, natural resources, foreign aid, and the international trade, play important roles in economic growth, but none is more important than manpower. (page 15).
>
> ...the underdeveloped countries need high level manpower just as urgently as they need capital. Of all the resources required for economic development, high talent manpower requires the longest 'lead time' for its creation. Dams, power stations, textile factories and steel mills can be constructed in a few years, but it takes 10 to 15 years to develop managers, engineers, and the administration to operate them. The existence of such manpower is essential if the countries are to achieve self-sustaining growth. (page 17).

What would be the prospects for economic development of manpower resources if the nation faced a high rate of illiteracy? Malaysia is well aware of the necessity of using education to develop such manpower, a step towards social and economic development. The government has taken a keen interest in promoting literacy and, thus, the pressure on education facilities is evidenced by more and more crowded classrooms, sometimes reaching to over 50 student enrolments per class. Apart from that, separate morning and afternoon sessions are conducted to overcome this problem (Arshat, 1986). Since 1980 an increase in the class-teacher ratio has jumped up from 1:1.2 to 1:1.5. In primary schools alone, with about 75,600 trained primary teachers in 1980, the shortage of teachers was estimated to be about 9,200 (Government of Malaysia, 1984). Would such crowded classrooms give satisfactory learning and teaching environments?

Would there be 'over-load' work faced by teachers since there is a great shortage of teaching staffs?

The government tries to encourage higher standards of literacy and skill development for significantly larger numbers of young people within the working age population, 15 years old and above by encouraging them to remain longer in school and to join the labour force much later. The problem is how this could possibly be achieved in spite of our rigid national curricula which are not flexible enough to provide equal opportunities for both 'fast' and 'slow' learners to obtain a good education. There are considerable school dropout problems in which in some areas, out of 74 enrolments 45 per cent are dropouts (Ahmad, 1981). Moreover, there are examination barriers that prevent students from going further in their studies and remaining longer in school. These examination barriers are the **Sijil Rendah Pelajaran** (Lower Certificate of Education), **Sijil Pelajaran Malaysia** (Malaysia Certificate of Education), **Sijil Pelajaran Vokesional Malaysia** (Malaysia Vocational Certificate of Education), and **Sijil Tinggi Persekolahan Malaysia** (Malaysia High Certificate of Education).

Unemployment is another major problem faced by a developing country like Malaysia, especially at this time of inflation where some jobs have been frozen. According to the Government of Malaysia (1986), unemployment rose from 5.7 per cent in 1980 to 7.7 per cent in 1985 and to an estimate of 10.1 per cent in 1990. The number of unemployed in 1985 amounted to 448,600 compared with 292,000 in 1980

for the whole nation. In the case of Sarawak, among the unemployed, 50 per cent were youngsters particularly those in the 15-20 age groups who were first-time job seekers. In other words, they were the school leavers of junior secondary, senior secondary, vocational and post-secondary schools.

Despite an overall slackness in manpower demand, skill-specific shortages continued to be experienced during this **Rancangan Malaysia Kelima** (Fifth Malaysia Plan) of 1986-1990. According to the Employment Turnover Survey (ETS) (Malaysia Government, 1986), there were shortages at the skilled and semi-skilled levels and these included among others, medical officers, veterinary officers, marine officers, electronic and public health engineers, machine operators, electronic technicians, machine fitters, blacksmiths and sheet metal workers.

These 'science and technology' jobs need considerable science background, preferably candidates with a science qualification from the science stream of school or college. The main problem is that there are always more arts than science students in the upper secondary and post-secondary schools. As reported by the Government of Malaysia (1986), the total recruitment of arts students in upper secondary schools (Form 4 to Form 5) in 1985 was 215,067 compared to science students of 94,548; and in post-secondary schools (Lower and Upper 6) there were 27,745 arts and 16,104 science students. One of the reasons for the negative attitudes of students towards science might be lack of

science teachers. There was evidence that, in 1985, the upper and post-secondary schools experienced a shortage of about 2,300 graduate teachers especially in science subjects such as general science, physics, chemistry and mathematics. Conversely, excess of teachers was experienced in arts subjects such as history, economics and geography (Government of Malaysia, 1986). Would the shortage of science teachers affect the academic achievement particularly of the science students? Do schools, teachers and parents give positive views and motivation to their children towards science?

In the case of Sarawak, in spite of being underpopulated and lacking skilled manpower, it is one of the richest states with natural resources such as timber, petroleum and natural gas, pepper, rubber, and many other minerals which are still unexploited. Thus, the state's development will depend largely on its own people as the State Government still controls immigration stringently even on fellow Malaysians from other states in the Federation. As such, the education and training of its own **anak tempatan** (local people) or **anak negeri** (state nationals) will have to be widened and quickened, but a high rate of failures in school external examinations every year affects the state adversely.

Public concern about the weakness of learning among Malaysian students has been discussed in the local mass media from time to time in the recent years but there has been almost no serious study undertaken to investigate this

concern. Philips (1977) found that the main weaknesses could be attributed to a number of factors: the staff, time and space, and the lack of resource materials such as books in the national language. It, also, has frequently been suggested that Malaysian students are so used to 'spoon feeding' that they cannot learn without it (Rohana Zubir, 1988). In her study, Rohana explored the truth or falsity of what has been encapsulated in the phrase 'Malaysian students' syndrome' by exposing students to individualised learning. It was clear that her study proved the falsity of this syndrome. According to her, there was strong evidence that Malaysian students have a great potential for self-help, possess considerable determination and are capable of independent learning if given the right learning environment. She, also, stated that there was evidence that independent learning generates a better quality of learning.

The present research, exploring factors relating to achievement of high-school students in Kuching City, Malaysia, is an attempt to provide new information on some of the most salient variables influencing the learning process. A review of research has indicated that some of the most important variables are learning approaches and styles, school motivation, locus of control, optimism and student's demographic variables. The following are the operational definitions of the concepts used in this research and the rationale for their selection.

Before going on to a discussion of these psychological concepts, the nomenclature being used needs to be considered. According to Curry (1983), one of the chief difficulties preventing significant progress in application of learning styles to education practice is the confusion of definitions. In the current literature of educational psychology, for example, regarding learning, one will always encounter different terms and concepts such as 'cognitive style', 'learning styles','learning strategies', 'learning approach', 'perceptual style','learning process', 'learning orientation', or simply 'way' of learning.

1.5 Operational Definitions of Concepts Associated With Learning

1.5.1 Learning Approaches

Hawes and Hawes (1982) define learning style as a way in which a student is best able to learn visually, aurally, by motor activity, or by a combination of these. Page and Thomas (1977) define learning style as a preferred mode of problem- solving, thinking or learning used by an individual. They sometimes refer to learning style as cognitive style which may be conscious, unconscious, or specific to many or only a small number of tasks.

Marder and Johnson (1988), also, use cognitive style for learning style, which means information processing habits that represent the learner's typical modes of perceiving, thinking, remembering and problem solving.

Gorham (1986) refers to Keefe's definition of learning styles as the "cognitive, affective, and physiological traits that serve as relatively stable indicators of how learners perceive, interact with, and respond to learning environments". According to Gorham (1986), learning style elements may be conditions under which an individual is most comfortable and prefers to learn, or factors which must be considered in understanding how information will be decoded and stored.

The concept of cognitive style, according to Wilson (1981), summarises and links different features of personality and attitudes. It functions as a "tracer element" distinguishing between attitudes, temperament and motivation of different people. Wilson argues that cognitive style has implications both for what students learn and how they should be taught. Messick (1976) gives a broader definition of cognitive style as high-level heuristics that organise and control behaviour across a wide variety of situations.

The distinction between 'strategy' and 'style' is also not clear cut. According to Entwistle *et al.*(see Wilson, 1981), strategy can be defined as ' a description of the way a student chooses to tackle a specific learning task in the light of its perceived demands', whereas they see a style as 'a student's preferred way of tackling learning tasks generally'. Messick (1976) describes styles as 'habitual modes of information processing' linked to basic personality and cognitive structure, and hence not

susceptible to modification. On the other hand, he argues that strategies are more specific and flexible, reflecting 'task requirement, problem content and situational constraints'. Thus, Messick confirmed the suggestion that strategies are more flexible and modifiable than styles regarding student's learning.

Marton and Saljo (1976a, b) and Svensson (1977) both use the term 'approach' to describe forms of understanding in students' learning. Entwistle, who is very much influenced by Marton's model, also prefers to use the term 'approach'. In Entwistle's model three approaches to learning are distinguished: deep approach, surface approach, and strategic approach. Style comes only under one of the approaches, the deep approach. Entwistle's learning styles are comprehension or 'holist style' and operation or 'serialist style'. These terms will be defined more precisely in Chapter II on my discussion on the literature review.

According to Taylor (1987), learning approaches draw attention to the crucial importance of intentionality in academic learning, previous knowledge and conceptualization. He emphasises, also, the influence of personal motives for studying not just on the degree of effort exerted, but also on the direction and quality of the effort.

Considering all the definitions mentioned above, a definition of learning approach could be simplified as a preferred learning mode of students, which involves the

dynamics of the situation in which learning occurs, the major areas of content interest and the general modality through which learning is preferred. The difference between 'approach' and 'style' in Entwistle's model could be: the approach dichotomy focuses on the referencial ("*What*") aspect, whereas the style focuses on the organizational ("*How*") aspect.

1.5.2 School Motivation

First of all, the word 'motive' comes from the Latin for 'move' and this is captured in George Miller's definition: "The study of motivation is the study of all those pushes and prods - biological, social and psychological - that defeat our laziness and move us, either eagerly or reluctantly, to action" (Gross, 1990: 416).

Rubin and McNeil (1983) state that motives are a special kind of cause which, 'energize, direct and sustain a person's behaviour including hunger, thirst, sex and curiosity'. They classify motives into two major categories, (i) survival or physiological motives, and (ii) competence or cognitive motives, with social motives representing a third category. So according to Rubin and McNeil's categories, school motivation comes under the second one - competence or cognitive motives.

Trying to define 'motivation' as a concept associated with learning is another task because different authors use different terms and concepts. Such terms as 'achievement motivation or need for achievement (nAch)' and 'school motivation' are similar in many ways, as the latter term often involves achievement in the school context.

Rothstein (1990:357) defines achievement motivation as an attitude or action related to the need for achievement, that is, the need to perform successfully. According to Entwistle (1988:20), achievement motivation describes rewards from competitive success - the boost of self-confidence from doing something better than others. He, also, argues that alongside achievement motivation or 'hope for success' comes 'fear of failure', the fear of doing badly and being criticised, which pushes some people to work harder.

Kozeki (1985) uses the term 'school motivation' which will be adapted throughout this study, instead of achievement motivation because of its wider scope. Entwistle (1988: 20) claims that most of the descriptions of achievement motivation describe rewards or punishments in cognitive terms, but Kozeki in his 'school motivation' finds that rewards and punishments are not only described in cognitive terms, but, also, in terms of emotional and moral sources of satisfaction in schooling. Kozeki suggests that parents, teachers and peer groups affect pupils' motivation towards school. Thus, he categorises his three

domains of school motivation as affective, cognitive and moral and these indicate the form of reward the individual finds most satisfying.

1.5.3 Locus of Control

Rothestein (1990:143) defines 'locus' as location and that locus of control refers to the place where responsibility for an outcome is attributed. The concept of "internal-external" locus of control introduced by Rotter (1954) refers to two distinct groups of people. People with an "internal" locus of control regard some events as being within their own control, assume responsibility for things themselves and believe that they are responsible for their own success. People with an "external" locus of control attribute behaviour and similar phenomena to external forces beyond their control, believe in factors such as luck, good fortune or the influence of other people as the cause of their success.

Fanelli (1977) refers to the term 'locus of control' as the perceived causality of behavioural outcomes. At one extreme, the 'internal' individual thinks of himself as being responsible for his own behaviour. The internal person blames himself for his failures and accepts praise as deserved for his triumphs. At the other extreme, the 'external' individual sees others or luck or circumstances beyond his control as responsible for his behaviour: he will not blame himself for his errors and will not think of his successes as caused by his own efforts. Thus, locus of

control can be defined as our beliefs about what controls events in our everyday lives and how we get reinforced for our actions.

1.5.4 Optimism and Pessimism

Hawkins (1988:589) defines optimism as 'a hopeful view or disposition; a tendency to expect a favourable outcome. The conceptual dimension of "optimism" versus "pessimism" is in many respects straightforward and intuitive. According to Carver and Scheier (1985), in regard to human performance, the dimension of optimism versus pessimism rests on a fundamental difference between people in their expectations of good versus bad outcomes. They define optimists as people who generally expect things to work out well for them, whereas pessimists are people who expect things to go from bad to worse.

1.6 Rationale behind selecting these factors

Many studies in the literature review, which is discussed later in Chapter II, describe motivation in relation to educational processes and achievement. School-motivation instrument uses items relating to classroom experiences which are specifically designed to predict academic attainment (Kozeki and Entwistle, 1984). Entwistle and Wilson (1977) found that in work on the academic achievement of students, three distinct types of successful students were identified. Entwistle and Kozeki (1983) indicated that each group of students seemed to follow a

different path to success which was dependent on contrasting motivational styles. The first group appeared to be motivated by 'hope for success', the second by 'fear of failure' and the last by 'intrinsic motivation' rooted in personal interest and syllabus-freedom.

The relationship between academic motivation and scholastic success is, also, well established. Entwistle (1974), Entwistle *et al.*(1974), Biggs (1978) and Entwistle and Ramsden (1983), found that different types of academic or school motivation are associated characteristically with contrasting approaches of learning.

"Locus of control" is another predictor factor of achievement being selected because according to Lefcourt (1972: 32):

> ...Internal-External control is found to be relevant predictor of resistance to influence, cognitive activity and achievement related behaviours.

"Internal" control represents the attribution of causality to internal forces while "external" control represents the attribution of causality to forces outside of the self. Many researchers into aspects of personal causation and motivation have found it useful and meaningful to employ the construct 'locus of control' and attempt to assess it in terms of internality or externality as a relatively stable dimension of personality (Louden, 1977: 143). As assessment of "locus of control" is a measure of the degree to which an individual feels he has power to control his environment, it would be interesting to see if it has

significant relationships with achievement, school motivation, learning approaches and learning styles. There have been numerous researches on locus of control using several different scales such as those constructed by Bialer (1961), Crandall *et al.* (1965), James (1957), Nowicki and Strickland (1973), Reid and Ware (1974), and Rotter (1966).

The third factor to consider is the relationships, if any, between optimism, school motivation, learning approaches and locus of control. According to Carver and Scheier (1988), the dimension of "optimism" versus "pessimism" rests on a fundamental differences between people in their expectations of good versus bad outcomes. They outlined three salient features of their theoretical analysis of the effects of confidence and doubt: (1) People who have favourable expectancies continue to focus on task efforts; (2) People who have unfavourable expectancies have a tendency to disengage from attempts at goal attainment; (3) People who have unfavourable expectancies tend to become mired in their distress. Hence, it is likely that the degree of optimism is a salient predictor of a student's performance and achievement in school.

The last factor considered important concerns associated with students' demographic variables such as school attainment (academic streams), gender, ethnicity, residency (urban or rural areas and boarding or day schools), size of family and family educational background. It is important to consider these variables as the population of the

present study consists of various ethnic groups of different cultures, different beliefs and they come from different localities, status and ways of life.

1.7 Specific Problem

The Utusan Malaysia, another daily newspaper dated 3rd April 1989, reported that there was an overall improvement in the results of the 1988 Malaysia Certificate of Education examination or **Sijil Pelajaran Malaysia** (common Malaysian abbreviation, SPM) with 73.1 per cent of the candidates scoring grade one, two and three. This was 0.6 per cent better than the percentage achieved by candidates in the 1987 SPM examination. Turning back to Sarawak, out of 13,329 candidates taking the examination at the end of 1988 only 68.9 per cent or 9,183 candidates passed. Thus, the overall result of the 1988 SPM for the state of Sarawak was comparatively below that of the rest of Malaysia as the average of the overall national results was a 72.5 percent pass rate. A three-year analyses of comparative results (passing percentages) of the SPM between Sarawak and the national level gave the following data as shown in Table 1.3.

TABLE 1.3

A Comparative Results of the SPM Between Sarawak and National Level, 1986-1989

	SARAWAK	NATIONAL
1986	58.8%	70.0%
1987	68.7%	73.5%
1988	68.8%	75.7%
1989	74.9%	77.0%

(Source: Sarawak Education Department, 1989).

These passing percentages, as in Table 1.3, covered those who got grades one, two and three. Usually, only those in grade one and grade two are able to continue further to the lower-sixth form due to lack of places. Those in grade three, if lucky enough, would hope to get jobs equivalent to clerical work in the government sector or blue-collar jobs in the private sector, but some become jobless like those who were failures.

There has been very little empirical research conducted in the field of educational psychology in the Malaysian perspective, particularly on such variables as school motivation or achievement motivation, learning approaches and learning styles in terms of their relationships with students' academic achievement. This area of study seems to have been relatively neglected by many researchers. Some small local studies, whenever they occurred, however, were all based in Peninsular Malaysia.

Wan Rafaie (1972), for example, conducted a comparative study on achievement motivation between Malay students in Malaysia and Australian students in Australia. Ng See Ngian (1972) focused on academic achievement but related it with socio-economic status and school anxiety. Closer to the interests of the present study is the work of Habibah Elias (1978), which emphasized the importance of achievement motivation, intelligence, parental encouragement and socio-economic status on academic performance, but her subjects were mainly primary school students.

The present study is attempting to measure such diverse variables as school motivation (parental and teachers' encouragement and the influence of peer group); approaches to studying; styles of learning; locus of control (external or internal); students' own optimistic or pessimistic views and specific demographic variables of students in high schools. How these factors are related to academic performance or achievement will be explored. In the past there has been no such empirical study conducted in this field within secondary schools in Sarawak.

In this study it is necessary to assess students' academic achievement from their **SPM external** examination results taken at the end of Form Five and to relate these results with other variables. It has become a high priority to determine the most effective and efficient style or approach to learning which students prefer. This is important because there are enormous amounts of information or knowledge that students have to learn and retain in a very short and limited two-year period of study in the lower and upper sixth forms before sitting for another external examination, the **Sijil Tinggi Persekolahan Malaysia (STPM)** or Malaysia High School Certificate. Students' recognition of their own learning styles can help them make useful decisions regarding their approaches to selecting and processing information and this has significant implications for both cognitive and affective learning (Gorham, 1986). Thus, by being aware of their own learning styles and approaches, sources of their

motivation, locus of control, and the extent of their optimism towards their studies,it is postulated that they may achieve better academic results; a salient ticket to higher education and more rewarding professional jobs.

1.8 Significance of the Study

1.8.1 Its Applications

Inevitably some students encounter difficulties when entering the Lower Sixth Form and may find themselves in danger of failing in the forthcoming STPM external examination. The results of this examination are determining factors in whether they can go on for further study in a university or college, or to stop schooling altogether. If this danger can be recognised early enough, some remedial actions may be possible.

They may need guidance by their teachers to identify their own 'ideal' approaches to learning and to adjust themselves to their new courses and learning environments. It would be wrong to assume that all high schools students know how to study effectively and are, also, highly motivated.

By understanding the various approaches and styles a learner may adopt and by identifying their motivational styles and the main parental, teacher, and peer influences, it is suggested that: (a) a learner may feel more 'freedom to learn' independently, and, thus lead to learning that is more diagnostic and more alterable; (b)

a teacher could possibly give guidance and remedial actions to make good use of motivation associated with what Kozeki called 'Fear of Failure' or 'Hope for Success'; and (c) the contribution of this study might be useful in planning and encouraging learning-teaching strategies, establishing a more motivating learning-teaching environment and assisting in national curriculum developments. Knowledge of these factors is important in order to identify institutional problems that need improvement.

1.8.2 Its Implications

> The overall objective of education and training is to promote national unity. The education and training sector is one of the most important social investments that will benefit the country in the long run. The role of education and training in Malaysia is to produce knowledgeable, trained, and skilled individuals to meet the manpower requirements as well as the growing social needs. Future national development of the country is expected to bring forth challengers that require manpower to be innovative and equipped with knowledge and training in science and technology, management, and related skills. Equally important is the need for the national education system to mould disciplined, diligent, and motivated individuals.
> (Government of Malaysia, 1986: 483).

Perrott (1975) indicated that a considerable emphasis on developing the skills of scientific inquiry is becoming more important if we expect the pupil to become a better citizen in the sense of being more concerned and more competent to reach social decisions based on science, and, essential if we expect to bring science into the general culture, in proportion to the rapidly increasing need for scientists and technologies in this modern society. She suggested that education has an important role to play, whereby, teaching-learning styles and methods in relation

to instructional objectives need recognition, as did the need for pupils to have the opportunity for individual learning activities.

Recent researchers tend to appreciate that education involves various types of learning which relate to a range of important constructs or concepts associated with motivation (Balls, 1977; Entwistle and Ramsden, 1983; Entwistle and Kozeki, 1985). According to Meyer and Parson (1989: 137), the results of their studies "offered to teachers the possibility of illuminating the complex learning processes operating in higher education, and acting significantly on them".

There is increasing evidence that student academic achievement and performance in other school tests are strongly influenced by motivational factors (Fyans, 1979; Hill, 1977; Maehr, 1979). The researcher has been unable to trace any previous studies involving groups of variables such as school motivation, learning approaches, learning styles and locus of control in relation to an individual's achievement; achievement relationships with academic-stream groups or ethnic groups; and achievement in each subject area. By knowing the relationships of these important variables with achievement in different subject areas will provide salient information leading to achieving the mentioned Malaysian educational and training objectives.

Carver and Scheier (1988) noted that "optimism versus pessimism" is a major determinant of effective coping and successful performance, especially in the medical and psychological fields. Thus, the present study aims to explore the relationships between the construct "optimism" and these other variables within the educational field to discover if such a description of an optimist, as pictured by Carver and Scheier's theory, does exist.

1.9 Objectives and Limitations

1.9.1 Objectives

The primary objective of the present study is to determine to what extent such students' variables as learning approaches, learning styles, school motivation, locus of control, optimism and some selected demographic data, contribute to students' outcomes. The outcome criteria, in this case, are their results in the SPM external examination. This examination is a prerequisite for entry to the lower sixth form, their post-secondary schooling, before proceeding to higher education courses at college or university in Malaysia.

Secondly, this study tries to find answers to the following seven problems. The main consideration is to translate the initial ideas into precise questions as follows:

1. *What are the relationships between school motivation, learning approaches, learning styles and academic achievement of students in different subject areas?*

2. *How does students' optimistic (or pessimistic) view of academic study relate to their learning approaches,learning styles and school motivation?*

3. *Are there differences in achievement between students who possess "internal" locus of control control and those who possess "external" locus of control in different subject areas?*

4. *What are the contributions to student achievement in the* **Sijil Pelajaran Malaysia** *(Malaysian Certificate of Education) external examination in Malaysia of such student variables as gender, residency, parents' qualifications, day scholar/ boarder, learning styles and approaches, school motivation, locus of control and optimism-pessimism view?*

5. *What are the most important predictor variables contributing to student achievement in different subject areas?*

6. *Are there differences in the contribution of school motivation, learning approaches, learning styles, locus of control and optimism to achievement within different ethnic groups?*

7. *What are the most important variables predicting achievement in (a) arts stream and (b) science stream?*

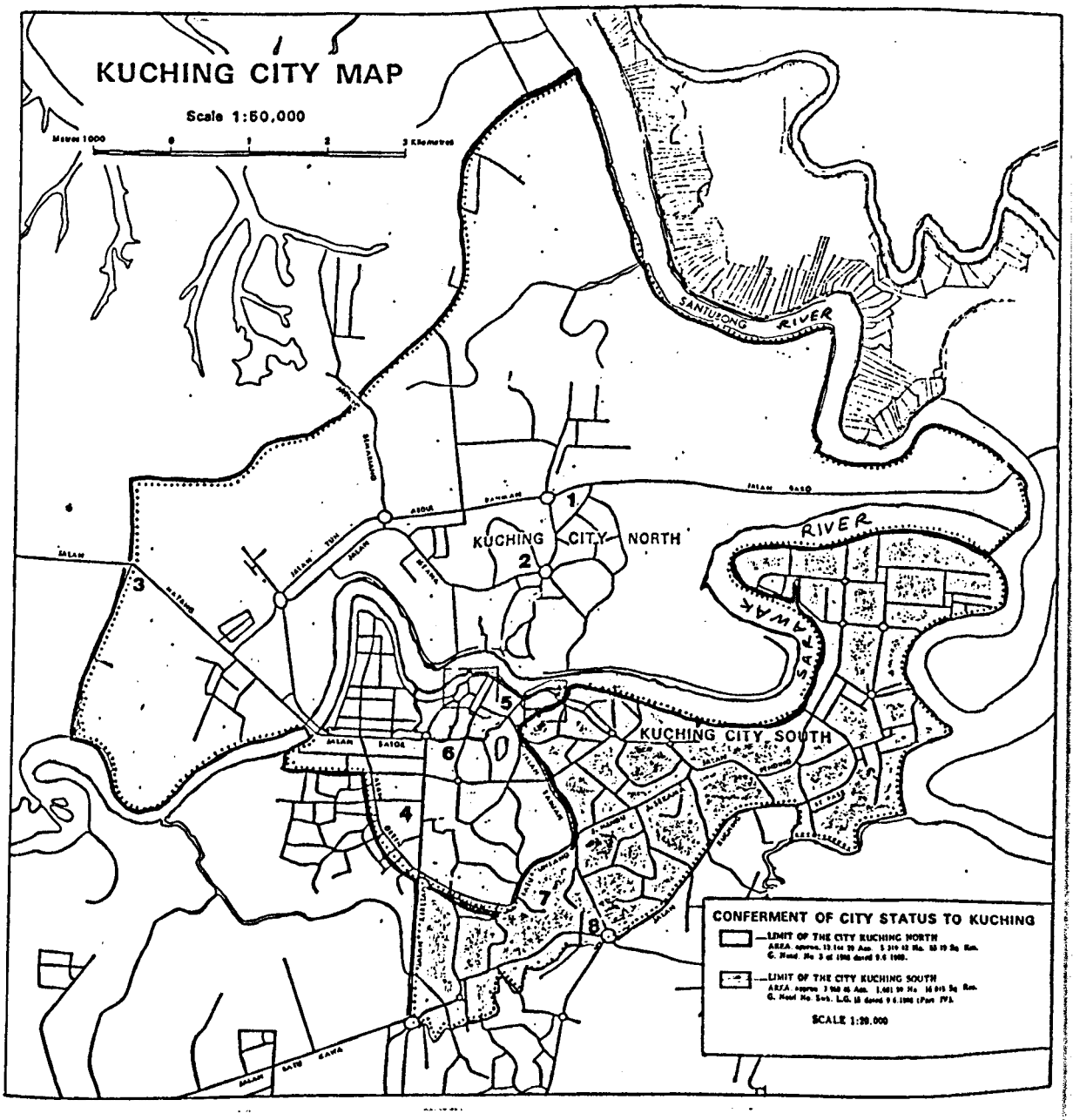
Apart from these research questions in my main study, one research question is also examined earlier in my pilot study to test the scales' reliability and whether the Malaysian version is applicable for assessing students in Malaysian contexts. The research question, being a comparative study, is as follows:

Is there any significant difference between learning approaches and motivation among the British, Hungarian and Malaysian adolescents?

1.9.2 Limitations

To study all the current educational issues in the state of Sarawak would require much time, money, and energy. To date, there are 136 secondary schools throughout Sarawak, but most of high schools are found in the Kuching City which provide better school facilities and more boarding or residential high schools for students from various Divisions and Districts throughout the State. Due to the limited time and budget allocated for this study, I will limit it to:

FIGURE 1E: KUCHING CITY MAP



NAME AND LOCATION OF SCHOOLS:

1-KOLEJ DATUK PATINGGI ABANG HAJI ABDILLAH
2-S.M.K. TUN ABANG HAJI OPENG
3-S.M.K. SHEIKH HAJI OTHMAN ABDUL WAHAB, MATANG
4-S.M.K. GREEN ROAD
5-S.M.B. ST. THOMAS
6-S.M.B. ST. JOSEPH
7-S.M.K. BATU LINTANG
8-S.M.K. DATUK PATINGGI HAJI ABDUL GHAPOR

1. the city of Kuching, the capital of Sarawak. Kuching was upgraded to 'city' on 31st. August, 1988 when the State celebrated its 25th.Anniversary within Malaysia. According to Munan (1988) Kuching, at the time it became a city, had 300,000 inhabitants. The city covers an area of 69.205 square kilometres, consisting of 53.19 square kilometres of the City Kuching North and 16.015 square kilometres of the City Kuching South, as shown in Figure 1E.

2. the 1990 students of the Lower Sixth Form in all the eight high schools available in the Kuching City. They were, on the average, aged seventeen years old and had passed the 1989 SPM external examination and were considered among 'the lucky ones' to continue to the post-secondary schools. Among the eight high schools, six were situated in the City Kuching North, namely:
   - Kolej Datuk Patinggi Abang Haji Abdillah
   - Sekolah Menengah Kerajaan Tun Abang Haji Openg
   - Sekolah Menengah Kerajaan Sheikh Haji Othman Abdul Wahab
   - Sekolah Menengah Kerajaan Green Road
   - Sekolah Bantuan Kerajaan St. Thomas
   - Sekolah Bantuan Kerajaan St. Joseph

   (see below for translation of terms).

The other two high schools were in the City Kuching South and these were newly up-graded to post-secondary schools in 1989. They are:

- Sekolah Menengah Kerajaan Datuk Patinggi Haji Abdul Ghapor
- Sekolah Menengah Kerajaan Batu Lintang.

Definition of Terms

1. **sekolah** - school
2. **menengah** - secondary
3. **kerajaan** - government
4. **bantuan** - aided
5. **kolej** - college

Thus, **sekolah menengah kerajaan** means the school which is wholly supported and financed by the Federal Government. **Sekolah Bantuan Kerajaan** is an aided school, partly supported and financed by the Federal Government and partly by missionary bodies such as the Anglican or the Roman Catholic churches. In this context; **kolej** (college) is no different from a post-secondary school except that the Sarawak Education Department puts it in a 'special' category because it offers matriculation courses to well-equipped students entering local universities.

Four of the above schools, namely Kolej Datuk Patinggi Abang Haji Abdillah; Sekolah Menengah Kerajaan Tun Abang Haji Openg; Sekolah Menengah Kerajaan Sheikh Haji Othman Abdul Wahab; and Sekolah Menengah Kerajaan Datuk Patinggi Haji Abdul Ghapor, are residential schools (or boarding schools) which accommodate urban and rural students from various districts and divisions throughout Sarawak.

1.10 Summary

In this chapter we have discussed the problems of the shortage of skilled-manpower in Malaysia and of the 'poor' SPM external examination results in Sarawak. It is important in this study to measure students' learning approaches and styles, school motivation, locus of control (internal or external control), and their optimistic (or pessimistic) views and whether or not these variables relate to their academic achievement. It is one of the main objectives, as well, to discover the most important predictor variables contributing to students' success. Knowledge of these factors is important in order to take some remedial action to give guidance and to identify institutional problems (school and home) that need improvement.

The educational system in Malaysia since the Colonial period of 1786 to the present time was discussed in-depth. The British played an important role in providing a restricted secular education to the children of Malaya, Sarawak and Sabah, who after receiving basic skills would remain in their own communities. In spite of these weaknesses of the British educational system during the period 1786 to 1941, it is rather unfortunate that the Razak Committee set up in 1956 opted to pursue a similar policy and system of education. After gaining independence,

however, the British vernacular school system was changed to the so called 'national system of education', but we still have separate ethnic schools, namely, **sekolah rendah kebangsaan** (national primary school); **sekolah rendah jenis kebangsaan Cina** (national-type Chinese primary school) and **sekolah rendah jenis kebangsaan Tamil** (national-type Tamil primary school).

Had the Razak Committee pursued a single type of primary school to break down the language barrier as far as possible and, thus, get the immigrant population more assimilated into the Malaysian society, it is likely that the future Malaysian generations would have had more unity and solidarity. The immigrants, in the first place, could have been persuaded to accept a 'one language and one nationality' policy, as in Indonesia, as a pre-requisite for the individual to become a Malaysian citizen and to regard Malaysia as his homeland. With the recent introduction of the new school curricula **'KBSR'** and **'KBSM'**, it is hoped that the unification of the Malaysian society will be truly achieved.

In Sarawak, as a result of twenty years behind schedule of the implementation of **Bahasa Malaysia** in schools and the 'over-emphasis' of English language as a second language, it would not be surprising if Sarawak students were less proficient in the national language as

their colleagues in Peninsular Malaysia. In regard to the present study, it only covers all students in the Lower Sixth Form in 1990 in Kuching City. Their average age was about seventeen years. These students not only come from the urban areas of Kuching City but also come, as residential students, from a wide area of rural Sarawak. Thus, the selected sample involves all ethnic groups from a variety environmental backgrounds. In order to understand more fully the current research issue in its proper perspective, a review of the relevant literature is undertaken in the next chapter.

CHAPTER II

LITERATURE REVIEW

2.0 Theoretical Background

This chapter outlines some learning views and theories which are relevant and related especially to the present study of human learning. The researcher neither can hope to review in this one chapter all the theorists' many contributions towards learning, nor does he feel it necessary. Among dominant theories of learning, which are still popular today are the behaviourist theories founded by Thorndike (1913, 1931), Watson (1924) and Skinner (1974); the cognitive or information processing theory of Norman and Rumelhart (1978), Ausubel (1968), Bruner (1966) and Resnick (1983); the individual differences theories of Eysenck (1967), Kozeki (1985) and Pask (1976a, 1988); the interactionist theories of Cronbach (1957) and Entwistle (1988); and the experiential theories of Marton *et al.*(1984), Covington (1983) and Rogers (1969). In the forthcoming paragraphs, the conceptualization and previous researches on achievement or academic motivation, approaches to learning, optimism and gender differences and their associations with recent learning theories will be discussed.

2.1 Conceptualization of Motivation in School Learning

Researchers are beginning to appreciate that education involves many different types of learning which relate to a range of important constructs or concepts associated with motivation. The forthcoming paragraphs will discuss these concepts of motivation as they apply to education.

> The fact is that, for any given child, there seems to be a preferred motivational style. We coin this term to indicate that each child has more or less of each of the long listings of motives. Assessing this internal integration of motives, this motivational style, is perhaps a key to further understandings in this area.
>
> (Ball, 1977:189).

The term motivation is usually defined by psychologists as 'the processes involved in arousing, directing, and sustaining behaviour' (Ball, 1977:2). Motivation for a person's behaviour is something that is inferred. It is something within an individual, interacting with the environment, that arouses, directs, and sustains behaviour.

One of the best known theories of motivation in a school environment is the *academic (achievement) motivation* (sometimes referred to as '*need for achievement*' or *n-Ach*) theory based on the substancial work of David McClelland (1951, 1955, 1958) and John W.Atkinson (1954,1957,1964). From these beginnings, stretching back almost a half

century, research and theory on achievement motivation became quite multifaceted and multidirectional. Achievement motivation, as pointed out by Gagne (1970), should not be equated with 'motivation to learn'. He defines motivation to learn as the learner's resolve or determination to put in some effort to perform a learning task. It is a momentary intention which may not be very resistant to distraction or frustration. On the other hand, achievement motivation is carried beyond the mastery of a task; it refers to a motive or personality trait which is rather stable in nature. McClelland (1961) conceived the term achievement motivation, as meaning that people have a need for achievement.

Research by McClelland and his associates began with initial explorations into the nature and measurement of the achievement motive. He was, from the beginning, concerned with broad questions such as how achievement motivation showed itself both in the individual and in society. McClelland *et al.* (1955) postulated that there is a general human tendency to achieve success and to avoid failure. Some students will seem more interested in striving for success, while others will seem more motivated to avoid failure. Thus, in 1964 Atkinson developed a theory of anxiety and achievement behaviours in which test anxiety is equated with the motive to avoid failure and achievement motivation is equated with the motive to reach success.

Achievement motivation theory, better known as the 'risk-taking' model (theory), was elaborated further by Atkinson and Feather (1966) who specified the two dominant motives underlying achievement-oriented behaviours as (1) hope for success, and (b) fear of failure. They proclaim that these studies on achievement motivation can be measured by the Thematic Apperception Test (TAT) in which the student is asked to write stories about situations shown in drawings or by means of need achievement questionnaires. The student is expected to project into his writing indications of his need for achievement (n-Ach) or fear of failure. According to Lavin (1967), the literature describing the application of McClelland's technique to the prediction of academic performance has produced inconsistent patterns of results. Lavin argues that achievement motivation measured in this way is too general a drive; academic achievement is only one of the goals which would satisfy the motive.

Based on Atkinson's cognitive achievement motivation theory, Hill (1977: 18) made additional assumptions that

> Low-anxious children have stronger motives to approach success and obtain approval than to avoid failure and avoid disapproval. These children should do quite well in evaluative test situations. It is assumed that both approach and avoidance motives increase at higher levels of anxiety but with greater increases for avoidance motives. High-anxious children have stronger motives to avoid failure and disapproval and weaker (but still fairly strong) motives to approach success and approval.

High anxious children should do poorly in testing situations in which failure is likely or quite possible, but may do quite well in achievement situations in which the possiblity of failure and adult disapproval is minimized (Dusek and Hill, 1970). Hill (1976) suggested that anxious children generally rely more on adult evaluation and less anxious children are more willing to evaluate the outcome of their achievement activities on their own.

There is increasing evidence that the performance of children on achievement and other school tests is strongly influenced by motivational and other test-taking factors (Fyans, 1979; Hill, 1977; Maehr, 1979). According to Fyans (1979), the interfering effects of negative motivation on achievement test performance are particularly strong for low income/minority and other highly test-anxious children. He noted that these students often become anxious and do not perform well under test pressure and have difficulty showing what they have learned in standard achievement test situations. Hill (1977) found elementary school children, who have high test-anxiety, are behind in reading and arithmetic basic skills test performance compared to low test-anxious children. Maehr (1979) noted that student's attributions of his success and failures and the presence or absence of continuing motivation, also, strongly affect his achievement.

The work of Cattell (1957) and his co-workers, among the many attempts to describe motivation in relation to educational processes, sought to explain behaviour in a wide range of social settings in terms of fundamental psychological drives (ergs) and sentiments. Cattell and Child (1975) suggested that:

> Social variables also have some effect on performance. ...there is ample ground for believing that role relationships, both inside and outside school or college, can affect the attitudes of students and hence their achievement....the domain of motivation in so far as the individual's acquired attitudes towards academic work, will be part and parcel of his sentiment structure, especially to his school, his self-concept, and his superego sentiment...a high measure of self-sentiment correlates with school achievement. McClelland's 'need for achievement' motivation is also closely related to this self-sentiment. The pupil who is high on superego tends to be conscientious and hence more likely to settle down to the dogged task of studying. (p.185).

In the 1960s, considerable more effort was put into developing scales or inventories of 'academic achievement motivation' which use items relating to classroom experiences or which are specifically designed to predict academic attainment (Kozeki and Entwistle, 1984). A typical example of an early inventory measuring unidimensional scales of academic (achievement) motivation was developed by Finger and Schlesser (1965) in the USA. Their inventory or scale, which contains a set of items intended to provide a good overall prediction ofacademic (achievement) motivation, influenced and prompted the development of a similar scale in Britain (Entwistle, 1968) and in Hungary (Kozeki,

1985). Regarding work on the academic performance of students, Entwistle and Wilson (1977) identified three distinct types of successful students. The first group appeared to be motivated by 'hope for success', the second by 'fear of failure', and the last by intrinsic motivation rooted in personal interest and "syllabus-freedom". Later Entwistle and Ramsden (1983) noted that these three types of motivation, together with extrinsic (vocational or instrumental) motivation, which was related to external rewards, were associated with contrasting approaches to learning.

Ball (1977) reviewed some of the many theories which have been used to try to understand motivation in an educational context. He defined motivation as the process involved in arousing, directing, and sustaining behaviour. Ball suggested that at least five distinct aspects or dimensions of school motivation could be identified.

1. Positive orientation towards school learning (including high aspirations, persistence and self-confidence);
2. Need for social recognition (seeking positive reinforcement from the teacher and competing with classmates);
3. Motive to avoid failure (fearing failure, high test anxiety);

4. Curiosity (perceptual); and
5. Conformity (to demands of parents, teachers or peer pressures).

The "locus of control" concept has become increasingly of more importance, as well, in theoretical and practical considerations of motivation (Fanelli, 1977). The concept of locus of control, first introduced by Rotter (1954) was derived from his social learning theory. It suggests that a person enters a situation with expectancies concerning the probable outcomes of his possible behaviours. Fanelli (1977:45) further defined locus of control as "*the perceived causality of behavioural outcomes. At one extreme (internal) the individual thinks of himself as being responsible for his own behaviour. At the other extreme (external), the individual sees others, luck or circumstances beyond his control as responsible for his behaviour*". Heckhausen (1977) incorporated the prediction of causality in his self-reinforcement model. He argued that an individual's subjective probability of success is determined by perception of competence in relation to an internalized standard of excellence. He suggested that success-oriented individuals prefer tasks and activities with an intermediate level of difficulty. When they experience success they attribute it mainly to internal factors (effort and ability), which they perceive as stable and controlable. This attributional bias results in a

maximal experience of positive feelings and in a minimal experience of negative feelings. As such, this attributional bias promotes a realistic success expectancy in the learning outcomes, and vice versa.

In contrast, failure-oriented individuals contribute outcomes to be caused by external factors such as the difficulty level of the tasks or bad luck, which is variable in nature. These failure-oriented persons are strongly influenced by prior negative expectancies, they usually have a low success expectancy and set themselves unrealistic goals which are either too high or too low. When they occasionally experience success, they consider it as good luck or as the result of too easy a task but when they experience failure they attribute it to internal, stable and uncontrolled factors such as having low ability themselves.

Many researchers into aspects of personal causation and motivation have found it useful and meaningful to employ the construct 'locus of control'; to attempt to assess it in terms of internality or externality and to regard it as a relatively stable dimension of personality. Internal control, then, represents the attribution of causality to internal forces. External control represents the attribution of causality to forces outside of the self. Consistent with the work of Rotter (1954) is the notion

that such attributions will themselves vary from time to time, not only in respect of varied situations and circumstances, but also in terms of the individual himself. Rotter and Mulry (1965: 474) stated,

> ....not only can situations vary in the degree to which people perceive that their own behaviour rather than the behaviour of others is the determiner of the reinforcement but individuals themselves can vary in the degree to whichthe same event in the same situation is perceived as a function of their own characteristics versus the characteristics of others.

Since the publication of the Coleman report (Coleman, 1966) which indicated that locus of control is firmly related to academic achievement, more than 40 studies have investigated the relationship between perception of locus of control and achievement (Bar-Tal and Bar-Zohar, 1977). They noted that 'internal' perception of control tends to be positively correlated with academic achievement. On the basis of these findings, it has been suggested that perception of control is an important personality variable which predicts academic success in schools (Morrison and McIntyre, 1971; Phares, 1976). This view is strengthened by the evidence that internal perception of control is systematically related to behaviours which increase the probability of successful academic performance, at least with respect to ninth grade Israel-Jewish students (Bar-Tal *et al.* 1980).

In addition, perception of locus of control has been observed to be related to level of aspiration. Gurin et al.(1969) and Lao (1970), for example, observed that students whose orientation was internal were characterised by higher educational expectations and aspirations than students whose orientation was external. It is possible that individuals who feel that they can control their own environment, also, believe that, since success depends on them, they can achieve more than externals who feel that they are dependent on the whim and desires of other people or events.

Stipek (1981) in her longitudinal study of first graders, found that children who had a more internal locus of control were more optimistic, and scored higher on an affective motivation measure at the end of the first grade than at the beginning. She found that some changes were effected by socio-economic status and academic achievement.

Fanelli (1972) found that, in a series of clerical tasks given to college undergraduates, internals tended to improve their scores from trial to trial significantly more than externals did. Fanelli also found that those internals, who reported a high value for achievement (determined by scores on the n-Ach category of the Edwards Personal Preference Schedule), got significantly higher scores on clerical tests than those internals who reported

a low value for achievement. He suggested that student ought to be internal in order to perform at a higher achievement level.

A study by McGhee and Crandall (1968), using pupils from third to fifth grades, found that high internal subjects consistently obtained higher scores in reading, mathematics and language than low internals. However, for girls, internal beliefs for success and failure could predict equally well their academic performance whereas for boys, their internal beliefs for failure were associated with their academic achievement rather than their internal beliefs for success. Messer (1972), using fourth-grade boys and girls, also found that the internals had higher school grades than the externals. In addition, he found that internal beliefs for failure provided better prediction for girls' performance while internal beliefs for success provided better prediction for boys' performance.

Uguroglu and Walberg (1979) analyzed 232 correlations of motivation (self-concept, locus of control, and achievement motivation) and academic learning reported in 40 studies with approximately 637,000 high school students. They found that 98% of the 232 correlations between motivation and academic achievement are positive.

Zimbelman (1987) examined the relations among achievement motivation, locus of control, and the occupational and educational aspirations of rural and metropolitan 11th graders from South Dakota. He found that rural subjects had lower occupational and educational aspirations but did not differ from urban subjects in achievement motivation and locus of control.

A British validation study by Reid and Croucher (1980) provided further evidence of superior attainment on arithmetic and vocabulary of high internal subjects. The evidence provided by these studies appears to indicate that individual differences in internal beliefs could be a useful variable to explain variation in academic performance.

A review of the literature showed a great many studies in this field in the U.K., U.S.A. and elsewhere but hardly any in Malaysia. In Malaysia, this research area on locus of control and its relationship to academic achievement has not received much attention. Among attempts in examining this relationship in the context of the Malaysian situation were studies by Zainal (1989) and Maznah Ismail and Foong (1984). Zainal (1989) attempted to see how students' background variables (gender, ethnicity, socio-economic status, parents' support for students' education, home environment, students' academic aspirations) and the social-psychological variable of locus

of control influenced the variation of academic achievement scores of primary school students in Peninsular Malaysia. The multiple regression results of his study indicated that the main contributors to achievement were the socio-economic status and locus of control variables. He suggested that the Malaysian education authorities should look deeper into the influence of the locus-of-control orientation in finding ways to improve educational attainment.

Maznah Ismail and Foong (1984) examined the relationship between Malaysian children's perception of locus of control and their achievement. Her sample consisted of 729 standard three pupils (406 boys, 323 girls) attending primary schools in the rural areas in Peninsular Malaysia. She found that her results of correlation analyses generally supported previous studies revealing that students scoring as 'high internals' tended to perform better academically than those scoring as 'low internals'. She, also, found that girls exceeded boys on both 'high internal' and 'low internal' which suggested that, more so than boys, girls in Malaysian culture are socialized to feel responsible for their success as well as for their future. She concluded that high school marks obtained by the girls appeared to be related to their greater sense of responsibility for the outcome of their performance.

2.2 Conceptualization of approaches and styles to learning

This conceptualization can be seen within the last two decades where more and more convincing descriptions of students' learning have appeared. There has been a drastic change in emphasis; learning processes are now studied in terms of approaches, styles or strategies which students use to master specific subject-matter. Thus, the use of theories of learning strategies or styles has received much attention in the current literature as a means to promote learning. The contrasting approaches to learning have been expounded by such researchers as Marton and Saljo (1976a,b), Marton *et al.* (1984), Biggs (1970, 1978, 1979, 1987), and Entwistle (1988). They have broken away from traditional research and have attempted to explore the different ways in which students tackle realistically complex learning situations - the daily classroom realities.

The seminal work of Marton and Saljo (1976a,b) posited qualitative distinctions between approaches to learning and illuminated, at an individual level (within a phenomenographical perspective), their association with perceptions of certain aspects of learning the context, especially perceived requirements for assessment related to specific learning tasks. They noted that the associations were essentially between qualitatively different approaches

to learning and perceptions of academic *assessment* procedures.

Biggs (1979) in Australia, also, made a similar analysis to that which had been proposed by Marton and Saljo (1976a,b) with the aim of developing an inventory for assessing students' approaches to learning in association with motivation. His first inventory (Biggs, 1970) was called the 'Study Behaviour Questionnaire', but later it was revised and re-labelled the 'Study Processes Questionnaire' (Biggs, 1979). Biggs (1979) indicated that his most recent work strongly suggested the existence of three main factors: *utilizing*, *internalizing*, and *achieving* - each of which contained both a cognitive and a motivational component. The first, '*utilizing*', includes a "fact-rote" cognitive strategy and an "extrinsic", "fear of failure" motivational component. The second factor, '*internalizing*', contains a "meaning-assimilation" cognitive component and an "intrinsic" source of motivation. The last factor, '*achieving*', has study skills and organization as cognitive components and "need for achievement" as a source of motivation. Biggs' outcome-based measure is called the 'Structure of the Observed Learning Outcome (SOLO)'. In 1979 Biggs also studied the relationship between his Study Processes Questionnaire and SOLO. He found that the utilizing individual would, presumably, be a shallow-level (or Marton's surface-level) processor while

an internalizing individual would be a deep-level processor. Biggs (1979) was surprised that students with an 'achieving' orientation demonstrated a shallow learning outcome even under conditions that should have encouraged a deep-level approach to learning.

According to Entwistle, Hounsell, and Hanley (1979) the main weakness, from an educational standard-point, of most educational psychology research on learning in the past (apart from Marton, Pask and Biggs) has been that it relates to trivial and artificial subject-matter such as experiments with animals in a laboratory or clinical experiments. The psychometricians were interested solely in human learning and looked for explanations of differences in learning in terms of intelligence and personality. Cognitive psychologists have also concentrated on human learning with a focus on how information is processed, stored and retrieved. According to Entwistle (1987a), all these researchers have treated the activities of learning as happening to other people or even other organisms; they have not asked the learners themselves how they go about day-to-day classroom learning. All these past theorists, according to Entwistle (1985), have captured an aspect of human learning of continuing importance, but none of them has given an adequate description of learning in the classroom. Entwistle (1981) has also drawn attention to the fact that some of the results and theories of the past

researches might have been impressive in their internal coherence, but much less convincing in their value to real-life learning. He added that such researches often lack ecological validity. Only recently has the new direction in educational psychology, seeking theories with a narrower "ecologicical validity", been widely recognised. These have been derived from specific environments and are intended to describe events only within those environments. As we can see the present and future trends of educational psychology research on learning are tending towards making use of realistically complex materials which develop explanations directly from the learner's own experiences in their learning institutions - be it school or university.

Schmeck (1983), also, found that most of the early educational research has been traditionally concerned with cognitive processing, individual differences and learning using traditional personality, attitudinal and ability measures in assessing students' learning and students' motivation which were not definitive. This lack of clarity prompted Tallmadge and Shearer (1971) to state that 'learning style' would be a more useful concept than traditional personality and cognitive style constructs in contributing to the variance in academic performance. They further stressed the need to assess learning style from a behaviour-process orientation.

2.3 Theory of Individual Differences

In the past, cognitive psychologists tended to develop theories about the processes and machanisms that are common to all individuals. Their theories have typically shown very little interest in studying differences between individuals in term of underlying cognitive function. They just ignored the possibility of development and change occurring within individuals over the course of time (Entwistle and Hounsell, 1975). But gradually, psychologists began to accept the ultimate uniqueness of the individual:

> Every man is in certain respects (a) like other man, (b) like some other man, and (c) like no other man.
> (Entwistle, 1988 :10)

> Even students in the same classroom may differ in the degree to which they focus on certain cues, as well as how they interpret them.
> (Ames and Archer, 1988 :260).

Two related theories of Pask (1976a, 1976b, 1988) and Kozeki (1985) on individual differences concerning why some pupils learn faster and more easily than others or what actually happens in a particular individual in learning, will be discussed in this section.

Gordon Pask and his colleagues in London have constructed extensive experimental research concerning learning styles. In several studies (mostly laboratory

studies), Pask and Scott (1972, 1973) have shown how the individual learner comes to master principles of classification with complex subject matter. Pask (1976a, 1976b) later developed what he calls a "conversational" theory of learning, although Entwistle (1988) classifies Pask's work under 'individual differences' theory. Pask's theory describes the ways in which a student tackles a task which requires understanding, how a student works his way towards a full understanding of a topic by questioning, or trying out his ideas on either a teacher or an 'alter-ego', another part of the mind which monitors and interacts during the learning process. From various experiments, Pask and his colleagues have distinguished two distinctive styles of learning - 'holist' and 'serialist', which represent consistent preferences for using certain learning processes.

Serialist learners, who prefer 'operational learning' style, are routinely concerned with operational details and procedures and tend to progress on localised, step by step basis, by attending carefully to sequential details. In other words, they focus on 'the facet of learning process concerned with mastering procedural details'. On the other hand, *holist* learners manifest the style called 'comprehension learning'. Unlike the operational style, the comprehensional style involves 'building descriptions of what is known' (Entwistle and Ramsden, 1983). The use of

illustrations, analogies, and anecdotes seems to be an essential part of holist learning. These learners progress in a more global approach assimilating information on a wider range of topics and use analogies to arrive at an overall description, through visual imagery and personal experiences to build up understanding.

In Pask and Scott's (1972:218) word:

> Serialists learn, remember and recapitulate a body of information in terms of string-like cognitive structures where items are related by simple data links..... Holists, on the other hand, learn, remember and recapitulate as a whole.

Subsequently, Pask (1976a) suggested that holism and serialism were 'extreme manifestations of more fundamental processes':

> Some students are disposed to act 'like holists' (comprehension learners) and others 'like serialists' (operation learners), with more or less success. There are also students able to act in either way, depending upon the subject matter, and if they excel in both pursuits, we refer to those students as *versatile*. It is these distinctions which can, more appropriately, be referred to as learning style. (p.133).

Entwistle (1988) noted that holist styles are more suitable for learning in the humanities, and serialist styles in the science. But for many tasks, particularly in science, elements of both styles are required, what Pask (1976a) called "*versatile*", meaning that they were equally

comfortable with either holist or serialist styles and used each as appropriate.

According to Pask (1976b), 'globetrotting' students are those who show marked over-reliance on one or other of the styles. Such students show characteristic "pathologies of learning". Students using an unbalanced holist style leads them to a search for similarities between ideas without recognising important differences, to use inappropriate analogies, to generalise from inadequate evidence, and to jump to conclusions too readily. An unbalanced serialist style often takes no notice of important similarities, but instead considers relatively trivial differences. They fail to use appropriate analogies and are reluctant to reach independent conclusions or to make personal interpretations of evidence. Thus, Pask called this pathology 'improvidence'. Pask (1976b) describes the most competent student as the one who has a versatile learning style. According to the author, the versatile student uses a higher-order metacognitive strategy based on both the serialist and holist strategies. Therefore, a versatile learning style leads to a very high level of understanding.

Kozeki of Hungary (Entwistle and Kozeki, 1983,1984, 1985 and 1988; Kozeki, 1985) is another theorist who takes into account the importance of individual differences

although his work seems firmly rooted in behaviourist principles. Kozeki concentrated on studying, over a period of ten years, one particular research area of individual differences, that of motivation. In fact, an integrated approach to school motivation (the School Motivation Inventory) was reported, in considerable detail by Kozeki, but published in Hungarian, a language not familiar to fellow researchers, and thus, only some short summaries were available in English (Kozeki and Entwistle, 1983).

According to Kozeki and Entwistle (1983), Kozeki conducted a series of studies in several Eastern European countries which were designed to establish the basic motives and the most common motivational patterns shown by school children. Since then, Kozeki has been attempting to identify a set of motivational dimensions which have a sound theoretical rationale and are, also, rooted in the daily experiences of pupils, teachers, and parents. Previous research in Britain and USA, according to Kozeki and Entwistle (1984), indicated that motivation in education has several dimensions. An early distinction was between extrinsic motivation, in which the rewards were sought in marks or qualifications, and intrinsic motivation arising out of interest in the subject matter being learned. Then the concept "competence" was introduced - the satisfaction derived from doing something well. Achievement motivation, as mentioned earlier, describes

rewards from competitive success - the boost to self-confidence from doing something better than others. According to Birney *et al.* (1969), alongside achievement motivation, or "hope for success", comes "fear of failure", the fear of doing badly and being criticised, which pushes some pupils to work harder. Birney and associates (1969) suggested that this form of motivation is rooted in general anxiety and is at its strongest in competitive achievement situations.

Entwistle (1988:21) argued that "*most of descriptions of learning motivation describe rewards or punishments in cognitive terms, but recent research in Hungary by Kozeki has sought to remind us that there are emotional and moral, as well as cognitive, sources of satisfaction in schooling*".

Kozeki's (1985) research was based on the initial assumption, later amply justified, that children's motivational styles are firmly rooted in their relationships with 'significant others' particularly with their parents, teachers and close friends (peer groups). Entwistle and Kozeki (1985) argued that we do things because it is important to us that we appear favourably in the eyes of significant others, such as parents, teachers, peer group and later with employers, civic authorities and so on. According to Biggs (1987), this 'social'

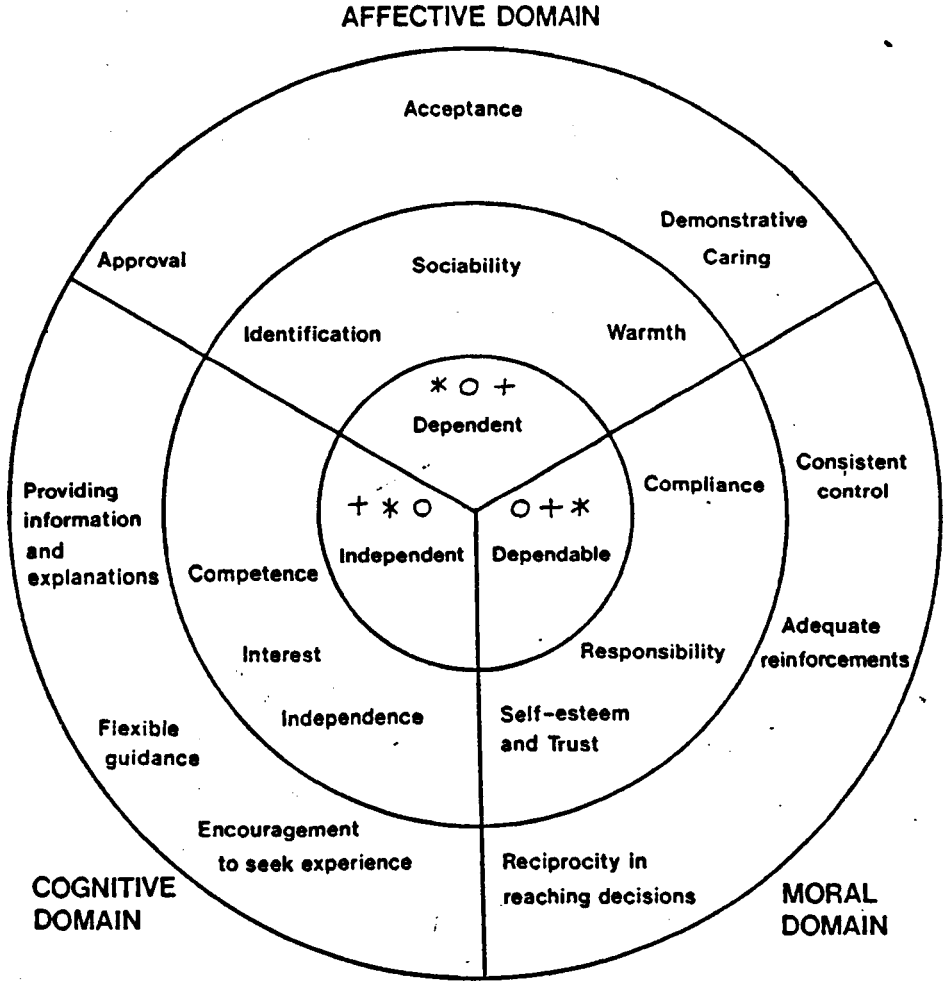
reinforcement is different from 'material' reinforcement in that the 'reward' is non-material; its value depends on the relationships between children and parents, pupils and teachers, and an individual and his peer group (or other reinforcing agent). Praise, from someone admired by the child, helps the child to internalise and to feel proprietorial about learning. On the other hand, material reinforcement is impersonal and has less effect on the student's feelings of competence.

Entwistle and Kozeki (1983) suggested that there are nine separate motives within three main motivational areas or domains - *'affective'*, *'cognitive'*, and *'moral'* as sources of satisfaction in schooling. After doing factor analyses of items in their various studies, Kozeki (1985) suggests that the nine motives in relation to 'school motivation', revealed in Table 2.1 could be classified into six factors, equally divided between the affective, cognitive, and moral domains as follows: emotional warmth , sociability, competence, interest, responsibility and compliance . In his latest model, identification, independence and trust or self-esteem merged. Table 2.1 and Figure 2A summarise the ways in which Kozeki suggested parents and teachers affect pupils' motivation towards school.

Table 2.1 Kozeki's Nine Motivational Categories
(adopted from Kozeki & Entwistle, 1984 page 308; Kozeki, 1985 page 191)

DOMAINS	*LABEL*	*DESCRIPTION OF MAIN SOURCES OF MOTIVATION*	*MAIN SOURCE OF REINFORCEMENT*
1. Affective	1.Warmth	Encouragement and interest actively shown by parents	Relationships with parents
	2.Identification	Feeling empathy with adults and wanting to please them	Teachers
	3.Sociability	Enjoying collaborative work and activities with peers	Peers
2.Cognitive	4.Independence	Satisfaction from working things out without help from others	Relationships with parents
	5.Competence	Rewards from a recognition of developing knowledge and skills	Teachers
	6.Interest	Enjoyment derived from ideas	Peers
3.Moral	7.Trust and self-esteem	Satisfaction from doing things thoroughly and well	Relationships with parents
	8.Compliance	Preferring the security of behaving according to defined rules or norms	Teachers
	9.Responsibility	Accepting the consequences of actions and monitoring own behaviour accordingly	Peers

FIGURE 2A
A Model Relating Sources of Motives to Motivational Styles
(adapted from Kozeki, 1985: 198)



Key:	
Outer circle:	behaviour of parents or teachers;
Inner circle:	motives;
Centre:	most successful motivational styles.

The first domain, the affective, which depends essentially on relationships with others, describes values, emotional and social forms of reinforcement. The relationship between children and parents, in the early stages of life, establishes one strong and continuing motivation. The rewards provided by pleasing parents are in the form of "*warmth*" expressions, of tender caring and loving sentiments. As children grow up, they need ensurance of adult approval and, thus, reinforce their "indentification" with parents and, later with teachers, who become secondary sources of motivation. Once their social network extends by having more and more friends and approval from peers, this, also, becomes increasingly important with rewards arising from acceptance by friends. This latter motivational category is referred to as "*sociability*".

According to Kozeki (1985), pupils who have high scores in the affective domain establish a warm reciprocal relationship with others, so as to earn respect, liking and praise for their diligence and reliability, but their basic motivation is "*fear of failure*". Such a pupil is likely to be rather dependent and to be a passive follower, who is likely to be seen as a conformist. Kozeki suggests that if strong affiliative motive is not supported by responsibility, the pupil may want to solve everything by relying on personal relationships and so become anxious, over-dependent, even hypocritical and insincere. Kozeki,

also, argues that parents and teachers who showed unconditional love and support are likely to develop in children an over-dependence on personal relationships, leaving them anxious and uncertain of their own capabilities. Thus, if a child is emotionally dependent, according to Kozeki, it would make sense to encourage responsibility through encouraging greater autonomy in, for example, taking decisions.

The second domain of motivation, the cognitive, which depends on developing competences in knowledge and skills, thus, comes from cognitive reinforcement. As children develop and become adolescents, the demand for autonomy and "*independence*" from parents increase. The sense of freedom, doing and achieving something in their own way; freedom to make their own choice of an activity and freedom to proceed at their own pace, thus, become their priorities. Children are always anxious to know and to extend their mastery over their environment through acquiring knowledge and skills (cognitive learning). This motivational category is referred to as "*competence*". Once the children are 'keen' and know or do things, naturally they will 'like' them and, thus, come to be of "*interest*" to them. These are the rewards of self-expression which represent the final cognitive dimension in Kozeki's model. In this sense, interests are common to everybody, although interests can be local - a child living along the Saribas river in

Sarawak may have a strong interest in swimming in the river but a correspondingly strong aversion to crocodiles, whereas such an interest is meaningless to a child in Hull, who has never gone into the river Humber as it is outside the boundary of his home region.

In Kozeki's theory, a pupil who has a positive cognitive domain is usually very creative and works very effectively, but if he lacks any strong moral dimension he may tend towards selfishness and non-conformity. With such a strong motivation towards competence if he, also, has the supporting strength of affiliation he may develop the need for applause. According to Kozeki, this pupil is sociable, but not warm: the need is to be popular rather than friendly and if affiliative needs diminish, ruthlessness or aggression is likely to increase in his behaviour. Thus, a strong reliance on reward or punishment in the cognitive domain may produce excessive competitiveness and rivalry.

The third or the last domain, the moral, consists of rewards derived from personal and social responsiveness. It depends on the feelings of satisfaction derived from living up to expectations of self and others. Kozeki reminds us that living up to the trust of others develops "*self-esteem*" and "*trust*" as a form of control is internalised in the conscience from the previous actions of parents,

teachers and friends. "*Compliance*" which is the next motive in this domain, reflects the controlling influence of religious beliefs, accepted social norms and higher-order moral values which give satisfaction. Finally, when their internalized standards of behaviour are accepted, pupils will develop and enjoy personal "*responsibility*". In other words, this pupil is achievement-oriented but not success-oriented. Kozeki sees this pupil as emotionally independent of others (independent-minded), and responsible rather than compliant. The strong moral motives imply not only interest in academic work but also in doing well and living up to what is expected. He added,

> ...overemphasis on the moral domain might lead to apathetic compliance in some cases or in others a form of fanaticism (believing absolutely in a particular code of conduct and trying to impose it on others).
>
> (Kozeki, 1985:196).

2.4 Theory of Experiental Learning

Marton and his colleagues (1976a,b) at the University of Gothenburg, Sweden, conducted a series of studies concerning the approaches students adopt in the everyday task of reading academic articles. Their studies, or sometimes refer as the Gothenburg studies, focused on ways in which students read and learn typical prescribed materials in a situation where that learning is assessed. Marton limited his research methodology to qualitative

analyses of small samples of mainly social science students. He, also, criticised previous research on prose learning, as being too preoccupied with the quantitative outcome of learning, such as, the number of facts and ideas that have been remembered and so on.

Following on from the work by Marton and Saljo (1976a,b), a large-scale investigation into student learning, undertaken by Entwistle and Ramsden (1983), provided further tangible evidence of the association between student perceptions of the learning context and approaches to learning at both an individual and group level. At group level, their conclusions (supported by statistical and interview data) were that qualitatively different study orientations were associated with certain aspects of departmental learning contexts; the **"meaning orientation"** was related to the perceived presence of freedom of choice in learning combined with good teaching in the department, while the **"reproducing orientation"** was strongly related to a heavy workload and a lack of freedom in learning. At an *individual* level (based on interview data) they also further illuminated the important association between "surface approach" and methods of assessment.

Entwistle and Ramsden (1983) agreed that those qualitative aspects of students' understanding, of what they have read, have been ignored. Marton and Saljo's

(1976b) analysis of transcriptions of interviews revealed two general types of learning outcome: 'conclusion-oriented' and 'description-oriented'. The conclusion-oriented outcome resulted when the students' intent was to understand and when a "deep approach" was employed. Entwistle (1988) suggested that perhaps the most crucial discovery of the Gothenburg studies was that the processes used depended on the intentions of the students.

With a "deep approach" the intention is to 'understand' the meaning of the article. This intention generally leads to a lively interaction with the content of the article, relating it to previous knowledge, other topics, and personal experience. Marton and Saljo (1976a) suggested that the deep-level approach involves an active attempt by the student to understand the author's meaning, an evaluation of the relationship between the argument and the evidence and an attempt to relate the ideas, content of the article, other topics, and previous knowledge to a student's personal experiential experience. Thus, Entwistle (1988) considers Marton to be an experiential theorist.

The description-oriented outcome is a listing of the main points covered in the article, thus adopting a "*surface approach*". With a surface-level approach, in contrast, the intention is limited to completing the task

requirements. The surface-level approach focuses attention on the specific facts and pieces of disconnected information. Once that information is identified, it is memorised by repetition and rote learning. Thus, the student intends to carry out task requirements in a mechanical way without relating them to previous knowledge or personal experience. Svensson (1976) uses the terms "holistic approach" and "atomistic approach" for "deep approach" and "surface approach", respectively. In the forthcoming paragraph we will find the third approach to learning, a "strategic approach" to learning suggested by Entwistle and Ramsden (1983). They indicated that a "strategic approach" is the use of both "deep" and "surface" approaches to learning.

2.5 The Interactionist Theory

Entwistle and his colleagues at the University of Lancaster and later at Edinburgh, United Kingdom, began their first five-year research programme in 1968 and followed this by the construction of a series of inventories, the so called 'Approaches to Studying Inventory' or 'ASI' (Entwistle and Wilson, 1970 & 1977; Entwistle and Entwistle, 1970; Entwistle, Thompson and Wilson, 1974) with the aim of identifying the objectives of higher education and isolating students' personality and motivational differences that would predict academic

performance. In other words, they sought to identify the factors associated with academic success and failure of university students. According to Entwistle (1988), the previous studies explored the contributions made by school attainment, verbal and mathematical aptitudes, personality, work habits, motivation and study methods, using multivariate analyses of psychometric measures and examination grades.

Entwistle (1984) noted that their second five-year research programme, which started in 1981, has changed direction, being influenced by the work of both Marton's research group and that of Gordon Pask and his colleagues. As mentioned earlier, the Lancaster research group introduced a third category - a "strategic" approach, apart from the Marton's two main categories. In a "strategic approach" to learning, a student intends to get the best grades possible by being well-organized, making effective use of time, seeking out appropriate working conditions, and being alert to what type of work is rewarded most by individual teachers. Instead of using Marton's terms of 'conclusion-oriented' and 'description-oriented' to describe the types of learning outcomes, the Lancaster research group replaces them with "meaning" and "reproducing" orientations, respectively, and adds another one - the "achieving" orientation. The term "orientation" was used to indicate a combination of approaches to

learning (learning process) with motivation, as shown in Figure 2B, which is relatively stable across different educational tasks (Entwistle and Ramsden, 1983). According to Entwistle *et al.* (1979), each of their three orientations involves a different source of motivation.

The first of these three, "***meaning orientation***" or search for personal understanding, brought together deep approach and holist style (the use of a broad focus in learning, making use of a wide variety of information, such as analogies and real-world experience; see Pask, 1988) with intrinsic motivation and also hope for success. This student is somewhat autonomous and independent of course syllabi. In the "***reproducing orientation***" or memorization, surface approach went with serialist style (a narrow, cautious stance relying on evidence or logical analysis) and was linked with fear of failure, supported by instrumental, extrinsic or vocational motivation. Such a student is dependent on course syllabi and prone to memorize information verbatim. Finally, the "***achieving orientation***" or doing whatever is necessary to earn high grades, was governed by a strategic approach (indicated by the use of both deep and surface approaches) which was associated mainly with a competitive form of motivation (need for achievement or hope for success) and vocational or instrumental motivation. The achieving student is said to be "stable, self- confident, and ruthless."

Figure 2B- SUB-SCALES OF LEARNING APPROACHES

(adapted from Entwistle and Ramsden,1983: 42).

ORIENTATION	*APPROACH or STYLE*	*MOTIVATION*
Meaning	Deep Approach/ Holist Style.	Intrinsic
Reproducing	Surface Approach/ Serialist Style.	Fear of Failure, Instrumental.
Achieving	Strategic Approach	Hope for Success, Conscientiousness.

Table 2.2 gives the defining features of these approaches to learning. The "deep" approach can be simplified as one having an intention to seek 'understanding'; the "surface" approach depends on 'reproducing' what is taught and required by the teacher; whereas the "strategic" approach involves the intention to 'maximize grades', partly by systematic management of time, effort, and study condition (Entwistle, 1987b). As he has pointed out, the "strategic" approach used by the student depends on what he believes will produce the best 'pay-off'. In the school version, according to Entwistle and Ramsden (1983), the meaning of "strategic approach" has been changed slightly from the original one used on university students at Lancaster. They noted that in the school version, the "strategic approach" was less

consistent. As students have little opportunity for strategic learning in school, it no longer implied 'cue-seeking' but consisted of a strategic use of time and effort in carrying out school work. In using his model, Entwistle (1988) reminds us that:

> It would be wrong to give the impression that students can be categorised as 'deep' or 'surface'. Their approaches vary to some extent from task to task and from teacher to teacher. It is the approach which is categorised, not the students.
> (Entwistle, 1988:61).

TABLE 2.2 Defining Features of Learning Approaches

(from Entwistle, 1987b:16).

DEEP APPROACH

- Intention to understand
- Vigorous interaction with content

HOLIST STYLE (Comprehension Learning)

- Relate new ideas to previous knowledge
- Relate concepts to everyday experience

SERIALIST STYLE (Operation Learning)

- Relate evidence to conclusions
- Examine the logic of the argument

SURFACE APPROACH

- Intention to complete task requirement
- Memorize information needed for assessments
- Failure to distinguish principles from examples
- Treat task as an external imposition
- Focus on discrete elements without integration
- Unreflectiveness about purpose or strategies

STRATEGIC APPROACH

- Intention to obtain highest possible grades
- Organize time and distribute effort to greatest effect
- Ensure conditions and materials for studying appropriately
- Use previous exam papers to predict questions
- Be alert to cues about marking schemes.

Entwistle (1988), himself, claims to be an interactionist. According to Tomlinson (1985), an interactionist theory or approach may be summarised in the view that "effective teaching depends not just on any single factor, but on the interplay (interaction) of many features in the teaching situation". The situations he included here were the nature of the topic, kind of strategy used, age, ability, motivation, previous experience of the pupils, available resources, aspects of the teacher and so on. Thus, in this interactionist theory, both the characteristics of the learner and the educational context are given equal prominence.

The relationship between school or academic motivation and scholastic success is well established, but recently Entwistle and his colleagues have suggested that differing types of motivation interact with characteristically different ways or approaches to learning (Entwistle *et al.*, 1974; Biggs, 1978, 1979). According to Entwistle and Ramsden (1983), the earlier study by the Lancaster group had already pointed up how *'hope for success'* and *'fear of failure'* were associated with different ways of learning. Later, Entwistle, who is very much influenced by Marton's, Pask's and Biggs' models, combined and inter-related their factors into a recent inventory: these factors are presented in Table 2.3.

TABLE 2.3

Summary of Orientations, Learning Approaches, Styles and Motivation Features

Constructs	Meaning Orientation	Reproducing Orientation	Achieving Orientation
Approaches to Learning (Marton)	[1] Deep - students intends to understand and make active attempts to relate new ideas to previous knowledge or real life experience, and to adopt an independent and critical stance towards knowledge.	[4] Surface - student intends to carry out task requirements in a mechanical way without personal involvement, tries to identify discrete 'bits' of knowledge to memorize, and is over-reliant on the teacher to provide a framework within which to learn and study	[8] Strategic - students intend to get the best grades possible by being well-organized, making effective use of time, seeking out appropriate working conditions, and being alert to what type of work is most rewards by individual teachers.
Styles of Learning (Pask)	[2] Holist - concentrates initially on a broad view of the topic, learns best by making use of analogies and illustrations, prefers anecdotal personalized teaching; tends to generalise too readily and reach conclusions on inadequate evidence.	[5] Serialist - concentrates initially on facts, details, and on the logical interconnections between 'bits' of knowledge or steps in the argument, learns best when knowledge is presented formally with a clear structure; tends to miss important links between ideas or between subject areas.	
Associated Motivation (Biggs and Entwistle)	[3] Intrinsic - interested in the subject matter itself, is excited by academic topics and intellectual ideals.	[6] Instrumental- interested in the qualifications and their vocational and economic opportunities, or works only because of external pressures. [7] Fear of Failure - anticipates the punishment of failure, irrespective of previous successes, and worries about being behind with work or doing worse than others.	[9] Hope for Success - competitive, determined to do better than others so as to maintain a high level of self-esteem. [10] Conscientiousness- determination to carry out what is expected as well as possible, even if it interferes with more immediately pleasurable activities.

Entwistle and Kozeki (1985, 1988) combined the already available 'School Motivation Inventory' and the 'Approaches to Studying Inventory' to form the 'School and School Work Inventory', which is used in the present study. This new combination inventory contains aspects of both school motivation and learning approaches. They identify 20 sub-scales as presented in Tables 2.1 and 2.3, which bring together the influences on learning of pupil's own characteristics as well as those of parents, peers, teachers and school.

There is considerable evidence of relationship between learning approach and achievement. For example Ramsden and Entwistle (1981) in a large-scale study in British universities and Watkins (1982) in a study of first-year Australian university students have shown that a deep approach is accompanied by higher academic achievement than for those who follow a surface approach. Marton and Saljo (1976a,b), in Sweden, found an over-reliance on surface learning leads to poor tertiary achievement. Similar results were obtained by Svenssen (1977) and Schmeck and Grove (1979). More recently Van Rossum and Schnenk (1984) in Netherlands and Watkins (1983) in Australia have found similar relationships.

In the Third World, Watkins *et al.* (1982) found positive correlation between deep-level processes (deep

approach) and grade achievement among final-year school students in the central Philippines. Wilson (1987) found that science foundation students at the University of Papua New Guinea score much higher on a deep learning approach than do their Australian counterparts, but their academic achievement do not correlate with this learning approach's scores. One study in the Malaysian context, that could be traced, is the work of Gan (1984). He found significant positive correlation between science achievement and study process (deep-level process) for 17-year-old Malaysian school students, as measured by the Biggs' Study Process Questionnaire. The present study, although similar to Gan's (1984) as to the sample used (Form V students at the age of 17), uses the most recently devised instrument - School and School Work Inventory, and two other instruments which measure students' degrees of locus of control and optimism.

2.6 Conceptualization of Optimism in Learning

Many theorists have argued that a sense of personal control over one's life is central to psychological adjustment (e.g. Abramson *et al., 1978; Bandura, 1982; Taylor, 1983). More recently, Carver and Scheier (1985) noted that confidence or lack of confidence in reaching successful goal attainment (optimism/ pessimism) is a major determinant of effective coping and successful*

performance. In general terms, "optimists are people who generally expect things to work out well, *pessimists* are people who expect things to go from bad to worse" (Carver and Scheier, 1988: 329). Marshall and Lang (1990: 132), further defined '*optimism*' as reflecting one's expectations "to the conviction that the future holds desirable outcomes irrespective of one's personal ability to control those outcomes. A sense of *optimism* may be derived from multiple external and internal sources including luck and the assistance of others as well as personal mastery".

Carver and Scheier (1988) proposed that adjustment stems not from a sence of one's personal mastery over outcomes *per se*, but from the more general expectation that the likely occurrence of future desirable outcomes is high. In their general self-regulation behavioural theory, Carver and Scheier (1988), noted that optimists adopted an active, problem focused coping style aimed at resolving the difficulties that they were encounting; and reported a suppression of focusing on those activities that competed for their attention so that they could concentrate more on the particular problem at hand. Thus, Carver and Scheier (1988), also, outlined three salient features of the effects of optimist (confidence) and pessimist (doubt): People who have favourable expectancies continue to focus on task efforts, whereas, people who have unfavourable expectancies have a tendency to disengage from attempts at

goal attainment and, also, tend to become mired in their distress.

Carver and Scheier (1985) examined illness symptoms experienced by college students during the last four weeks of the academic semester because it was assumed that students during that period were under a fair amount of pressure trying to complete their remaining course work and prepare for final exams as best they could. The authors found that high levels of optimism were associated with low levels of symptoms. Of far greater importance, they noted, was that optimism proved to be a reliable *prospective predictor of symptoms over the four-week period, even after controlling for initial symptom levels.* Thus, relative optimism apparently served as a buffer against the ill effects of stress.

According to Carver and Scheier (1987), an optimist tends to use a strategy of "acceptance" (acceptance of the reality of the situation), but only in the very circumstance in which his stressful situation is appraised uncontrollable. Pessimist, on the other hand, tends to engage in a "denial" strategy (distancing, too easily to come to resignation). They suggest that optimism may confer a coping advantage not only when something can be done to deal with the stressful event, but also when the event is something that must be accepted and to which the person

must accommodate. The tendency to rely on "acceptance" rather than certain other emotional-based strategies such as "denial" may thus facilitate adjustment to a host of life difficulties such as terminal illness or long-term physical impairment. Suls and Fletcher (1985), in their meta-analytic findings, reported that denial is associated with poor long-term coping outcomes. They suggested that optimism bestows benefits in this kind of situation, as well as in situations where the cause of the difficulties is more easily rectified.

Most of the previous researches on optimism versus pessimism focussed on medical and psychological fields (see Reker and Wong, 1985; Scheier *et al.*, 1986; Van Treuren and Hull, 1986) and not much interest was focussed on the educational field. Carver and Scheier (1988: 325) urged that "though the theory does not derive from research on educational process, we believe that its principles have potential application....to developing ways to optimize educational outcomes for the world's children".

Of course, a student may hold optimistic expectancies for any number of reasons because he possesses natural ability, special talents and innate skills; because he is confident of his own abilities; and because he has the opportunities to seek qualifications leading to success in later life. Thus, the inference is that an "optimist" is

likely to be a high achiever, a self-confident individual with a positive self-esteem, possibly motivated by success resulting from his own efforts ("internal" locus of control) who will tend to adopt either a "deep" or a "strategic" approach to learning. The present study aims to explore the relationships between the construct "optimism" and these other variables to discover whether or not such a description of an optimist, as pictured above, does in fact exist.

2.7 Conceptualization of Gender Differences In Learning

"Sex" and "gender", according to Sara Delamont (1990), are closely linked concepts which are frequently used in a confusing way.

> *Sex* should properly refer to the biological aspects of male and female existence. Sex differences should therefore only be used to refer to physiology, anatomy, genetics, hormones and so forth. *Gender* should properly be used to refer to all the non-biological aspects of differences between males and females: clothes, interests, attitudes, behaviours and aptitudes, for example, which separate 'masculine' from 'feminine' life styles.
>
> (Delamont, 1990: 7).

Thus, *gender* is more appropriate in this study because the roles students play in school are essentially related not to biology, but to social behaviour.

Block (1984) suggested that gender differences in personality development can be attributed to one of the

three factors: (1) gender differences in cognitive abilities; (2) gender differences in biological maturation; and (3) gender differences in socialization experiences. It is suggested that the present study may adopt these three categories with the aims to explore gender differences in academic achievement in each subject area (cognitive abilities) and to discover the relationships between girls and boys and the predictive variables such as "fear of failure", "intrinsic motivation", "hope for success", "conscientiousness", "competence", "interest", "optimism", "responsibility" and "warmth" (biological maturation); "sociability", "instrumental motivation", "compliance" and "locus of control" (socialization experiences).

Gender differences in cognitive abilities

The issue of female underachievement, particularly in science, has received much attention in recent research. The most extensive data on gender differences in science achievement have come from the cross-cultural survey of science achievement within 19 countries done by the International Association for the Evaluation of Education Achievement (IEA) (Comber and Keeves, 1973). With very few exceptions, differences between the average achievement scores of boys and girls in science were apparent with most of the differences in the boys' favour. Comber and Keeves (1973) noted that, in virtually all countries from which data are available, boys showed better achievement than

girls in physics, yet in the biological sciences the boys' advantage has been less apparent and typically small. Out of 19 Western Countries in the IEA study, one country which showed contrary to the usual pattern was a study in Poland, as reported by Erickson and Erickson (1984), undertaken by Hnilicova-Fenclova (1974), whereby, she found that her Polish sample showed little difference between the scores of the boys and the girls in physics.

Walker (1976) has reported from the IEA on gender differences in other subject areas. At both the 14-year-old and the pre-university levels and in all countries the boys did less well, and also showed less interest in Literature. In the learning of English as a foreign language, the boys scored below the girls on both the reading and the listening tests, but the differences were small. He suggested these differences are related to the sex-role expectations of the societies in which these young people are undertaking their secondary schooling.

Methen and Wilkinson (1988) who explored the relationships between gender and achievement of Kuwaiti students, found that girls attained significantly superior results compared with boys in all science subjects and, thus, contradict the research findings of similar studies undertaken in Western Countries (Comber and Keeves, 1973). Methen and Wilkinson (1988), also, found that boys in rural

schools achieved significantly better mean scores than those in urban schools in biology, chemistry and physics but not in either geology or mathematics. In contrast, girls in urban schools attained superior mean scores to those in rural schools in all subjects. They suggested that differences in performance between girls and boys are more likely to arise as a result of differences in values and expectations that are imposed by society.

In the United States, the large-scale national surveys of science achievement undertaken by Project TALENT (Shaycroft *et al.*, 1963) and the National Assessment of Educational Progress (NAEP), as reported by Erickson and Erickson (1984), provide further evidence that girls score below boys in test of science achievement. Maccoby (1966), also, reported that in the United States boys generally show stronger numerical and spatial abilities and perform better on tests of mathematical reasoning than girls, but girls usually do better in verbal and linguistic studies.

Vetter (1976) found that achievement levels of girls and women in science are considerably below that of male counterparts, especially in post-secondary enrolment and employment in scientific occupations. Vetter (1980), also, noted that mathematics-related post-secondary school educational options and mathematics-related careers are chosen less often by women than by men. Fox (1980) and

Fennema (1984) found that females in fourth grade and in high schools, respectively, often feel less confident in learning mathematics than their male counterparts.

Gender differences in biological maturation

According to Cohn (1991) the differences in biological maturity are more revealing than cognitive abilities because girls enter puberty approximately 2 years earlier than boys, beginning around age 11, the time that gender differences in ego development begin to be observed. Thus, as suggested by Cohn (1991: 262), "psychological maturity accompanies physiological maturity". Simmons and Blyth (1987) argued that early developing girls may have most difficulty in adapting to puberty, whereas early developing boys may show the fewest problems.

Tomi-Ann Roberts (1991: 298) also reveals a common stereotype of women:

> that women look to others for evidence of their competence more than men, and are more sensitive to the evaluations they receive from others. This vulnerability to others' evaluations is often considered maladaptive, because it leads women to be overly dependent on others' approval rather than relying on their own internal standards.

> ...the tendency to be overly reactive to the opinions of others can undermine one's sense of competence and can lead to depressive symptoms such as low motivation, pessimism, and passivity.
> (Rehm, 1977: 231).

There are also numerous studies which indicate that girls tend to show decreased achievement strivings under conditions of failure, and tend to blame their bad luck (external locus of control) for poor performance. Boys, in contrast, have more internal standards for excellence (internal locus of control), often show improvements in performance after failure and are less influenced by the reactions of evaluators. Thus, they attribute their failure to their own poor effort rather than bad luck (Crandall *et al.*,1964; Crandall, 1969; Veroff, 1969; Nicholls, 1975).

Gender differences in socialization experiences

Gender differences in socialization experiences are not well documented beyond the common observation that girls are less aggressive and less egocentric than boys. Girls are typically portrayed as more mature than boys (Pitcher and Schultz, 1983), but Cohn (1991: 252) argues that "it is not known if this sex differences extends past early childhood". In his own most recent study, Cohn (1991) found that adolescent girls achieved personality development "milestones earlier than boys, a difference that declines with age" (p.252).

Terman (1946) reviewed similar findings from studies of nearly 5,800 students and concluded that girls are frequently portrayed as empathic, cooperative, and socially attuned, whereas boys are depicted as impulsive, aggressive, and egocentric. According to Terman (1946), even among children, girls have a reputation for greater maturity and are perceived by their peers as more altruistic than boys. This has been denied by Sheriffs and McKee (1975) who noted that, by adulthood (college students), males are no longer portrayed as the less mature sex. They suggested that, indeed, perceptions of maturity may actually undergo a reversal.

Lueptow (1984) and Ashmore *et al.* (1986), in their studies of gender stereotypes, cited that girls are commonly portrayed as affectionate, sensitive, sympathetic, warm, gentle, cheerful, shy, and submissive. In contrast, they noted that boys are pictured as aggressive, competitive, ambitious, dominant, rational, unemotional, independent, and self-confident.

2.8 Summary

The purpose of this chapter has been to examine some views of learning, motivation, locus of control, optimism and academic achievement, which, to some extent, relate to

and provide salient "guidance" to the present study. A variety of important and essential characteristics of learning approaches, learning styles, motivation, locus of control and optimism scales is hereby illustrated. Some of these are again looked at in Chapter III where the instruments used in the present study are discussed.

Prior discussions were based on Kozeki and Entwistle's (1985) learning and motivational dimensions, used in the present study, which have a sound theoretical rationale and are, also, rooted in the daily experiences of pupils, teachers and parents. Kozeki and Entwistle noted three learning approaches, two learning styles and eleven school motivations which relate to students' learning, and, to some extent, determine their achievement. A "deep approach" to learning (student intends to understand and make active attempts to relate new ideas to previous knowledge or real life) was in line with a "holist style" (the use of a broad focus in learning, making use of a wide variety of information, such as analogies and real-world experience). When this approach and style is combined with "intrinsic motivation" and "hope for success" a "meaning orientation" results (search for personal understanding), whereby, the student becomes somewhat autonomous and independent of course syllabi. The person who scores high on "deep approach" appears to be a calm and skilled critical thinker who can achieve in an academic setting either by following

instructions or by performing independently (Schmeck and Ribich, 1978). Thus, a "deep approach" to learning was reported to be related to a student's high achievement (Ramsden and Entwistle, 1981; Watkins, 1982; Svenssen, 1977; Schneck and Grove, 1979; Van Rossum and Schneck, 1984; Watkins *et al.*, 1982), and, in contrast, a "surface approach" to learning was associated with poor achievement (Marton and Saljo, 1976a,b).

A "surface approach" to learning (student intends to complete task requirement and relies on rote learning) was related to "serialist style" to learning (concentrates initially on facts and the logic of the argument but tends to miss important links between ideas or between subject areas). When this approach and style is combined with "fear of failure" and "instrumentlal motivation" a "reproducing orientation" results, whereby, such a student becomes dependent on course syllabi and is prone to memorize information verbatim.

A "strategic approach" to learning (student intends to get the best grades possible by being well-organized and making effective use of time) is indicated by the use of both "deep" and "surface" approaches, and, is associated with a competitive form of motivation "hope for success" and "instrumental motivation". A combination of these leads to an "achieving orientation" (doing whatever is necessary

to earn high grades). The achieving student is said to be "stable, self-confident, and ruthless", a salient factor leading to success.

The relationship between locus of control and scholastic success is, also, well established. It was reported that students with "internal" locus of control (person thinks of himself as being responsible for his own behaviour) tend to achieve higher than students with an "external" locus of control (people sees others, luck or circumstances beyond his control as responsible for his behaviour)(Fanelli, 1972; Heckhausen, 1977; Coleman *et al.*, 1966; Bar-Tal and Bar-Zohar, 1980; Stipek, 1981; Crandall, 1969; Maznah Ismail and Foong, 1984; Zainal, 1989). It would be interesting to see if "locus of control" in the present study has significant relationships with achievement and the selected students' variables.

Carver and Scheier (1988) noted that "optimism" (people who generally expect things to work out well) or "pessimism" (people who expect things to go from bad to worse) in reaching successful goal attainment is a major determinant of effective coping and successful performance. Most of the previous researches on optimism versus pessimism focussed on medical and psychological fields (Reker and Wong, 1985; Scheier *et al.*,1986; Van Treuren and Hull, 1986) and less interest was focussed on the

educational field. Thus, the present study aims to explore the relationships between the construct "optimism" and these other variables to discover if such a description of an optimist, as pictured in Carver and Scheier's theory, does in fact exist.

The last factor, considered important, concerns gender differences. Block (1984) suggested that three aspects of gender differences in personality development should be examined, namely, cognitive abilities, biological maturation and socialization. With regard to gender differences in cognitive abilities, particularly in science achievement, previous researches in Western countries showed that boys' achievement in science subjects is superior to that of girls (Comber and Keeves, 1973; Shaycroft *et al.* 1973; Vetter, 1976; Erickson and Erickson, 1984), and in contrast, Methen and Wilkinson (1988) found that, in a Middle-East country (Kuwait), girls attained significantly superior results to those of boys in all science subjects. In arts subjects including Literature and English language, Walker (1976) found that girls' achievement is, also, superior to that of boys. There are also numerous studies indicating that boys perform significantly better achievement and are more confident in learning mathematics than girls (Maccoby, 1966; Vetter, 1976 & 1980; Fox, 1980; Fennema, 1984).

Gender differences in biological maturation indicate that early developing girls may have more difficulty in adopting to puberty than early developing boys (Simmons and Blyth, 1987). Thus, psychological maturity which accompanies physiological maturity (Cohn, 1991), may lead girls to rely more than boys on "external" locus of control for poor achievement rather than attribute their failure to their own lack of ability and poor effort (Crandall *et al.*,1964; Crandall, 1969; Veroff, 1969; Nicholls, 1975).

In socialization experiences, studies of gender stereotypes by Lueptow (1984) and Ashmore *et al.* (1986) cited that girls are commonly portrayed as affectionate, sensitive, sympathetic, warm, gentle, cheerful, shy, and submissive. In contrast, they noted that boys are pictured as aggressive, competitive, ambitious, dominant, rational, unemotional, independent, and self-confident.

The present study aims to explore in a new and comprehensive way whether or not such findings noted by previous researchers, as revealed in this literature review, do actually exist in the Malaysian sample. The next chapter will describe the research methods and procedures (strategies) utilized to gather information pertinent to high-school students' achievement in Kuching City, Sarawak and its relationships to the selected predictor variables.

CHAPTER III

RESEARCH METHODOLOGY

3.0 Introduction

In the previous two chapters, the main aims of the research, the structure of the educational system in Malaysia and literature review were discussed. It is now necessary to translate the initial research problems into precise questions and testable hypotheses. So the next task is to select the most appropriate procedures or approaches of inquiry from different research methods, ranging from controlled laboratory experiments through participant observation to action research and from historical studies to logical analysis. This chapter discusses the type of research, identifies the sample to be used and the research procedures to be applied such as the techniques and measuring instruments to gather, analyses and interpret data. Later in this chapter, there will be discussions about the pilot studies involving the findings regarding the suitability and reliability of the selected instruments.

3.1 Research Design

This is a non-experimental *ex post facto*, survey-type research study. Kerlinger (1973) defines *ex post facto*

reseach as follows:

> *Ex post facto* research is systematic empirical inquiry in which the scientist does not have direct control of independent variables because their manifestations have already occurred or because they are inherently not manipulable. Inferences about relations among variables are made, without direct intervention, from concomitant variation of independent and dependent variables.
>
> (Kerlinger, 1973: 379).

Looking at Kerlinger's definition, *ex post facto* means "from what is done afterwards" and in social and educational research this phrase means 'after the fact' or 'retrospectively'. Kerlinger includes this type of research in an attempt to investigate possible cause-and-effect relationships by observing or assessing an existing situation and searching backwards in time for plausible casual factors.

The independent variables of an *ex post facto* study usually are identified or have already occurred before the data are collected. The researcher, thus, starts with the observation of a dependent variable. He then studies the independent variable or variables for their possible relations to, and the effects on, the dependent variable or variables (Kerlinger, 1973; Wiersma, 1986).

In this study, the precise dependent variable is student achievement or performance in the **Sijil Pelajaran**

Malaysia (SPM) external examination. It tries to invistigate what are the contributions to students' achievement in the SPM external examination of the independent variables such as dimensions of school motivation, approaches to learning, locus of control, optimism. A number of other independent variables will also be considered in this study, including the following:

- the gender of students
- student group : member of arts stream
  : member of science stream.
- geographical area : rural or urban area.
- residential status : boarder or day scholar.
- size of family.
- parents' education.

The basic design of this *ex post facto* research is corelational. Figure 3A below shows the casual model which attempts to identify the antecedents of the present condition.

FIGURE 3A

Correlational Model of *Ex Post Facto* Research

[O] *Dependent Variable*	[X] *Independent Variables*
1. *Students' Achievement (SPM Examination Results)*	1. *School Motivation* 2. *Learning Approaches* 3. *Learning Styles* 4. *Optimism-Pessimism* 5. *Locus of Control*

In this design, two sets of data are collected. One set of data is retrospective (the dependent variable, in this case the students' achievement) while the other (the independents variables) involves measuring existing outcomes such as dimensions of school motivation, approaches to learning, locus of control, and optimism-pessimism which were discussed earlier. The students' achievement or [O], that is their SPM 1989 examination results, is easily obtained from the records kept by the respective school office or by getting such information from the individual student in the study sample. Such student variables as approaches to learning, styles of learning, school motivation, locus of control and optimism are measured using suitable instruments. How these variables are measured will be discussed later in this chapter.

Looking at Figure 3A again, this design will provide the researcher with "leads" as to the possible causes of student achievement. Although a variable in this design cannot be confidently said to depend upon the other as would be in a truly experimental study, it is nevertheless usual to designate one of the variables as independent [X] and the other as dependent [O]. However, we must not overlook the possibility of reverse causality. The researcher starts with the observation of the independent variables, then studies the dependent variables in retrospect for their possible relationship to, and effect on, the independent variables.

The *ex post facto* study begins with groups that already differ in some respect and seeks out, in retrospect, factors which may have brought about this difference between the groups. Students in the present research already differ in their academic achievement (dependent variable) in such a way that there are those who achieved Grade One, Grade Two and Grade Three in their previous SPM external examination. These differences will be elaborated further, later in this chapter, when discussing the criterion of academic achievement used in Malaysia.

As the measurement of student achievement in the Malaysian School Certificate Examination (SPM) has already

occurred the *ex post facto* method is more appropriate and applicable than any other method. The *ex post facto* research, also, has some of the characteristics of descriptive, correlational, and experimental research (Lehmann and Mehrens, 1971). Lehmann and Mehrens further argue that it is descriptive because the researcher must describe his findings as he observed them. It is an extension of correlational research in that it attempts to ascribe casual relationships to the observed phenomena. Unlike correlation research, the *ex post facto* method attempts to deduce, or to discover "how" and "why" a particular phenomenon occurs. In this case, according to the authors, *ex post facto* method is akin to experimental research; however it does not "prove" cause-and-effect relationships.

However, the *ex post facto* method can and does provide educational research with valuable clues concerning the nature of phenomena: what goes with what and under what conditions. *Ex post facto* research is a valuable exploratory tool. This method can also give a sense of direction and provide a fruitful source of hypotheses that can be tested subsequently by more rigorous experimental methods. Another rationale for adopting and conducting this type of research design, and not experimental research, is that experimental research can be quite costly in time, effort, and money.

3.2 Criterion of academic achievement (Dependent Variable)

Schooling in Malaysia is highly competitive. Before 1973 students had to pass a secondary school entrance exam (the Common Entrance Examination) at the end of their sixth year in primary school, and only the top 30 percent (Seymour, 1977) could enter. Now the Common Entrance Examination is abolished and all students can enter a junior secondary school, but then they still have to face three more selective external examinations before entering university.

In Malaysia, both public and school institutions still rely on external examination results as criteria of achievement. Among school internal examinations are weekly, monthly, term or semester assessments; and the external examinations are the **Ujian Penilaian Darjah Lima** (Primary Five Assessment Test), **Sijil Rendah Pelajaran Malaysia** (Malaysian Lower Certificate of Education, Form III), **Sijil Pelajaran Malaysia** (Malaysian Certificate of Education, Form V), **Sijil Pelajaran Vokesynal Malaysia** (Malaysian Vocational Certificate of Education, for vocational students), and **Sijil Tinggi Persekolahan Malaysia** (Malaysian High School Certificate, Form VI). The reliability and validity of these examination results as criteria for 'failure-success', 'performing poorly-

performing well' or 'low achievers-high achievers' is a vexed question and beyond this study.

The **Lembaga Peperiksaan Negara, 1989** (National Examination Board) under the Ministry of Education Malaysia has outlined the scholastic grades of achievement in the **SPM** examination. The requirements needed for an award of each grade of the SPM certificate are as follows:

Grade I - must passed six subjects with at least five credits (range within 1-6 units) including **Bahasa Malaysia**. The overall aggregates must not exceed 23 units (ranging from 6 to 23 units).

Grade II - must passed six subjects with at least four credits including **Bahasa Malaysia**. The total aggregates must be within 24 to 33 units (must not exceed 33 units).

Grade III - must passed four subjects including **Bahasa Malaysia** with at least one credit or passed two subjects with two credits. Overall aggregates must not exceed 45 units.

* **Failing in Bahasa Malaysia** or obtaining aggregates exceeding 45 units means failing in the whole examination, but those who do not reach subject

grouping requirement will be awarded the Sijil Am Pelajaran (General Certificate of Education).

It is the number of aggregates, which is in the form of unit scores ranging from 1 to 9, in each subject that determines the success of students. Thus, the highest level of achievemment in each subject area is 1 (distinction) and the worst is a score of 9 (failed). The scoring system will be discussed in later paragraphs. Appendix 3C presents the subject-area groupings, whereby each candidate must select subject areas from Group I (Bahasa Malaysia) and four other groups. Each candidate may take as many subject areas as they wish, but the examination requirements are only based on the six best subject areas, including Bahasa Malaysia, which are selected from at least four subject-area groupings.

In any prediction study the most important measure is the criterion, and, furthermore, as mentioned earlier *ex post facto* begins with "groups that already differ in some aspects". In this case the criterion is not a matter of "failure" and "success". Generally all the sample is considered as a "success" group because they all have passed their previous external examination. The basic achievement groupings of the sample consist of Grade One, Grade Two and Grade Three.In this study, for easier discussion, it is suggested that the criterion to be

"low-achievers" and "high-achievers", in a sense almost similar to "failure" and "success". The "high-achievers" are those who achieve Grade One because they are the group, which is automatically offered and guaranteed places to further their studies within form six or pre-university classes. Those who achieved Grade Two and Grade Three are considered as "low-achievers" because only a very few from this group will continue to form six or further their studies in ordinary **sekolah menengah kerajaan** (government secondary schools) and **sekolah menengah bantuan kerajaan** (government-aided secondary schools) if there are places or vacancies available in a school. In 1983 the Ministry of Education, in its attempt to redress in a significant way the educational urban-rural imbalance, revised its selection criteria for intake into schools to cater for the needs of rural students. Thus, rural students who obtain only Grades Two and Three in the SPM examination still stand a good chance of being chosen to continue to Form Six, whereas the urban students have to obtain Grade One. At this stage, those who can further their studies as "success" students have a better chance of qualifying in the professions and in industry requiring "skilled-manpower". On the other hand, those who are unable to further their studies may be considered a "failure" because students within these groups find it difficult to procure good jobs. They are often no better than "dropouts" in the early secondary

stage or the failed candidates in the SRP and in the SPM examination itself. Indeed they were among the 50 percent or the half of 448,600 who were jobless or unemployed in 1985 (Government of Malaysia, 1986).

Entwistle and Wilson (1977) have discussed Stott's analysis of the meaning of 'success' in the work situation particularly that of the student. According to the authors, Stott suggested that there are five factors in success, namely, progress, competence, satisfaction, fitness and adjustment. For the individual to be described as 'successful' all of these factors must be related harmoniously. He must be 'progressing' satisfactorily, whether up the career ladder (or in this case further study) or towards graduation; he must be 'competent', satisfactorily performing his duties in a qualitative as well as quantitative sense (attaining a high standard as well as sufficient output); and he must experience an adequate level of 'satisfaction' or sense of well-being in the work or study in which he is involved.

According to Entwistle and Wilson (1977), a student's success as judged by examination achievement, includes only the first two elements in Stott's definition; not taking into account the student's feelings. An examination is the only means of assessment as a relatively objective 'magic measuring stick' of achievement in

Malaysia. The Lembaga Peperiksaan Negara (National Examination Board) has a direct control over all external examinations to ensure that all examinations are valid and marked reliably. The examination marks are counter-checked by various examiners at the national level. The Lembaga Peperiksaan Negara are aware and do take very serious precautions to safe-guard marking standards. All subjects are accordingly marked at the same standard and the marks range from a distinction grade (unit scores 1 and 2) through to unit scores of 3, 4, 5 and 6 which are regarded as a credit pass; while unit scores of 7 and 8 are considered as an ordinary pass. A unit score of 9 is counted as a fail (Lembaga Peperiksaan Negara, 1989).

This study utilizes both primary and secondary data. Primary data are drawn mainly from the student sample by using various instruments or test materials which will be discussed in the next section. Also, first-hand data were collected from personal interviews with students, teachers, principals of schools, some officers in the Statistics Department, and staff in the Mayor's Office of Kuching City North. The secondary data were drawn particularly from the eight schools in my study area, the Kementerian Pendidikan Malaysia (Malaysia Ministry of Education) in Kuala Lumpur, the Jabatan Pendidikan Sarawak (Sarawak Education Department) in Kuching and various

government institutions in Sarawak and the Brynmor Jones Library at the University of Hull.

3.3 Predictive Measures (Independent Variables)

In the previous section we have discussed how the dependent variable, namely, student achievement is measured and the next step is to discuss the selection and measurement of predictive variables. From a review of the literature it is seen that some of the most important variables affecting achievement are school motivation, approaches to learning, styles of learning, locus of control and optimism. Thus, it was decided to explore the contribution of these independent variables to predicting student achievement. So suitable measuring instruments were selected to measure these variables but these instruments had to be modified to make them more appropriate for use in Malaysia.

In this study, three inventories, namely, (1) School and School Work, (2) Internal-External Locus of Control, and (3) Life Orientation Test, were thereby adopted and modified to measure these predicted variables. Other independent variables consisted of self-selected demographic data.

The first inventory, the *'School and School Work'* was a combination of items already available from the 'School Motivation Inventory' and the 'Lancaster Approaches to Studying Inventory' developed by Kozeki in Hungary and Entwistle in England, respectively (Entwistle and Kozeki, 1985 and 1988). According to the authors, this inventory was subsequently developed further for use with students and extended to cover both motivation and study methods. This inventory is designed to measure aspects of school motivation and students' approaches to learning and styles of learning using an originally 120-items Likert-type form. As discussed earlier, the Kozeki's nine motivational categories (see Table 2.1) consist of warmth, identification, sociability, independence, competence, trust and self-esteem, interest, compliance and responsibility. Also included are Entwistle's motivational categories (see Figure 2B) such as intrinsic motivation, fear of failure, instrumental motivation, hope for success and conscientiousness together with his learning approaches and styles such as deep approach, surface approach, strategic approach, holist style and serialist style (see Table 2.3).

Malaysia is pursuing a policy of the developing the school into a community institution, involving the whole community at large which includes parents, teachers and pupils, who are expected to co-operate and to be concerned

for the success of the school and the discipline of pupils. The concept of a community-based school is encouraged through the activities of **Persatuan Ibu-bapa dan Guru - PIBG** (Parents-Teachers Association) in Malaysia. This organisation, also, benefits the school through financial contributions (charities) and direct involvement of the community in upgrading school facilities, assistance in the provision of teaching and learning materials, and participating in various school activities. The community, also, benefits from the use of school facilities and the involvement of teachers and pupils in community activities. Such co-operation and the good relationships between parents, teachers and students acting together should give essential positive motivation to students' learning (Kozeki, 1985). This should have implications towards better student achievement.

The second inventory chosen was Rotter's '*Internal-External Locus of Control*' which tries "to find out the way in which certain important events in our society affect different people" (Lefcourt, 1982: 209). According to Rotter (1966), persons differ in their response to the effects of reward or reinforcement on preceding behaviour. These differences depend in part on whether the person perceives the reward as contingent on his own behaviour or independent of it; whether acquisition and performance are determined by skill or chance; and

whether their generalized expectancies are determined by "internal" or "external" control of reinforcement. In other words, locus-of-control measures in this study try to identify whether individuals see their high-achievement or low-achievement in the SPM examination as caused by their own ability and effort (internal locus of control). On the contrary, they may see their 'success' or 'failure' to achieve better grades as simply the result of luck or environmental conditions (not enough facilities, involved too much in games and school activities, lack of time for revision or lack of teachers) over which they have no control (external locus of control).

The third inventory selected for the study was the '*Life Orientation Test*', developed by Carver and Scheier (1985) for measurement of "optimism". Carver and Scheier (1985, 1987) and Carver and Gaines (1987) stated that most of the past studies on optimism were in medical or health research and that almost no empirical data, using their scales, were available within the educational field. Carver and Scheier (1988) have suggested that the optimism-pessimism scales could, also, be of considerable use in educational research. The inventory in this present study is used to explore relationships between "optimism" and both the dependent and other independent variables.

To have a better understanding of the findings of the research involving the predicted variables, it is useful to know something of the ways in which the instruments have been constructed. Among the most popular methods of construction are the Thurstone technique and the Likert technique (Oppenheim, 1966). The Thurstone technique involves the inclusion of a number of statements reflecting various positions on an attitude continuum viz. neutral, positive and negative. Respondents are asked to select those statements which most closely resemble their own beliefs. Each statement is given a value which is unknown to the respondent. In the Thurstone technique, a respondent's score is the mean or median of these selected statements.

The three selected inventories used in this study adopted the Likert technique. A Likert scale consists of a number of opinion statements each reflecting either a favourable or an unfavourable reaction to the attitude object in question (Oppenheim, 1966; Ato, 1981). Neutral items permitted in Thurstone scales are of no value in Likert ones. Thus, the instruction in this study requested the respondents to try to avoid the 'C' answer -"not sure or not understood" (in School and School Work) and "I neither agree nor disagree" (in Life Orientation Test), if they possibly could.

The constructor of the scale has to make a tentative judgement as to whether an item is 'pro' or 'anti' with respect to the attitudinal 'object' measured by the instrument. Each statement is followed by a set of between two and seven responses. In the case of the School and School Work Inventory, instructions adopted were exactly as those used by the authors. Items in this inventory contained comments made by students about their school and school work. Students are asked:

"To what extend do <u>you</u> agree or disagree with comments?"

The five choice response pattern range from - "Close to my own feeling or experience" to "I feel rather the opposite of this" on an 'A', 'B', 'C', 'D', and 'E' (5-point) scale. The responses are then scored 5, 4, 3, 2, and 1 (or 1, 2, 3, 4, an 5) according to whether the item is a positive or negative statement. In this way higher scores will always accrue to those expressing responses more favourable to the subject of the scale, thus giving a maximum of 30 for sub-scales (Entwistle and Kozeki, 1984 and 1985).

The Life Orientation Test (LOT) inventory (optimism-pessimism test) also uses a Likert five-choice response pattern. Pupils are again requested to give their own opinions regarding the general comments specified. Responses on scale: 'A'- I agree a lot, 'B' - I agree a

little, 'C' - I neither agree nor disagree, 'D'- I disagree a little, and 'E'- I disagree a lot, are respectively coded 5, 4, 3, 2 and 1, if the statement is positive. It is scored in the "optimistic" direction, thus, students with higher scores are regarded as the more optimistic ones.

The Rotter's Internal-External Locus of Control scale is a 23-item force-choice questionnaire in which each statement or item is followed by a set of two responses or a pair of alternatives lettered A or B. Pupils are requested to select only one statement of each pair which "you more strongly believe to be the case". It is scored in the "external" direction, that is, one point is given for each "external" statement selected; the higher the score the more external the individual will be regarded (see Lefcourt, 1982). In this study, the researcher coded each item as '0' for internal and '1' for external. Thus, the possible range of scores is from 0 to 23.

3.4 Administration of Instruments

Once instruments have been selected to measure the independent variables, the researcher faces the problem of translating them. All these selected pencil-and-paper tests, which were originally in the English language, were translated to Bahasa Malaysia (Malay language) to suit the

Malaysian subjects. The translations of each item of the inventories to **Bahasa Malaysia** was carefully discussed and checked with some senior officers in the **Jabatan Pendidikan Sarawak** (Sarawak Education Department) and with university colleagues who were competent in both languages. The translations were finally examined by a professor at the Faculty of Education, University of Agriculture, Malaysia **(Universiti Pertanian Malaysia)**, to ensure that they were sufficiently colloquial and that the meanings were equivalent in the two versions. To avoid any ambiguity in wording and to ensure that the instruments were fully intelligible to the samples involved, the researcher again had discussions with students and their form-teachers in a two-day pilot study before carrying out the main study.

The researcher assumed that all the subjects were competent in **Bahasa Malaysia**. Although they were from different ethnic groups, they have been using the **Bahasa Malaysia** since the beginning of their schools' life (see Appendixes 1D and 1E). At the stage of Form Sixth Lower, they must have scored at a credit pass, if not distinction, in the previous two external examinations - **Sijil Rendah Pelajaran Malaysia** (Malaysia Lower Certificate of Education) and **Sijil Pelajaran Malaysia** (Malaysia Certificate of Education) to qualify them to enter the Form Four and Form Six, respectively.

Furthermore, **Bahasa Malaysia** is the national language and the official language widely spoken by people on the street. In case there might be subjects, particularly new foreign students in the schools who were inefficient in **Bahasa Malaysia**, English language versions of the tests were prepared to which these students could refer on request.

Before conducting any research, it is important to contact the authority concerned and seek their permission. The pilot and the main studies were conducted only after the **Kementerian Pendidikan Malaysia** (Malaysia Ministry of Education) and the **Jabatan Pendidikan Sarawak** (Sarawak Education Department) accepted an application for permission to conduct research in schools in the Kuching City and had issued a research permit (see Appendixes 3A and 3B), allowing the researcher to collect primary data from the selected schools. Without such an official permit, the **Pengetua** would not have allowed any researcher to conduct his study, and it is likely that staff and students would have been reluctant to co-operate in the project or to provide details of academic performance to outsiders.

This was in line with the suggestion given by Evans (1978) that permission to carry out research must always be obtained in advance of starting it and nothing should

ever be done without the knowledge and consent of the head and any other members of staff who might be affected; also it is necessary to get the permission of the Chief Education Officer of the area.

Where data take the form of questionnaires or tests given to groups of students as in this study, it is difficult to ensure that suitable conditions are available. Thus, one or two days before the pilot and the main studies, an appointment to approach the **Pengetua** (Principal) of each respective schools was made by the researcher to discuss if he could provide suitable rooms - ideally under examination conditions using well-spaced tables; and to allocate the duration time to be taken, from the official school time-table, to carry out the study. Also, the possibility of getting assistance from the **Guru Tingkatan** (Form Teacher) was requested. As mentioned earlier, with the research permit in hand, the research project was made very official and every one gave full co-operation. The researcher got satisfactory 'examination conditions' in class-rooms except in two schools where use had to be made of well-spaced seats in lecture halls. The administration of the instruments, adopted in each school was as uniform as possible. All the instruments were self-administered by the researcher.

Wilkinson (1975), also, specified that it was important to maintain and ensure similar procedures and conditions under which the students worked during the administration period in each school especially through the standardization of instructions. Apart from that, to minimize external influences and hence, to elicit honest opinions, the students were told that the data from the measuring instruments would be treated with the strictest confidentiality. They were not requested to write their names on the measuring instruments. The students, therefore, were aware that their responses to items in the instruments would not be seen and known by their teachers, or other influential adults.

In my pilot and main studies, the Guru Tingkatan were not only helped to distribute the questionnaires but, also, gave co-operation in administrating the tests to his students in up to six separate class-rooms.

In administrating a research project, the researcher must not expect the students to be eager volunteers. They must first be persuaded to co-operate in the project by informing them as it was worthwhile and that it might be of value to future generations of students, if not to themselves. They have to be convinced that all the information would be treated confidentially. These points

were stressed orally as well as written in the instructions of the questionnaires.

The primary data which were collected, have to be marked and coded consistently and highly accurately, being checked and double-checked at every stage. The analysis of the data generally involved the use of the computer - the SPSS^{X} programme (Nie et al. 1975). Details of the methods of analyses to be used for each research question or hypothesis will be discussed in Chapter IV on Data Analysis and Findings.

3.5 The Sample

Entwistle and Nisbet (1972) were of the view that there was no single correct procedure for sampling. They suggested that the method chosen depended on the purpose of the inquiry, on the types of analyses to be made and on certain restrictions - time, staff, facilities- which have to be accepted as external constraints. Evans (1978), also, argued that it was neither sane nor honest to embark on research which might use the time, effort and money of many other people besides the researcher.

With this in mind, the researcher used a non-random sample because his purpose of inquiry involved all the

Lower Sixth students of the eight high schools found in Kuching City in 1990. The sample consisted of students of average age of seventeen years. On one hand, this restrictive sample limits the outcomes of the research to be applied only to Lower-Sixth students in Kuching City. But on the other hand, in terms of composition of ethnic groups, gender and academic streams, the sample really could reflect the entire student population of Sarawak. The main study was conducted in all eight high schools (post-secondary schools) in Kuching City in July 1990. Altogether 925 students of the Lower Sixth Form from eight high schools in Kuching in 1990 participated in the main study. This sample can be broken down as shown in Figures 3B, 3C, 3D, 3E and 3F. In studies of this kind, it is possible to ensure that the data supplied are complete. To ensure that all students, present on that day, had completed and returned the tests (questionnaires), the researcher re-checked and re-counted their answer sheets and tallied them with the number of students present.

Figure 3B presents the breakdown numbers of the sample by schools. All eight high schools in Kuching City participated in this study, namely, [1] Kolej Datuk Patinggi Abang Haji Abdillah (Datuk Abdillah College); [2] S.M.K. Tun Abang Haji Openg (Tun Openg Secondary School); [3] S.M.K. Green Road (Green Road Secondary School); [4] S.M.K. Sheikh Othman Haji Abdul Wahab, Matang (Matang

FIGURE 3B - The Breakdown Numbers of Sample By Schools.

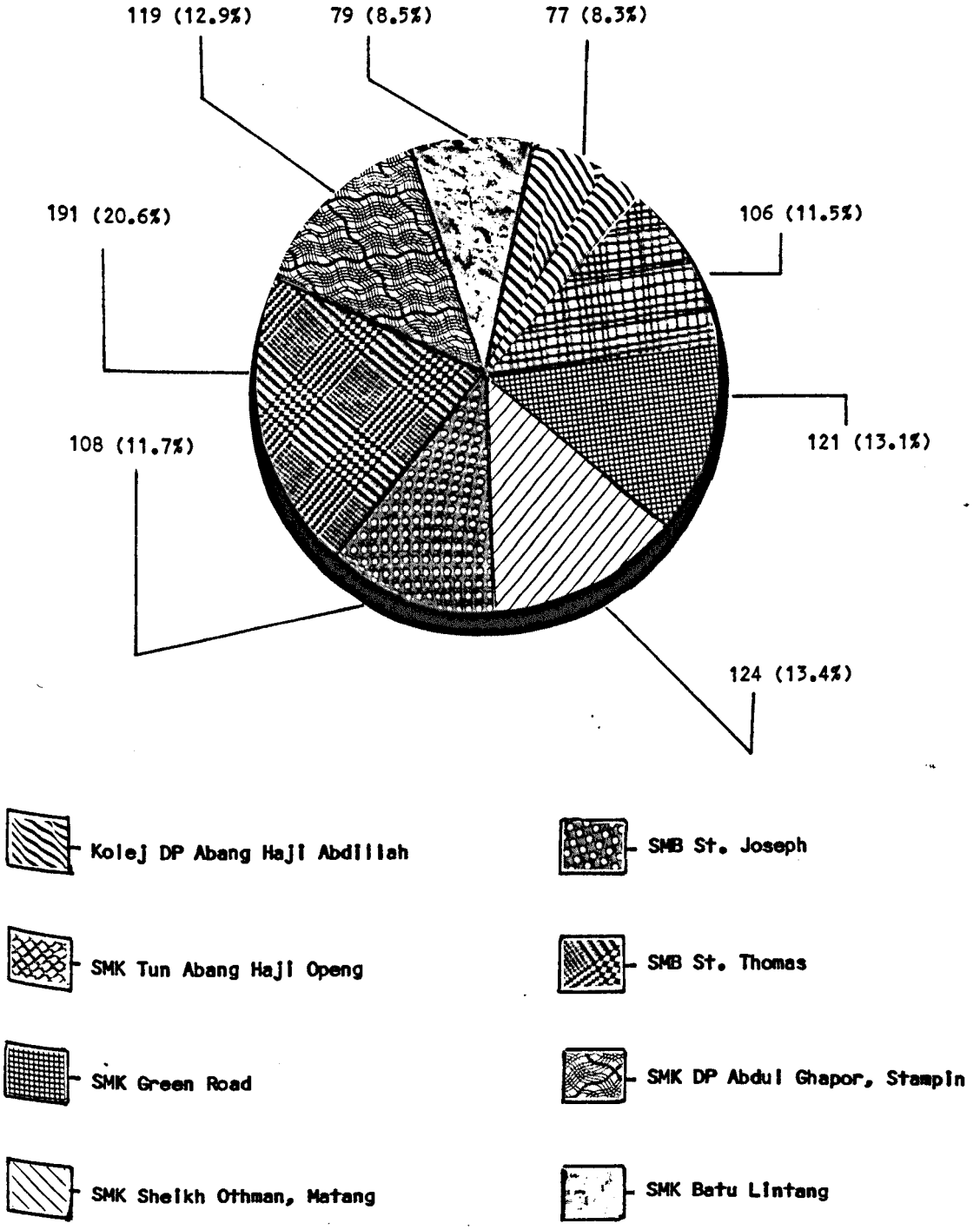
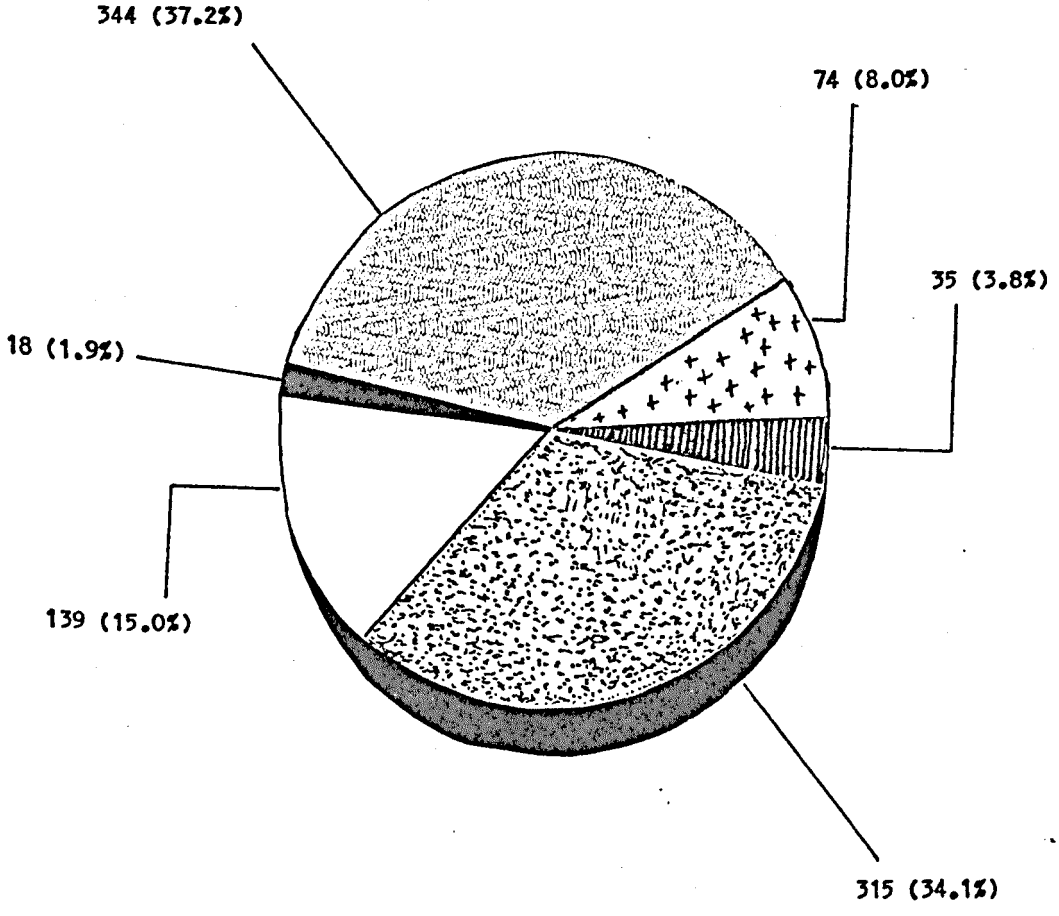


FIGURE 3C - The Breakdown Numbers of Sample By Ethnicity



Secondary School); [5] S.M.B.K. St. Joseph (St. Joseph Secondary School); [6] S.M.B.K. St. Thomas (St. Thomas Secondary School); [7] S.M.K. Datuk Patinggi Haji Abdul Ghapor, Stampin (Stampin Secondary School); and [8] S.M.K. Batu Lintang (Batu Lintang Secondary School). The pie chart shows that out of 925 students, 77 (8.3%) were from '[1]'; 106 (11.5%) were from '[2]'; 121 (13.1%) were from '[3]'; 124 (13.4%) were from '[4]'; 108 (11.7%) were from '[5]'; 191 (20.6%) were from '[6]'; 119 (12.9%) were from '[7]' and 79 (8.5%) were from '[8]'.

The pie chart in Figure 3C shows the breakdown numbers of the sample by ethnicity, namely, (1) Malays- 344 (37.2%); (2) Ibans - 74 (8.0%); (3) Melanau- 35 (3.8%); (4) Chinese- 315 (34.1%); (5) Bidayuh- 139 (15.0%); and (6) Others (other minority indigenous ethnic groups)- 18 (1.9%). Figure 3D presents the breakdown numbers and percentages of sample by academic stream (arts or science), gender, residency (urban or rural) and residential status (boarder or day scholar). Out of 925 students: 594 (64.2%) are arts-stream students, 331 (35.8%) are science-stream students; 361 (39.0%) are boys, 564 (61.0%) are girls; 549 (59.4%) are from urban areas, 376 (40.6%) are from rural areas; and 614 (66.4%) are day scholars, while 311 (33.6%) are boarders.

FIGURE 3D - The Breakdown Numbers and Percentages of Sample By Academic Streams (Arts/Science), Gender, Residency (Urban/Rural) and Residential Status (Boarder/Day Scholar).

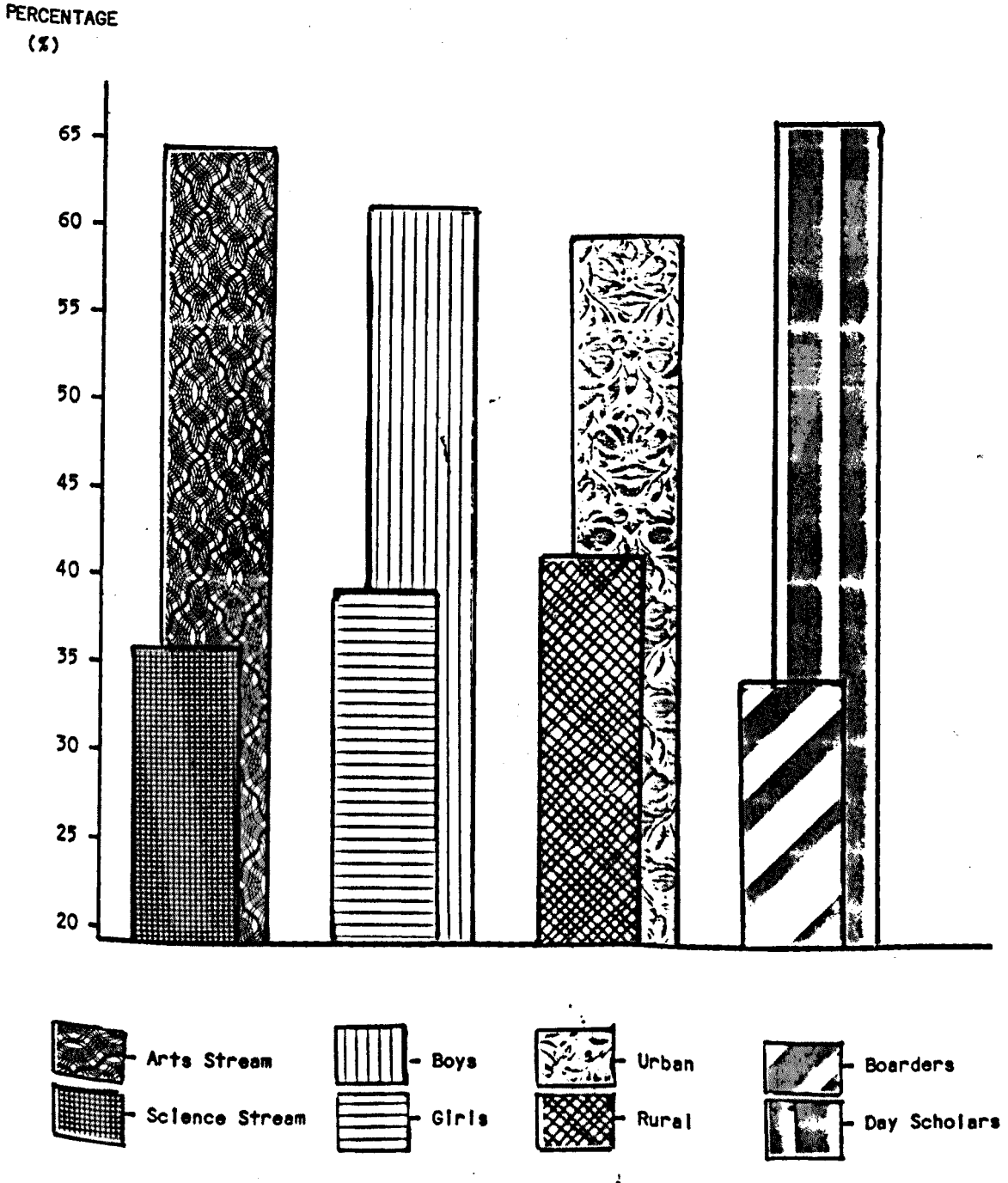


FIGURE 3E - The Breakdown of Numbers and Percentages of Sample By Their Family Size.

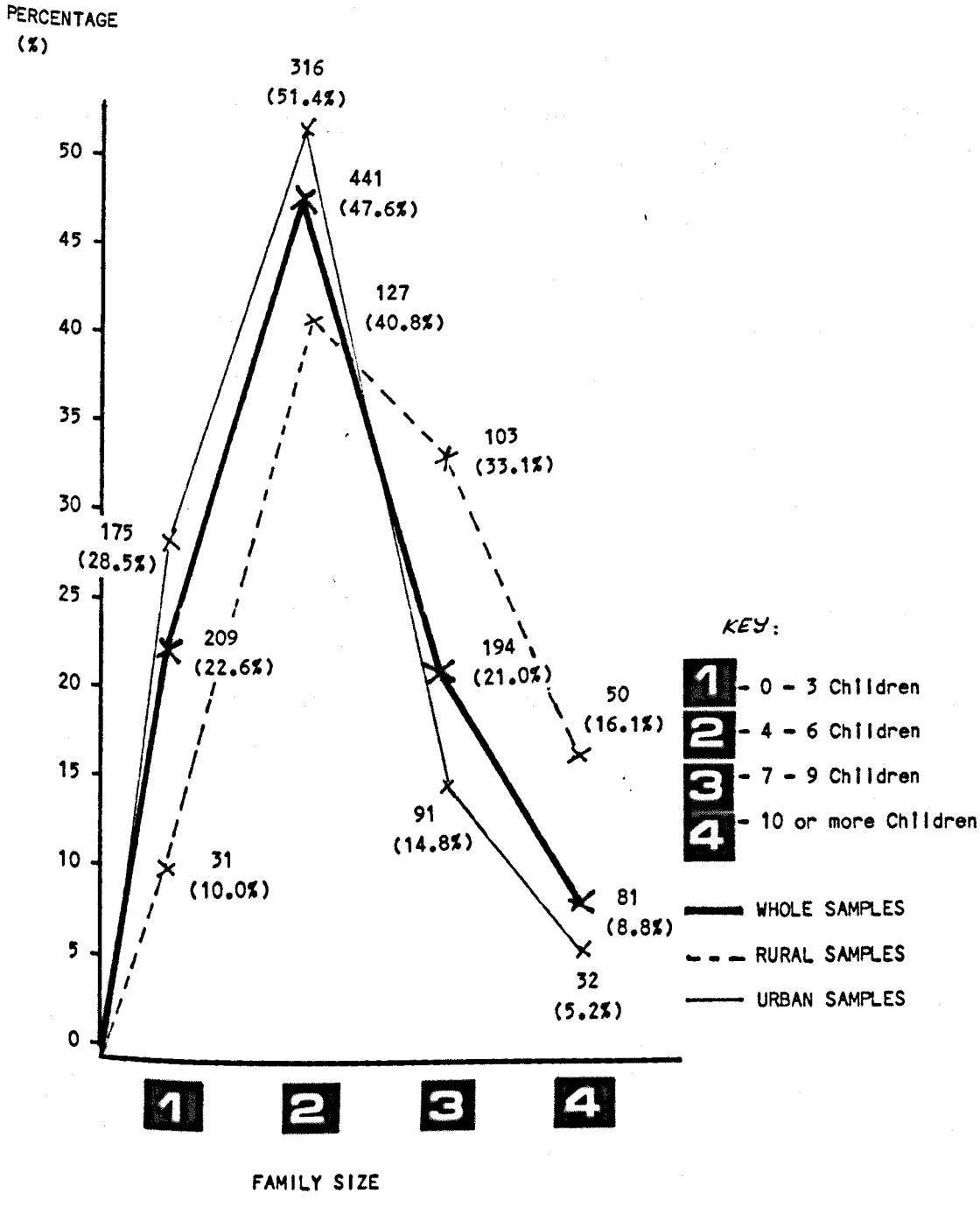


Figure 3E reveals the breakdown of numbers and percentages of sample by their family size. Some features of Figure 3E merit comment. Out of the whole sample of 925, 209 or 22.6% have brothers and/or sisters between 0 to 3; 441 or 47.6% have 4 to 6 brothers and/or sisters; 194 or 21.0% have 7 to 9 brothers and/or sisters; and 81 or 8.8% have 10 or more brothers and/or sisters. Among the rural sample, only 31 or 10.0% have 3 or less brothers and/or sisters whereas 50 or 16.1% have 10 or more. In contrast, the urban sample has more smaller families with 175 (28.5%) having the least children, while only 32 (5.2%) urban families have the most children.

The breakdown numbers and percentages of the sample by their parents' academic qualifications are revealed in Figure 3F. More mothers than fathers have no formal education, 348 (37.6%) as opposed to 169 (18.3%); 346 (37.4%) fathers have primary 1-6 education, almost the same number as mothers; 171 (18.5%) fathers have form 1-3 education in contrast to 131 (14.2%) mothers; 138 (14.2) fathers reach form 4-5 education compared to 74 (8.0%) mothers; 39 (4.2%) fathers as opposed 10 (1.1%) mothers have form 6 (lower and upper sixth); 30 (3.2%) fathers have a certificate or diploma, and 32.6% (3.6%) possess a degree qualification, whereas among mothers only 7 (0.8) have a degree qualification.

FIGURE 3F - The Breakdown Numbers and Percentages of Sample By Their Parents' Academic Qualifications.

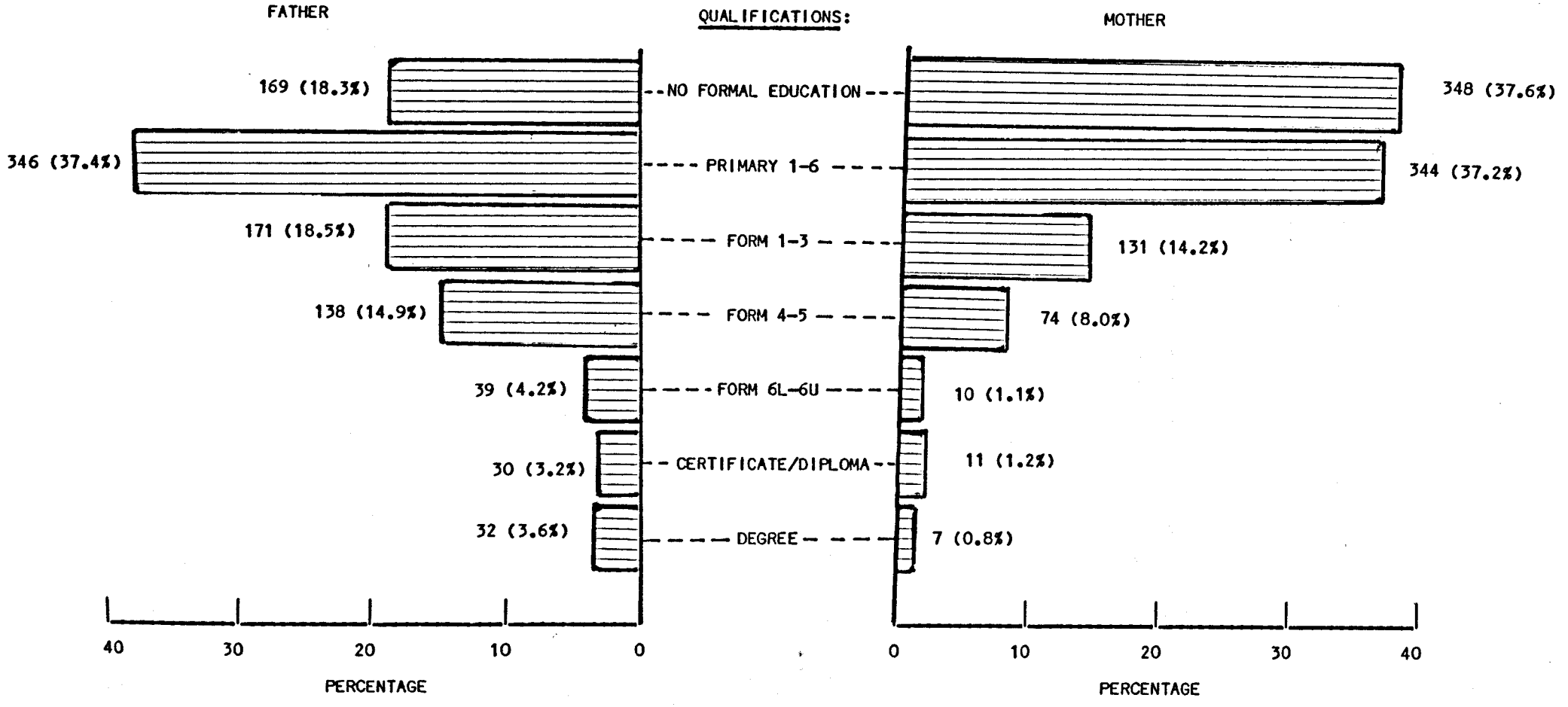


Figure 3D shows that 376 out of 925 or 40.6 percent of the sample were from rural areas; and 311 (33.6 percent) were boarders or in residential schools. This shows that these students came from rural areas outside the Kuching City. A demographic question in my questionnaire asked:

> *"If you are not from Kuching City, please state your home address:* _____

The respondents gave their home addresses from within various divisions and districts throughout Sarawak.

Kuching city, being a cosmopolitan capital city, which provides more high schools and learning institutions with better facilities than any other part of Sarawak, attracts many urban-migrants as discussed earlier in Chapter I. The statements cited below further supports the status and the cosmopolitan nature of the City. These characteristics are reflected in the chosen sample.

> Kuching is officially inaugurated as a city after having met certain procedures and prerequisites.. One of the prerequisites met was having higher institutions of higher learning, of international standard.

> Many have migrated from various parts of the state to the capital city in search of better prospects. The result is a colourful congregation of people - Malay, Melanau, Iban, Bidayuh, Orang Ulu, Chinese, Indian and others - who brought with them their unique lifestyles and cultures.
>
> (Sarawak Tourist Association, 1988 :35)

3.6 Pilot Study

This section has three distinct objectives. Its main objective is to check the suitability of the items in each scale contained in the instruments and then to check the reliability and validity of each instrument to be used in the main study. The main concern here was to ensure that the items themselves were appropriate to Malaysian culture and that the scales were valid and reliable.

The next section examines the second objective, being a comparative study of relationships between learning approaches and motivation among the British, Hungarian and Malaysian adolescents. All the selected pencil-and-paper test materials used in the present study, namely: (1) School and School Work; (2) Rotter's Internal-External Locus; and (3) Life Orientation Test (LOT), which were originally used in the English language, were translated into **Bahasa Malaysia** (Malay language). Apart from getting more familiar with the statistical package, the comparative study in the pilot study was conducted on the assumption that if there were similarities between previous and present findings, the instruments in the Malay versions are likely to be equally reliable.

The pilot study was conducted in two stages, one in mid August and the other in late September 1989, after

permission for the research to be carried out in the selected schools was obtained from the **Kementerian Pendidikan Malaysia** (Malaysia Ministry of Education) and the **Jabatan Pendidikan Sarawak** (Sarawak Education Department). As discussed earlier, it was very important to obtain permission from the authorities concerned because without it, the **Pengetua** (Principal) would not allow any researcher to conduct his research and his staff and students would be reluctant to give co-operation or to provide details of academic performance to outsiders.

It took four successive days to carry out the first study. One or two days before the first pilot study took place (as well as the second pilot study), an appointment to approach the **Pengetua** of each respective school was made by the researcher to discuss the time to be taken from the official school time- table to carry out the study. Also, the possibility of getting assistance from the **Guru Tingkatan** (Form Teacher) was requested. On the actual day, a voluntary education officer and the **Guru Tingkatan** helped the researcher to distribute the questionnaires and co-operated in administrating the tests to the students. The tests took about 35 to 45 minutes for students to complete. After administrating the tests, the following procedures were followed:

(a) In the first stage of the pilot study, the researcher requested six volunteers, who were competent in

both English language and **Bahasa Malaysia**, to translate the questionnaire from **Bahasa Malaysia** to English language. The rationale for doing this will be discussed later in this chapter under the section of reliability and validity.

(b) In the second stage of the pilot study, the researcher spent some time in the classroom discussing openly with the students (respondents) and, later with their teachers, the items contained in the instruments. This was to check the accuracy of the translation of the items and whether or not they agreed with its translations undertaken in the first stage. These informal discussions were conducted to avoid any ambiguities in the wordings and to ensure that the instruments were fully intelligible to the students.

It was not quite necessary to involve the **Guru Tingkatan** because they were not the respondents. Since the items measure teacher's motivation and influence towards student's success or achievement, the researcher decided to asked their opinions, as well, about the items and the translations done by their students. The **Guru Tingkatan** were very responsive. The discussions went beyond topics which were being measured in the instruments such as juvenile delinquency, early school withdrawal and retention. Wilkinson *et al.* (1988 :32) suggested that it was wise to discuss with their teachers regarding the

students because "....the classroom teacher was the one who knew better than anyone else the reasons behind certain behaviours, procedures and decisions of students."

Samples of the Pilot Study

First Stage

It took four successive days to carry out the first study. Two days were spent on appointments with the Pengetua to arrange a research schedule, to select the number of respondents and to look at data on students' achievement kept in the school's record office.The extra two days were used to administer and conduct the study to the selected samples in their respective schools.

The first study was conducted in two high schools in Kuching City : Sekolah Menengah Bantuan Kerajaan St.Thomas (St. Thomas' Aided Secondary School) and Kolej Datuk Patinggi Abang Haji Abdillah (Datuk Patinggi Abang Haji Abdillah College). These two high schools were selected for various reasons. The most outstanding reason was the dissimilarities between these two schools in some aspects as follows:

a) St.Thomas' School, built almost one and a half century ago, is one of the oldest schools in Sarawak state whilst Abdillah College only started in 1978;

b) St.Thomas' School is a mission school aided by the government while Abdillah College is a government school receiving full financial and administrative support from the government;

c) Unlike St.Thomas' School which is a day-school, Abdillah College is a boarding or residential school. It is categorized by the **Jabatan Pendidikan Sarawak** (Sarawak Education Department) as a 'special' school and upgraded to 'college' status (more budget allocation and, thus has more and better facilities than the ordinary school) because its intake of students is from various parts of Sarawak with different ethnic backgrounds. It is government policy to 'urbanize' potential rural students by giving them better accommodation and educational facilities in the capital city, which they lack in the less-developed rural schools.

In this first study, 60 lower-sixth formers of average age of seventeen years were selected from one science stream class (N=25) of St.Thomas' School and one arts stream class (N=35) of Abdillah College present on a particular day for the pilot study. Thus, all students from each class participated. It was possible to ensure that all students present in the respective classes on that day had completed the tests or questionnaires by rechecking and recounting their returned answer sheets.

Second Stage

It was presumed that the previous sample was possibly too small to make a good comparative study with previous researches, so a second study was undertaken to include more schools and students. The second study was conducted in late September 1989 and covered three other schools namely **Sekolah Menengah Kerajaan Datuk Patinggi Haji Abdul Ghapor, Stampin** (Datuk Patinggi Haji Abdul Ghapor Government Secondary School, Stampin), **Sekolah Menengah Kerajaan Batu Lintang** (Batu Lintang Government Secondary School) and **Sekolah Menengah Bantuan St. Joseph** (St.Joseph's Aided Secondary School). This second study selected 256 students and was conducted in five successive days. All the previous precedures of administrating the tests, as followed in the in my previous study, were followed except they were no longer aimed to check the tests' reliabilities. The 256 students of the second pilot study were also lower-sixth formers and this sample could be broken down as follows:

a) Academic Stream:	Arts	- 195
	Science	- 61
b) Gender:	Boys	- 99
	Girls	- 157

c) Ethnicity:

Malay	-	86
Chinese	-	83
Bidayuh	-	63
Iban	-	24

A discussion of these ethnic groups and where they originated in Sarawak has already taken place in Chapter I under the section dealing with Sarawak population.

3.7 Reliability and Validity

In an empirical study, one will encounter such terms as 'reliability of research' and 'reliability of measurement'. Reliability of research "concerns the replicability and consistency of the methods, conditions, and results." (Wiersma, 1986 :7). In the reliability of research, we distinguish between internal and external reliabilities. Internal reliability refers to the extend that data collection, analysis, and interpretation are consistent given the same conditions. External reliability deals with the issue of whether or not independent researchers can replicate studies in the same or similar settings. It was regarded as unnecessary to check the 'reliability of research' as the means of collecting data were by questionnaires in which the instructions, methods and conditions were consistent. There was, also, no problem of 'replicating studies' from one school to another because the tests in the form of questionnaires could easily be

given under examination conditions. These 'similar settings' could easily be achieved in all schools through prior arrangements with the Pengetua (Principal) of the respective schools.

According to Wiersma (1986 :288), " the term reliability of measurement refers to 'the consistency of the instrument in measuring whatever it measures". This type of 'reliability' refers to the consistency of scores obtained by the same person when retested with the same test on different occasions or with different sets of equivalent items. In other words, reliability underlies the computation of the error of measurement of a single score, whereby we can predict the range of fluctuation likely to occur in a single individual's score as a result of irrelevant chance factors.

The concept of 'test reliability' or 'reliability coefficient' has been used to cover several aspects of score consistency. It indicates the extent to which individual differences in test scores are attributed to 'true' differences in the characteristic under consideration and the extent to which they are attributed to chance errors. Reliability coefficients can take on values of 0 to 1.0, inclusive.

Reliability analyses are necessary as there was no previous information available on the reliabilities of the selected instruments in Malaysia, a developing third world country. The first pilot study also tried to find out whether or not the items were personally relevant to students and designed to be colloquial and familiar to Malaysian's culture and students' life background.

Several procedures can be used to estimate reliability. All of them have computational formulae that produce reliability coefficients. Among the commonly used procedures are: (a) parallel forms or alternate forms of the same test to give two presumably equivalent forms and, then, to study the correlation between the resulting two sets of scores, (b) test-retest so as to give the same test form on two separate occasions and, then, to study the correlation between the results from the two testings, and (c) internal consistency in which a single form is given consisting of several sections or a number of items and, then, to study the consistency of performance over the sections or items.

In this study, the data-collecting strategy relies on the internal analysis of data obtained from a single test administration. The main reason of using the internal-consistency testing procedure was its practical advantages as follows:

(a) the researcher couldn't afford to administer the test on two or more occasions, as with the test-retest procedure, as it involved more expenditure, time and energy;

(b) the procedure requires only the development of a single form of the test (questionnaires) that could be used throughout the study; and

(c) the co-operation of the sample is required for only a single period of testing. Thus, it has least interruptions on school time-tables and students' normal lessons.

To generate such coefficients of internal consistency from a single administration of the test, the researcher carried out the procedures known as the Cronbach alpha, Kuder-Richardson Formula 20 (KR-20) and split-half.

According to Thorndike (1988) the Cronbach alpha coefficient, like Kuder-Richardson Formula 20, as its special case, is a single-facet approach in which the analysis is carried out at the item level. If the data are in dichotomous form, Cronbach alpha is equivalent to a KR-20 reliability coefficient. Thus, in the case under consideration there is: (a) a between-persons variance component, (b) a between-items component, and (c) an

interaction-of-persons-with-items. The Cronbach alpha coefficient can be algebraically computed by the equation (Thorndike, 1988: 340):

$$\alpha = \frac{n}{n-1}\left(1 - \frac{\sum s_i^2}{s_t^2}\right)$$

where n is the number of items in the test, s_i^2 is the variance of item i, and s_t^2 is the variance of the total test.

When all the items are scored either '0' or '1' , as in the Rotter's Internal-External Locus of Control Inventory, coefficient alpha reduces to Kuder-Richardson Formula 20 (KD-20)(Thorndike, 1988). It is suggested here that the KD-20 is more appropriate for this type of test. The Kuder-Richardson Formula 20 (Turney and Robb, 1971:157) is:

$$KR_{20} = \frac{N}{N-1}\left(\frac{S^2 - \Sigma pq}{S^2}\right),$$

where

S^2 = the variance of the total test scores,
p = the proportion of people getting each item correct,
q = the proportion of people getting each item incorrect,
N = the number of items on the test, and
Σpq = the sum of the product of p and q for each item on the test.

In computing a split-half reliability, the test items are divided into two equivalent halves, so as to obtain two separate scores - one for each half. If the test is reliable or consistent, the scores on the two halves will have a high positive association. In other words, an individual scoring high on one half would tend to score high on the other half, and vice versa. The correlation between the two sets of scores is then corrected by the Spearman-Brown Prophecy Formula to give an estimate of the reliability coefficient for the full-length test. The split-half reliability formula is:

$$r_{tt} = \frac{kr_{tt}'}{1 + (k - 1)r_{tt}'}$$

where

r_{tt} = the corrected coefficient of correlation

r_{tt}' = the obtained coefficient (between the halves)

k = the number of times the test was shortened or lengthened ($k = 2$ if a split-half correction is needed)

The checking of reliabilities was also done by using the Cronbach alpha coefficient as used by Kozeki and Entwistle (1984) when testing reliability of the same instrument - the 'School and School Work'. The Cronbach's coefficient alpha formula handles test exercises in which scores can take a range of values, as in the 'School and School Work' and 'Life Orientation Test (LOT)' inventories that provide multiple levels of response, say, a rating from 1 to 4. According to Thorndike (1988: 342), "the Cronbach alpha formula can be applied when the '*items*' are themselves groups of test exercises". Thus, the researcher decided to use the Cronbach's coefficient alpha formula for item analyses and the results are revealed in the Appendix 3A. Thorndike further argues that the Cronbach's coefficient alpha, like the Kuder-Richardson Formula 20 (KR-20), in its special case, is a single-facet approach in which the analysis is carried out at the item level. If the data are in dichotomous form, in which all the items are scored either 0 or 1, the Cronbach's coefficient alpha is equivalent to a reliability coefficient KR-20. Thus, in the case under consideration there is: (a) a between-persons variance component, (b) a between-items component, and (c) an interaction-of-persons-with-items component. Table 3.2 presents the reliability coefficients of the three instruments based on the first stage of the pilot study (N=60).

Table 3.1
Reliability Coefficients of Scales

SCALE/ INSTRUMENT	CRONBACH ALPHA	SPLIT-HALF Guttman	Spearman-Brown	KR-20
1. School and School Work	.92	.83	.84	na
a. School Motivation	.77	.77	.78	na
b. Learning Approach and Style	.91	.85	.86	na
2. Rotter's I-E Locus of Control	na	.60	.62	.67
3. Life Orientation Test (LOT)	.69	.68	.69	na

* na- not applicable; KR-20 -Kuder-Richardson Formula 20

Table 3.1 shows that increased length or number of items tends to increase reliability. This is why the total test reliability of the 'School and School Work' tends to be greater (r= 0.92) than the reliability of the sub-tests (a) and (b) or the reliability when the test is split into two halves. Entwistle and Tait (1990) reported that their reliabilities of the sub-scales 'school motivation' and 'learning approach and style' lie between .51 and .73, and .46 and .77, respectively. The KR-20 reliability of Rotter's locus of control in Israeli sample, as reported by Bar-Tal *et al.* (1980) was .53, whereas, Crandall *et al.* (1965) reported that their test-retest reliability of Rotter's locus of control scales was .65. Marshall and Lang

(1990) found a Cronbach alpha reliability of .77 on the LOT scales, and another finding, Carver and Scheier's (1985) sample yielded a Cronbach alpha reliability of .76 and a test-retest reliability, also, .76 over a four-week interval. Thus, Carver and Scheier (1985) suggested that the LOT, which measures 'optimism', possesses reasonable stability across time. These results presented in Table 3.1 give salient support for the appropriateness and reliabilities of the scales when administered to a Malaysian sample, thus, giving support for its use in the main study.

According to Zeller (1988 :322), 'a measure is valid if it does what it is intended to do'. He offers his definition of validity as that which 'refers to the extent to which an empirical indicator measures what it purports to measure'. Alternatively, we could say an indicator or instrument is valid to the degree that it empirically represents the concept it purports to measure. According to him, there are three types of validity: (1) content validity which focuses upon the extent to which the content of an indicator corresponds to the content of the theoretical concept it is designed to measure; (2) criterion- related validity which focuses upon the correlation variables of interest; and (3) construct validity - focuses on the assessment of whether a particular measure relates to other measures consistent

with theoretically derived hypotheses concerning the relationships among the concepts. Wiersma (1986) stated two simpler concepts or types of validity as 'internal' validity' and 'external validity'. He refers to internal validity as ' the extent to which the results can be accurately interpreted', and the external validity as 'the extent to which the results can be generalized to populations and conditions'.

The researcher suggests that there is not much point in testing for validity of the selected instruments as these are well-established and discussed in numerous journals and publications (see Entwistle and Kozeki, 1984, 1985; Entwistle, 1988; Kozeki,1985; Meyer and Muller, 1990; Rotter, 1966; Lefcourt, 1982; Carver and Scheier, 1984,1985,1986,1988; Marshall and Lang, 1990)

Some precautions were taken, however, to ensure that the translated instruments were equally valid internally and externally in Malaysia. To ensure that the contents were accurately interpreted and that the items were phrased in sufficiently colloquial terms and that the meanings were appropriate and equivalent in the English and Malaysian versions, the researcher took the following steps:

Step 1 - Instruments were translated from English language to Bahasa Malaysia by the researcher. The translations of each item to Bahasa Malaysia were then discussed and checked with his colleagues who were competent in both languages.

Step 2 - The English versions were also given to three language lecturers, one from the Language Department of University of Malaya and two from the Faculty of Education, Universiti Pertanian Malaysia (Agriculture University of Malaysia). They were considered 'bilingual judges', working independently on separate occasions from each other. The researcher told them the purpose of the study and asked them to translate the items and instructions of the instruments to Bahasa Malaysia and to assess the appropriateness of the items for Malaysian students. The translations were finally examined by a professor at the Faculty of Education, Universiti Pertanian Malaysia, who was an expert in assessment and a competent English-Bahasa Malaysia bilingual.

Step 3 - When *Steps 1* and *2* were done, the researcher then carried out the pilot study. After the pilot study, the researcher gave the new questionnaire (in the Bahasa Malaysia version) and asked five

respondents from each school to translate the questionnaire to the English language. They were given two days to work independently on their own and returned them to their form-teacher to be collected later.

Step 4 - The respondents' translations (N=15) after the pilot study were rechecked by the bilingual judges as in *Step 2*.

Step 5 - The researcher undertook item-analyses. These were to check the suitabilities of the items in each scale contained in the instruments. Items which were less suitable or had low correlation with the whole scale were deleted (see Appendix 3D).

Step 6 - Thus, the internal and external validities of the instruments having been checked within the Malaysian culture, the instruments should be ready for use in the main study in Sarawak.

The researcher assumed that all the students within the sample were competent in Bahasa Malaysia. Although they were from different ethnic groups (different cultures, different languages), they have been using Bahasa Malaysia since the beginning of their school life as defined in the national school curriculum (refer to Table 1.1 in Chapter

I, and Appendices 1D-1E). At the stage of Form Six Lower, they must have obtained at least a credit pass, if not a distinction pass, in both previous external examinations - **Sijil Rendah Pelajaran** (Lower Certificate of Education) and **Sijil Pelajaran Malaysia** (Malaysia Certificate of Education) to qualify them to enter Form Four and Form Six Lower, respectively. Furthermore, **Bahasa Malaysia** is the national and official language and it is widely spoken by people on the streets. As a precaution, in case there might be some foreign students in the schools, who were inefficient in **Bahasa Malaysia**, they could always refer to the English version of the tests which were available on request.

As indicated in the steps discussed above the pilot study also tried to find out whether or not the items were personally relevant to students and, thereby, colloquial to Malaysian's culture and students' life background. Above all, at this early stage, it was important to ensure that the instruments were fully intelligible to the students. Thus, it was necessary to undertake item analyses to check the suitability of the items in each scale or sub-scale, whereby, the less suitable items which correlated low with the total test score of each scale were to be omitted in the main study. The item-total correlations to check the suitability of the items were done using the Cronbach alpha correlation procedure and

these results are reported in Appendix 3D. Those items with total-item correlations less than 0.20 were deleted from the scales used in the main study. The following items which were found to be unsuitable because of their low item correlation were matched with students' remarks in the previous pilot-study discussion and their translation of the instruments.

I - School and School Work

Items/ Respondents' Remarks

WAR 2 - *"Being friendly with other pupils is more important to me than competing with them".*
Respondents didn't agree with the words 'more important', but accept the words 'equally important'. This is probably because Malaysia has a highly competitive educational structure (see section 'The Present Education In Malaysia' in Chapter I) which demands high qualifications.

WAR 8 - *"People seem to find it difficult to get on well with me" (-).*
Respondents didn't agree with the word 'people' because 'people' is translated as "orang", which may means 'strangers' and 'public'. They preferred the word 'students'.

WAR 9 - *"If I do well at school, my parents always show that they are pleased with me".*

Respondents noted that their parents never seem to be satisfied with their performances. This is probably because in Malaysian culture, most parents don't 'always' show in front of their child that they are pleased with his work at school, but possibly encourage him to do better.

SOC 3 - *"There are very few teachers that I can really admire" (-).*

Respondents translated 'benar-benar' (really) as 'truly', which varies in degree. Most schools are short of well-trained, highly qualified teachers. Even if he is trained, he might be asked to teach subjects which are not his majors, thus, likely to be unable to provide ideal teaching. This is probably why not many students 'really' admire teachers.

SOC 4 - *"I feel really good when my friends can see that I've done well."*

In term of culture, respondents are very shy and don't like to show-off to their friends that they have done well.

SOC 6 - *"I don't really care what other people think about me". (-).*

Respondents preferred the word 'students' to 'people'. The word 'orang' (people) was translated as 'public' and 'strangers'. Living in an urban area or city, it is likely that they hardly know other people well or are concerned what they think about you.

COM 3 - *"I generally leave my homework until the last minute." (-).*

Almost every day there is homework. Sometimes what the teacher gives today is expected to be submitted by tomorrow. With extra curriculum activities (sports and school-club activities) in the afternoon students leave their homework until the last minute.

COM 4 - *"You can't expect pupils to come up with good ideas of their own". (-).*

Respondents agreed with this statement probably because in such schools where there are shortages of textbooks and references, students tend to rely more on teachers. Furthermore, teachers are generally authoritative and opportunity is not given for pupils to contribute

ideas probably because teachers wish to complete the syllabus on time. Thus, this approach this emphasises 'exams-oriented' teaching rather than 'ideas-oriented' one.

COM 7 - *"The things we learn at school are not of any real use to me". (-).*

Malaysian elite educational system is not vocational-orientated; it is rather an academically-orientated, whereby, subjects are geared towards fulfilling the prerequisites of the higher-education admission criteria. Thus, for example in history, human biology and geography, less emphasis is given to the application and inter-connection of the subjects to actual daily life.

Streaming of students into science and arts are, also, not based on students' own interest. Instead, they are streamed by the Government based on their SRP examination (Lower Certificate of Education) results on the basis that science products are more needed by the country (see Chapter I).

INT 2 - *"I don't feel happy having to work on my own" (-).*

Respondents agreed with the statement because in Malaysian's culture a person ought to

possess a spirit of "gotong-royong" (working together as a group). Thus, working by oneself would be perceived by the society as having a negative behaviour, equivalent to what is termed by the West as 'narcissistic'.

INT 4 - *"I spend a lot of my spare time finding out about things on my own".*

In Malaysian's culture, they are used to working together. Thus, once again the words "on my own" is not relevant for the same reason given above.

INT 8 - *"I'm expected to work out too many things on my own". (-).*

Again, they disagreed with the words "on my own" for the reason mentioned in INT 2 and INT 4 above.

CLE 1 - *"I want teachers to know that they can depend on me".*

It is inherent in Malaysian's culture that "juniors" should not outsmart the "seniors", and, in fact it is prohibited by the local custom. Anything related to this behaviour is against their taboo and believed to be immoral.

CLE 3 - *"If teachers would let pupils do whatever they want to do, I would enjoy school very much." (-).*
Respondents agreed with the statement because they considered some of the school rules are too rigid and some teachers are too strict, thus, they tend to request more independence.

CLE 9 - *"Only weak people like rules and need order". (-).*
Being grown-up students, respondents considered rules and order, which are often too rigid, as unnecessary, being the reason given in CLE 3 above.

RES 3 - *"I would rather be corrected, than left to do something wrong".*
Malaysian are not familiar with boldness and blunt correction. In Malaysian's culture, mistakes should be covertly corrected in subtle and perhaps sometimes hidden in proverbs. Thus, the item is rather incompatible to respondents' culture.

RES 5 - *"I always find a good excuse if I haven't done my homework". (-).*
Respondents agreed with the statement, probably because there are often too much homework given by each subject teacher to be done

each night. They always find a shortage of time because after school hours, at about 1.30 p.m., they have tutorial classes, sports and school-club activities. In the evening, some of them help their parents to look after their baby-brothers and to look after their family business.

RES 9 - *"A feeling of guilt is worse even than severe punishment".*

Respondents agree with the statement because punishment is usually carried out in public such as in weekly school assembly, and, this may cause great embarrassment. On the other hand, guilt feeling is sometimes positive in the Malaysian culture.

II- Life Orientation Test [LOT]

OPM 8 - *"I rarely count on good things happening to me".*

Respondents didn't agree with this statement because of their strong religious background, whereby, good and bad deeds are monitored closely by God. Thus, respondents are not oriented to become aware of what good deeds they have done.

III- Rotter's I-E Locus of Control

EXC 2 - A. *"One of the major reasons why we have wars is because people don't have enough interest in politics".*

B. *"There will always be wars, no matter how hard people try to prevent them".*

Respondents were sensitive about the word 'war'. Recent communist resurgence in Sarawak has caused peoples' life to be very miserable. Thus, due to this experience respondents might be biased in their response.

EXC 12- A. *"In my case getting what I want has little or nothing to do with luck".*

B. *"Many times we might just as well decide what to do by flipping a coin".*

EXC 22- A. *"What happen to me is my own doing".*

B. *"Sometimes I feel that I don't have enough control over the direction my life is taking".*

Respondents rejected both items EXC 12 and EXC 22 because of their strong religious background, being the reason mentioned in OPM 8.

Table 3.2

Relationship Between Learning Approaches and Motivation Among British, Hungarian* and Malaysian.

	DEEP APPROACH			SURFACE APPROACH			STRATEGIC APPROACH		
	Bri	Hun	Mal	Bri	Hun	Mal	Bri	Hun	Mal
Intrinsic Motivation	0.54	0.58	0.49	-0.17	-0.10	-0.18	0.39	0.40	0.42
Interest	0.46	0.47	0.35	-0.16	-0.06	-0.17	0.36	0.42	0.34
Competence	0.45	0.45	0.42	-0.19	-0.13	-0.16	0.46	0.46	0.46
Instrumental Motivation	-0.21	-0.34	-0.16	0.43	0.47	0.46	-0.10	-0.15	-0.09
Fear of Failure	0.08	-0.03ns	0.10	0.30	0.52	0.36	0.11	0.06	0.06
Conscientiousness	0.45	0.47	0.49	-0.03ns	0.10	-0.14	0.60	0.62	0.50
Compliance	0.40	0.36	0.34	-0.11	0.00ns	-0.04ns	0.43	0.49	0.30
Responsibility	0.28	0.26	0.31	-0.03ns	-0.10	-0.12ns	0.34	0.36	0.35
Warmth	0.29	0.25	0.26	-0.07ns	0.01ns	-0.13	0.29	0.33	0.27
Hope for Success	0.29	0.25	0.28	0.07ns	0.23	0.20	0.26	0.22	0.34
Sociability	0.24	0.19	0.26	0.00ns	-0.01ns	-0.11ns	0.18	0.20	0.26
N	614	579	256						

* British and Hungarian study adapted from Kozeki and Entwistle (1988: 251). All Significance at 0.05 and 0.01 levels, otherwise stated ns= not significant.

The second pilot study, using the wider sample, was aimed to extend previous comparative studies of the relationships between learning approaches and school motivation by Entwistle and Kozeki (1988). This former study was based on British and Hungarian samples. According to Entwistle and Kozeki (1988), there were 614 British students and 579 Hungarian students from four secondary schools in each country taking the test. They noted that there were two age groups: the British students being between 13-14 years old and the Hungarian students being between 15-17 years of age. In the case of the Malaysian sample, there were 256 students extracted from three high school in Kuching City, Sarawak. The Malaysian sample, being from lower the sixth form, were of an average age of 17 years.

Results for the current Malaysian sample in Table 3.2 show the product-moment correlation coefficients between learning approaches and school motivation and how these compare for all three nationalities. The results support the previous findings by Entwistle and Kozeki (1988) where four distinct patterns of relationship can also be seen. The first three sub-scales, "intrinsic motivation", "interest", and "competence" have strong positive correlations with both deep and strategic approaches with the higher values being with the deep approach. In contrast, they have negative correlations with a surface approach

to learning. In the second group,"instrumental motivation" showed negative correlations with both deep and strategic approaches and positive correlations with surface approach, while "fear of failure" correlated positively with a surface approach. The third group consisting of "conscientiousness", "compliance", and "responsibility", has its highest positive correlations with a strategic approach and somewhat less with a deep approach; it shows weak correlations with a surface approach. The final group, that is, the last three sub-scales, show lowest correlations with surface approach and generally high with strategic approach (especially among Malaysian) and deep approach. Overall, the first three highest values among the British are the correlations between "conscientiousness" and strategic approach, "intrinsic motivation" with deep approach, "interest" and "competence" with deep and strategic approaches, respectively. Among the Hungarian, the best three correlations are between "conscientiousness" and strategic approach, "intrinsic motivation" with deep approach, and "fear of failure" with surface approach. As for the Malaysian, the three highest correlations are also "conscientiousness" with strategic approach, "intrinsic motivation" with deep approach, and "competence" with strategic approach. As a whole, the results show considerable similarities and the Malaysian results fit in with those of the previous studies. These results give

salient support for the appropriateness and reliabilities of the scales when administered to a Malaysian sample.

3.8 Summary

This chapter has described the methods and procedures used in this study which employed a non-experimental *ex post facto*, survey-type research. Its aim is to investigate what independent variables contribute to student achievement in the SPM external examination. The dependent variable is, thus, student achievement in this public examination and the independent variables are learning approaches, learning styles, school motivation, locus of control, optimism and student's demographic variables. These selected independent variables have been reviewed in previous research literature associated with student's learning and achievement.

The ready-made instruments, measuring predictive measures, were constructed by Kozeki and Entwistle (1985), Rotter (1966) and Carver and Scheiver (1985), and were originally in English. These have been translated into Bahasa Malaysia (Malay language). A pilot study was carried out to examine if the Malay-version instruments are sufficiently colloquial, equivalent in meanings with the original ones, and are fully intelligible to Malaysian sample. The pilot sample consisted of 316 students within the lower-

sixth form in 1989 from five high schools in Kuching City. The average age of these students were seventeen years. The sample in the main study consisted of 925 lower-sixth form students, derived from all eight high schools in Kuching City in 1990.

Results from the pilot study showed that the scales in the selected instruments were highly reliable as expected although with some sub-scales certain items had to be deleted. These items with low item-total correlations were probably contradicting Malaysian culture and tradition and, thus, were omitted in the main study. The findings in a comparative study for three nationalities (British, Hungarian and Malaysian), in the pilot study, supported that of Entwistle and Kozeki (1988) and thus, as well, suggested the suitability of the scales to be used in a Malaysian context. The forthcoming chapter will reveal procedures in data analyses and present the main findings.

CHAPTER IV

DATA ANALYSIS AND FINDINGS

4.0 Introduction

Chapter III showed the organisation of research structure and strategy which has been adopted in this study. The research will not be productive, however, unless the data collected can be processed into a form suitable for presentation and analysis.

> With the burden of statistical computation removed from the researcher the practical side of research analysis takes a different form. Instead of being an arithmetician, the researcher becomes a clerk. This manifests itself in the extreme care and deligence needed in preparing the data, and in the systematic habits essential to efficient computer usage. (Youngman, 1979 :13).

The preliminary analysis of data from the pilot study, presented in the previous chapter, has already produced a number of interesting findings, some of which confirm the results of previous studies (especially the comparative study among British, Hungarian and Malaysian students). The reliabilities of the scales were as expected although with some sub-scales unexpected reliabilities occurred.

The first two sections of this chapter explain the choice of methods for classifying and processing 'raw data', and consider the computer aids available for

analysing the data. In the later sections, the researcher aims to test the hypotheses and to reveal the findings.

4.1 Data Preparation

Howell (1987) noted that to be of any use to the researcher the raw data collected in the field have to be processed. He argues that:

> A collection of raw data, taken by itself, is no more exciting or informative than is junk mail before election day. Whether the data have been neatly arranged in rows on a data collection form or have been scribbled on the back of an out-of-date announcement torn from the bulletin board, a collection of numbers is still just a collection of numbers. They must be put into some sort of logical organization if they are to be interpretable.
>
> (Howell,1987 :18)

The most convenient way of processing data these days is through the use of computer; in the case of this study employinging the SPSS^{X} package. Taylor and Hawkins (1983) noted that classification is the first stage of any processing of data, especially in the "open question" technique. It is the process whereby data on a given variable are sorted and arranged according to their characteristics. In the case of precoded questions (sometimes called "closed" technique), as employed in this study, we have assigned beforehand numerical symbols to the various answer categories. In precoded questions each answer usually carries a number and that number can be used

in analysis. Thus, as soon as the questionnaires return from the field they can be made ready for data processing. The scores are recorded directly on to coding sheets and entered into the computer data file. The "precoded questions" technique is less difficult than the "open questions" technique. In the "open questions" the raw data are in the form of words and sentences written down either by interviewer (researcher), or by the respondents, or perhaps in the form of tape recording. The researcher employing the "open qusstion", thereby, cannot start straight away with statistical analysis. According to Oppenheim (1966), the researcher, first of all, has to convert the data into numerical form which is usually done with the aid of a classification system. The process of classifying responses in this way is known as coding, followed by punching (the use of punch cards). More procedures are taken in the "open question" technique; thus, the number of transfers of data in each step is also more frequent than with the other technique. Youngman (1979) cautioned that the more times data are transferred between coding systems, the greater the risk of introducing errors. He further pointed out that a major problem in any computerised analysis is the avoidance of errors. In view of this, the researcher took adequate care in preparing the data for processing in order to retain as much as possible of the original information from the selected

instruments to meet the research objectives discussed earlier.

Scales on students' variables were designed in such a way that coding was straightforward. The students' variables could be simply defined as demographic variables such as gender (sex), ethnic group, day scholar/ boarder, academic stream, and residency (rural/urban)- which illustrate the "sociology factors". All these students' variables are fixed format coding to ensure that the same item of information appeared in the same 'card-column' (usually of 40, 60, or 80 columns) on the recording sheet. As an example, columns 1-3 for number of respondents/cases; column 4 for name of school; column 5 for academic stream; column 6 for gender, and so on. Gender was coded 1 for boy and 2 for girl. In the case of ethnic group, it was coded 1 for Malay, 2 for Iban, 3 for Melanau, 4 for Chinese, 5 for Bidayuh, and 6 for other groups. The other variables such as day scholar/boarder, academic stream (arts / science), and rural/urban student were also coded 1 or 2, respectively.

The types of items in the selected instruments (see chapter 4) had a straight forward scoring pattern and were coded in Likert's scales - running from "strongly agree" , "agree," "uncertain," "disagree," to "strongly disagree." These five positions were given simple weights of 5, 4, 3,

2, and 1,respectively, for scoring purposes in the case of positive items and vice versa where items were negatives and indicated by minus (-) signs.

Modifications were made in the coding. In the original coding, say for example in the School and School Work Inventory, the scale of learning approach has sub-scales like deep approach, surface approach and strategic approach. Each of these sub-scales has six different items (statements): thus, giving six separate codings. The six items in the deep approach sub-scale running from 'deep approach 1 (DAP 1) to 'deep approach 6 (DAP 6) were coded 5, 4, 3, 2, and 1, separately (see chapter IV). In the present study, all the six-item scores were totaled together. As such, with Likert scoring of 5, 4, 3, 2, or 1 depending on response, the maximum-minimum scores are 30 and 6 for each sub-scale. Table 4.0 presented the summary statistics of responses to the (1) School and School Work Inventory, (2) Rotter I-E Locus of Control Inventory, and (3) Life Orientation Test used in this study.

4.2 Data Analyses

The research methodology given in chapter III, which revealed the research structures and strategies, pointed out its correlational nature and the desirability of undertaking multivariate analyses. Once the data have been

processed in numerical form, we can start with the most simple methods of analyses, the tabulations, as suggested by Reese (1980). The data tabulation programmes (Codebook, Marginals, Crosstabs, Breakdown and Condescriptive) provided by the SPSS^{X} package (Nie *et al.*,1975) take away the hard work of programming. Thus, the researcher has more time for the task of preparing data and taking adequate care of selecting suitable analytical methods. The tabulation can be done by using frequency distributions of the answers of the entire sample to each question in the questionnaire. According to Taylor and Hawkins (1983), the distribution of a variable refers to its overall pattern or arrangement; the frequency is the number of times any one value of it occurs. By obtaining a frequency tabulation, according to Youngman (1979), the researcher is able to trace any non numerical characters and also any values which logically should not occur. This ensures that the data are adequately vetted before performing major analyses.

The frequency tabulations of the coded response patterns were obtained by using the SPSS^{X} codebook. The breakdown of samples in this study using the frequency tabulations method is revealed in Table 3.3 and Figures 1.3A - 1.3F in the previous chapter. The distribution information for achievement of students in each subject

area is also given in Table 4.2 later in this chapter. The mean score and standard deviation for each criterion were obtained when the '*t*' test was applied to the data and are dealt with in the forthcoming section.

4.3 Testing of Hypotheses

First, it is necessary to recall the research questions mentioned in Chapter I, as follows:

1. What are the relationships between school motivation, learning approaches, learning styles and academic achievement of students in different subject areas?

2. How does students' optimistic (or pessimistic) view of academic study relate to their learning approaches,learning styles and school motivation?

3. Are there differences in achievement between students who possess "internal" locus of control and those who possess "external" locus of control in different subject area?

4. What are the contributions to student achievement in the **Sijil Pelajaran Malaysia** (Malaysian Certificate of Education) external examination in

Malaysia of such student variables as gender, residency, day scholar/boarder, learning approaches and styles, school motivation, locus of control and control and optimism-pessimism view?

5. What are the most important predictor variables contributing to student achievement in different subject areas?

6. Are there differences in the contribution of school motivation, learning approach, learning style, locus of control and optimism to achievement within different ethnic groups?

7. What are the most important variables predicting achievement in (a) arts stream and (b) science stream?

The statistical analyses used in this study were based on two-tailed tests of significance at the 1% ($p<.01$) and 5% ($p<.05$) levels. Edwards (1946) suggested that the '*t*' test is the appropriate method in testing null hypotheses, urging that it determines whether an observed difference is of such magnitude that it cannot be attributed to chance factors or sampling variation. Connolly and Sluckin (1971) also agreed with the use of '*t*' test to assess a difference between two sample means as it

amounts to testing the null hypothesis. According to these authors, the 't' test which is appropriate in investigating differences between means of two groups, is mathematically equivalent to an analysis of variance, which is more suitable in analyses involving more than two groups.

The SPSS^{X} 't-test' sub-programme used in this study employs the pooled variance estimate t, as illustrated in Table 4.0A. With the non-pooled t, the SPSS^{X} computes degree of freedom (df) and uses it to find the probability value (Howell, 1987). Howell noted that the 't' test also supplies the F value which is the F test for homogeneity of variance (see Table 4.1). Lewis (1967) argued that a significant F ratio does not imply that all the group-mean differences are significant. He also suggested that the difference between any particular pair of group means should be tested for significance by the 't' ratio ('t' test). Appendix 4A presents the values of 't' against degree of freedom (df) for 0.05 significance and 0.01 significance levels.

Guilford (1965) and Howell (1987) illustrated several suggestions in the computation of 't'. These included testing the null hypothesis that two population means are equal in size; testing a difference between uncorrelated (independent) means; and t' for differences between

correlated (related) pairs of means. Howell (1987) noted that the independent 't' test is based on sample means from two independent samples and takes the ratio of the difference between means to the standard error of differences between these means. This was similar to Guilford's (1965) view in that the variance estimate takes care of correlated variances and variations in large and small samples alike in the finding of useable standard errors for standard deviations. Table 4.0A below is an example of a computer output using the '*t*' test.

Table 4.0A - An example of SPSS[x] *t*-test analysis of differences in fear of failure (FOF) between boys and girls.

T-TEST

GROUP 1 - SEX EQ 1
GROUP 2 - SEX EQ 2

VARIABLE	NUMBER OF CASES	MEAN	STANDARD DEVIATION	STANDARD ERROR	F VALUE	2-TAIL PROB.
FOF						
GROUP 1	363	21.1873	4.922	0.258	1.23	0.026
GROUP 2	562	22.6815	4.430	0.187		

POOLED VARIANCE ESTIMATE			SEPARATE VARIANCE ESTIMATE		
T VALUE	DEGREE OF FREEDOM	2-TAIL PROB.	T VALUE	DEGREE OF FREEDOM	2-TAIL PROB.
-4.02	923	0.000	-3.93	713.92	0.000

When we are comparing two small groups (below thirty), in order to see if the difference between them is

significant, the formula we use is as follows (Crocker, 1969:68):

$$t = \frac{M_1 - M_2}{\sqrt{\left[\left(\frac{\sum D_1^2 + \sum D_2^2}{N_1 + N_2 - 2}\right)\left(\frac{1}{N_1} + \frac{1}{N_2}\right)\right]}}$$

where M_1 = mean of scores for first group,
M_2 = mean of scores for second group,
$\sum D_1^2$ = sum of squared deviations from the mean for the first group,
$\sum D_2^2$ = sum of squared deviations from the mean for the second group,
N_1 = number of scores in first group,
N_2 = number of scores in second group.

The 't' test, as pointed out by Connolly and Sluckin (1971), is appropriate in investigating differences between means of two groups. In this study, the researcher decided to use the 't' test rather than the analysis of variance (ANOVA) because the technique is mathematically equivalent to analysis of variance, and neither procedure has any particular advantage over the other (Connolly and Sluckin, 1971). The analysis of variance is more suitable for use in analyses involving more than two groups.

In this study, the 't' tests were computed for the mixed samples: boys and girls; arts and science streams; day scholars and boarders; urban and rural students; and low and high achievers. Differences in the mean values for each independent variable are given in five separate tables as follows: Table 4.1A - academicstream (arts and

science); Table 4.1B - gender (boy and girl); Table 4.1C - day scholar and boarder; Table 4.1D - urban and rural student; and Table 4.1E - high and low achievers.

The other five tables (Table 4.2A to Table 4.2E) showed the differences in achievement in each subject area taken in the **Sijil Pelajaran Malaysia (SPM)** external examination between: Table 4.2A - academic stream (arts and science); Table 4.2B - gender (boy and girl); Table 4.2C - day scholar and boarder; Table 4.2D - urban and rural student; and Table 4.2E - high and low achievers. Each subject area taken in the **SPM** examination is classified as predicted variable and students' variables such as academic stream, gender, day scholar/boarder, residency, and achievement (SPM aggregates) are independent or predictor variables. Table 4.0B and Figure 4A show the mean score for achievement in each subject area based on the **SPM** external examination.

In this *ex post facto* research, as mentioned earlier in Chapter III, the researcher does not have direct control of the independent variables because the manifestations have already occurred (in this case, the students' academic achievement based on the **SPM** external examination results) or because they are inherently not manipulatable like gender, ethnicity, academic stream, school, residential status (day scholars/boarders), residency (urban/rural),

TABLE 4.1A

The mean differences in school motivation, learning approaches, learning styles, locus of control and optimism between academic streams (arts and science)

Arts Stream (N=593) Science Stream (N=332) Degree of freedom (df) = 923

VARIABLE	ACADEMIC STREAM	MEAN	SD	SE	*t* VALUE	SIGNIFICANCE
School Motivation:						
1. Warmth	Arts	22.67	4.90	0.20	-0.06	ns
	Science	22.69	5.17	0.28		
2. Sociability	Arts	21.82	5.01	0.21	-1.06	ns
	Science	22.16	3.92	0.22		
3. Competence	Arts	21.97	5.56	0.23	-0.17	ns
	Science	22.03	3.88	0.21		
4. Interest	Arts	23.17	4.60	0.19	-0.52	ns
	Science	23.35	5.30	0.29		
5. Responsibility	Arts	23.67	4.09	0.17	0.14	ns
	Science	23.64	4.17	0.23		
6. Compliance	Arts	22.84	4.67	0.19	-2.46	p<.05
	Science	23.66	5.08	0.28		
7. Intrinsic Motivation	Arts	22.25	5.83	0.24	0.21	ns
	Science	22.17	4.32	0.24		
8. Instrumental Motivation	Arts	19.72	5.82	0.24	-1.00	ns
	Science	20.13	6.19	0.34		
9. Fear of Failure	Arts	21.80	4.58	0.25	-1.91	ns
	Science	22.41	4.71	0.19		
10.Hope for Success	Arts	22.82	5.06	0.21	2.25	p<.05
	Science	22.08	4.46	0.25		

(Continued)

11.Conscientiousness	Arts	23.83	3.98	0.16	-3.24	p<.01
	Science	24.81	5.05	0.28		
Learning Approach:						
12.Deep Approach	Arts	23.31	3.95	0.16	-2.38	p<.05
	Science	23.99	4.58	0.25		
13.Surface Approach	Arts	19.40	5.85	0.24	-0.51	ns
	Science	19.60	5.28	0.29		
14.Strategic Approach	Arts	21.46	4.69	0.19	3.71	p<.001
	Science	20.32	4.00	0.22		
Learning Style:						
15.Holist Style	Arts	23.37	4.12	0.17	-2.35	p<.05
	Science	24.08	4.76	0.26		
16.Serialist Style	Arts	22.67	3.91	0.16	-2.58	p<.01
	Science	23.48	5.70	0.31		
17.Locus of Control	Arts	6.93	2.49	0.10	1.88	ns
	Science	6.60	2.67	0.15		
18.Optimism	Arts	26.34	3.58	0.15	3.61	p<.001
	Science	25.47	3.44	0.19		

SD- STANDARD DEVIATION; SE- STANDARD ERROR; ns- NOT SIGNIFICANT (p<.05, p<.01, p<.001).

TABLE 4.18

The mean differences in school motivation, learning approaches, learning styles, locus of control and optimism between gender (boy and girl)

Boys (N=363) Girls (N=562) df =923

VARIABLE	GENDER	MEAN	SD	SE	*t* VALUE	SIGNIFICANCE
School Motivation:						
1. Warmth	Boys	22.84	6.15	0.32	0.83	ns
	Girls	22.56	4.08	0.17		
2. Sociability	Boys	22.15	5.96	0.31	1.08	ns
	Girls	21.81	3.56	0.15		
3. Competence	Boys	22.04	6.60	0.35	0.23	ns
	Girls	21.96	3.65	0.15		
4. Interest	Boys	23.34	6.03	0.32	0.52	ns
	Girls	23.17	3.94	0.17		
5. Responsibility	Boys	23.34	5.03	0.26	-1.88	ns
	Girls	23.87	3.38	0.14		
6. Compliance	Boys	23.06	6.39	0.34	-0.40	ns
	Girls	23.19	3.48	0.15		
7. Intrinsic Motivation	Boys	22.22	6.46	0.34	-0.01	ns
	Girls	22.23	4.47	0.19		
8. Instrumental Motivation	Boys	20.10	6.37	0.34	0.96	ns
	Girls	19.71	5.67	0.24		
9. Fear of Failure	Boys	21.43	4.92	0.26	-4.02	p<.001
	Girls	22.68	4.43	0.19		
10.Hope for Success	Boys	22.72	6.00	0.32	0.81	ns
	Girls	22.45	3.97	0.17		

(Continued)

11.Conscientiousness	Boys	23.81	5.42	0.28	-2.03	p<.05
	Girls	24.41	3.61	0.15		
Learning Approach:						
12.Deep Approach	Boys	23.62	4.52	0.24	0.40	ns
	Girls	23.51	3.98	0.17		
13.Surface Approach	Boys	19.86	7.09	0.37	1.67	ns
	Girls	19.23	4.47	0.19		
14.Strategic Approach	Boys	21.19	5.17	0.27	0.76	ns
	Girls	20.96	3.99	0.17		
Learning Style:						
15.Holist Style	Boys	24.19	5.31	0.28	3.16	p<.01
	Girls	23.26	3.59	0.15		
16.Serialist Style	Boys	22.83	5.89	0.31	-0.67	ns
	Girls	23.04	3.62	0.15		
17.Locus of Control	Boys	6.60	2.64	0.14	-2.04	p<.05
	Girls	6.95	2.50	0.11		
18.Optimism	Boys	26.15	3.73	0.20	0.82	ns
	Girls	25.95	3.44	0.15		

SD- STANDARD DEVIATION; SE- STANDARD ERROR; df- DEGREE OF FREEDOM; ns- NOT SIGNIFICANT (p<.05, p<.01, p<.001).

size of family and parents' education. These independent variables are the predictors. Other independent variables such as dimensions of school motivation, approaches and styles of learning, locus of control and optimism are equally difficult to manipulate. Appendix 4C reveals the summary statistics of responses to the School and School Work Inventory, Rotter's I-E Locus of Control Inventory, and Life Orientation Test employed in this study.

Some features of Table 4.1A and Table 4.1B merit comment.

a. Table 4.1A shows that mean scores among the science students are significantly higher than the arts students in the following school motivation variables:

   - "compliance" - compliance with responsible demands (means= 23.66 for science students, 22.84 for arts students; $t= 2.46$; $p<.05$).
   - "conscientiousness" - determination to carry out what is expected as well as possible, even if it interferes with more immediately pleasurable activities (means= 24.81 for science students, 23.83 for arts students; $t= 3.24$; $p<.01$).

In contrast, the mean scores among the arts students are significantly higher than science students in

   - "hope for success" - competitive, determined to do better than others, so as to maintain a high level

of self-esteem (means= 22.82 for arts students, 22.08 for science students; t= 2.25; $p<.05$).

For learning approaches and styles, the mean scores among the science students are significantly higher than the arts students in:

- "deep approach" - looks for meaning, interacts actively, links with real life, adopt an independent and critical stance towards knowledge (means= 23.99 for science students, 23.31 for arts students; t= 2.38; $p<.05$).
- "holist style" - relate new ideas and concepts to previous knowledge and everyday experience (means= 24.08 for science students, 23.37 for arts students; t= 2.35; $p<.05$).
- "serialist style" - relate evidence to conclusions and examine the logic of the argument (means= 23.48 for science students, 22.67 for arts students; t= 2.56; $p<.01$).

The mean score among the arts students are significantly higher than the science students in:

- "strategic approach" - actively seeks information about assessment requirement, intends to get the best grades possible by being well-organized, making effective use of time, seeks out appropriate working conditions and tries

to impress individual teachers (means= 21.46 for arts students, 20.32 for science students, t= 3.71; $p<.01$).

- "Optimism" - emphasizes students' expectation of good rather than bad things will happen to them. This scale is scored in the optimistic direction, that is the higher the score the more optimistic the individual. The results in Table 4.1A show that the arts students have a significantly higher mean score in "optimism"than the science students (means= 26.34 for arts students, 25.47 for science students; t= 3.61; $p<.01$).

b. Table 4.1B shows that the mean score among the girls are significantly higher than boys in the following school motivation:

- "fear of failure" - anxiously aware of assessment, lack in self-confidence, and worries about being behind with work or doing worse than others (means= 22.68 for girls,21.43 for boys; t= 4.02; $p<.001$).
- "conscientiousness" , where mean score for girls is 24.41 and for boys is 23.81; t= 2.03 at $p<.05$.

In terms of learning style, particularly the "holist style", boys have a significantly higher mean score than

TABLE 4.1C

The mean differences in school motivation, learning approaches, learning styles, locus of control and optimism between day scholars (non-residential students) and boarders (residential students

Day Scholars (N=614) *Boarders (N=311)* *df= 923*

VARIABLE	RESIDENTIAL STATUS	MEAN	SD	SE	*t* VALUE	SIGNIFICANCE
School Motivation:						
1. Warmth	Day Scholars	22.46	5.60	0.23	-1.82	ns
	Boarders	23.09	3.49	0.20		
2. Sociability	Day Scholars	21.96	5.11	0.21	0.09	ns
	Boarders	21.93	3.59	0.20		
3. Competence	Day Scholars	21.91	5.59	0.23	-0.64	ns
	Boarders	22.14	3.62	0.21		
4. Interest	Day Scholars	23.45	5.46	0.22	1.96	p<.05
	Boarders	22.80	3.35	0.19		
5. Responsibility	Day Scholars	23.51	4.47	0.18	-1.60	ns
	Boarders	23.97	3.27	0.19		
6. Compliance	Day Scholars	23.32	5.37	0.22	1.66	ns
	Boarders	22.77	3.51	0.20		
7. Intrinsic Motivation	Day Scholars	22.19	5.84	0.24	-0.24	ns
	Boarders	22.28	4.19	0.24		
8. Instrumental Motivation	Day Scholars	20.16	6.35	0.26	2.14	p<.05
	Boarders	19.28	5.03	0.29		
9. Fear of Failure	Day Scholars	21.90	4.97	0.20	-2.68	p<.01
	Boarders	22.77	3.96	0.23		
10.Hope for Success	Day Scholars	22.39	5.35	0.22	-1.48	ns
	Boarders	22.89	3.71	0.21		

(Continued)

11.Conscientiousness	Day Scholars	24.25	4.69	0.19	0.73	ns
	Boarders	24.03	3.84	0.22		
Learning Approach:						
12.Deep Approach	Day Scholars	23.53	4.36	0.18	-0.21	ns
	Boarders	23.59	3.86	0.22		
13.Surface Approach	Day Scholars	19.68	6.21	0.25	1.59	ns
	Boarders	19.06	4.32	0.25		
14.Strategic Approach	Day Scholars	20.73	4.85	0.20	-3.09	p<.01
	Boarders	21.68	3.59	0.21		
Learning Style:						
15.Holist Style	Day Scholars	23.69	4.70	0.19	0.62	ns
	Boarders	23.50	3.64	0.21		
16.Serialist Style	Day Scholars	23.00	5.07	0.20	0.40	ns
	Boarders	22.87	3.67	0.21		
17.Locus of Control	Day Scholars	6.70	2.56	0.10	-1.86	ns
	Boarders	7.03	2.56	0.15		
18.Optimism	Day Scholars	25.77	3.60	0.15	-3.04	p<.01
	Boarders	26.52	3.42	0.19		

SD- STANDARD DEVIATION; SE- STANDARD ERROR; ns- NOT SIGNIFICANT (p<.05, p<.01, p<.001).

TABLE 4.1D

The mean differences in school motivation, learning approaches, learning styles, locus of control and optimism between urban and rural students.

Urban Students (N=549) *Rural Students (N=376)* *df= 923*

VARIABLE	URBAN/ RURAL	MEAN	SD	SE	*t* VALUE	SIGNIFICANCE
School Motivation:						
1. Warmth	Urban	22.50	5.63	0.24	-1.09	ns
	Rural	22.85	3.59	0.19		
2. Sociability	Urban	22.06	5.27	0.23	1.00	ns
	Rural	21.75	3.52	0.18		
3. Competence	Urban	22.00	5.66	0.24	0.17	ns
	Rural	21.94	3.88	0.20		
4. Interest	Urban	23.56	5.51	0.24	2.30	p<.05
	Rural	22.82	3.54	0.18		
5. Responsibility	Urban	23.67	4.20	0.18	0.46	ns
	Rural	23.55	3.47	0.18		
6. Compliance	Urban	23.33	5.31	0.23	1.88	ns
	Rural	22.75	3.49	0.18		
7. Intrinsic Motivation	Urban	22.39	5.82	0.25	1.18	ns
	Rural	21.97	4.54	0.23		
8. Instrumental Motivation	Urban	20.16	6.02	0.26	2.41	p<.05
	Rural	19.26	4.87	0.25		
9. Fear of Failure	Urban	21.93	5.09	0.22	-1.98	p<.05
	Rural	22.55	3.93	0.20		
10.Hope for Success	Urban	22.39	5.39	0.23	-1.07	ns
	Rural	22.73	3.68	0.19		

(Continued)

11.Conscientiousness	Urban	24.37	3.81	0.16	2.55	p<.05
	Rural	23.72	3.89	0.20		
Learning Approach:						
12.Deep Approach	Urban	23.53	3.91	0.17	0.32	ns
	Rural	23.45	3.89	0.20		
13.Surface Approach	Urban	19.62	6.34	0.27	1.00	ns
	Rural	19.24	4.41	0.23		
14.Strategic Approach	Urban	20.87	4.87	0.21	-1.42	ns
	Rural	21.30	3.86	0.20		
Learning Style:						
15.Holist Style	Urban	23.82	4.31	0.18	2.24	p<.05
	Rural	23.21	3.67	0.19		
16.Serialist Style	Urban	23.10	4.23	0.18	1.91	ns
	Rural	22.58	3.81	0.20		
17.Locus of Control	Urban	6.67	2.58	0.11	-2.05	p<.05
	Rural	7.02	2.52	0.13		
18.Optimism	Urban	25.73	3.55	0.15	-3.10	p<.01
	Rural	26.46	3.53	0.18		

SD- STANDARD DEVIATION; SE- STANDARD ERROR; ns- NOT SIGNIFICANT (p<.05, p<.01, p<.001).

girls (means= 24.19 for boys, 23.26 for girls; t= 3.16; $p<.01$).

Table 4.1B also reveals that girls have a significantly higher mean score than boys on "locus of control" (means= 6.95 for girls, 6.60 for boys; t= 2.04; $p<.05$). Since the scale is scored in the "external" direction (the higher the score the more "external" the individual),this result implies that girls are significantly more external than boys. Thus, girls see their achievement as likely to be simply as the result of luck or environmental conditions.

From the results given in Tables 4.1C to 4.1E, the following information could be gathered:

c. Considering differences between day scholars and boarders in Table 4.1C, the day scholars have significantly higher mean scores in the following school motivation:
   - "interest" - satisfaction with school and interest in school activities (means= 23.45 for day scholars, 22.80 for boarders; t= 1.96; $p<.05$).
   - "instrumental motivation" -interested in qualifications, and in their vocational and economic opportunities; works only because of external pressures (means= 20.16 for day

scholars, 19.28 for boarders; t= 2.41; $p<.05$). But in "fear of failure", the boarders have a significantly higher mean score than the day scholars (means= 22.77 for boarders, 21.90 for day scholars; t= 2.68; $p<.01$).

In regard to learning approaches, the boarders have a significantly higher mean score in "strategic approach" than the day scholars (means= 21.68 for boarders, 20.73 for day scholars; t= 3.09; $p<.01$).

In "optimism", the boarders have a significantly higher mean score than the day scholars (means= 26.52 for boarders, 25.77 for day scholars; t= 3.04; $p<.01$).

d. In Table 4.1D, it is revealed that the urban students have significantly higher mean scores than their counterparts from rural communities in terms of:

- "interest" (means= 23.56 for urban students, 22.82 for rural students; t= 2.30; $p<.05$).
- "instrumental motivation" (means= 20.16 for urban students, 19.26 for rural students; t= 2.41; $p<.05$).
- "conscientiousness" (means= 24.37 for urban students, 23.72 for rural students; t= 2.55; $p<.05$).

Contrarily, rural students have a significantly higher

mean score than urban students in "fear of failure" where the means are 22.55 and 21.93, respectively. The 't' value is 2.41 which is significant at the 5 percent level ($p<.05$).

There are no significant mean differences in learning approaches between urban and the rural students, except in learning style. It is found that the urban students have a significantly higher mean score than the rural students in "holist style" (means= 23.82 for urban students, 23.21 for rural students; $t= 2.24$; $p<.05$).
Table 4.1D also shows that rural students have a significantly higher mean score than their urban colleagues in "optimism" (means= 26.46 for rural students,25.73 for urban students; $t= 3.10$; $p<.01$).

With "locus of control" , rural students are significantly more "external" than urban students - means= 7.02 for rural students, 6.67 for urban students; $t= 2.05$; $p<.05$.

e. Table 4.1E provides the mean differences in school motivation, learning approaches and styles between high and low achievers. Based on the **Sijil Pelajaran Malaysia** external examination results, the high achievers are defined as those who

obtained Grade One (having a total aggregate of less than 24 units). The low achievers are those who obtained Grades Two and Three, with a total aggregate of 24 units and above. These aggregates are based on any six best subjects, including at least a credit pass in **Bahasa Malaysia** - the national language.

As presented in Table 4.1E, the low achievers have significantly higher mean scores than high achievers in the following school motivation variables:

- "fear of failure" (means= 22.74 for low achievers, 21.66 for high achievers; t= 3.54; $p<.001$).
- "hope for success" (means= 22.96 for low achievers, 22.24 for high achievers; t= 2.27; $p<.05$).

In regard to learning approaches and styles, the low achievers also have a significantly higher mean score than high achievers in "strategic approach" (means= 21.55 for low achievers, 20.58 for high achievers; t= 3.30; $p<.001$). In contrast, high achievers have a significantly higher mean score in "serialist style" (means= 23.35 for high achievers and 22.56 for low achievers, respectively; t= 2.60; $p<.01$).

With "optimism", low achievers seem to be more optimistic than high achievers as their mean score are significantly higher than high achievers

TABLE 4.1E

The mean differences in school motivation, learning approaches, learning styles, locus of control and optimism between high achievers and low achievers

High Achievers (N=489) Low Achievers (N=436) df= 923

VARIABLE	ACHIEVEMENT LEVEL	MEAN	SD	SE	*t* VALUE	SIGNIFICANCE
School Motivation:						
1. Warmth	High	22.57	4.72	0.22	-0.63	ns
	Low	22.77	5.28	0.25		
2. Sociability	High	21.74	4.00	0.18	-1.43	ns
	Low	22.18	5.28	0.25		
3. Competence	High	21.88	3.70	0.17	-0.25	ns
	Low	21.95	5.17	0.25		
4. Interest	High	23.02	4.87	0.22	-1.41	ns
	Low	23.47	4.86	0.23		
5. Responsibility	High	23.60	3.96	0.18	-0.33	ns
	Low	23.69	4.21	0.20		
6. Compliance	High	23.27	4.66	0.21	1.12	ns
	Low	22.92	4.83	0.23		
7. Intrinsic Motivation	High	21.87	4.36	0.20	-1.83	ns
	Low	22.45	5.31	0.25		
8. Instrumental Motivation	High	19.99	5.92	0.27	0.61	ns
	Low	19.75	5.99	0.29		
9. Fear of Failure	High	21.66	4.55	0.21	-3.54	p<.001
	Low	22.74	4.65	0.22		
10. Hope for Success	High	22.24	4.19	0.19	-2.27	p<.05
	Low	22.96	5.41	0.26		

(Continued)

11.Conscientiousness	High	24.35	4.72	0.21	1.28	ns
	Low	23.97	4.05	0.19		
Learning Approach:						
12.Deep Approach	High	23.64	4.44	0.20	0.79	ns
	Low	23.43	3.89	0.19		
13.Surface Approach	High	19.43	5.00	0.23	0.24	ns
	Low	19.35	5.25	0.25		
14.Strategic Approach	High	20.58	3.87	0.18	-3.30	p<.001
	Low	21.55	5.02	0.24		
Learning Style:						
15.Holist Style	High	23.73	4.49	0.20	1.09	ns
	Low	23.43	3.84	0.18		
16.Serialist Style	High	23.35	5.12	0.23	2.60	p<.01
	Low	22.56	3.98	0.19		
17.Locus of Control	High	6.81	2.70	0.12	0.12	ns
	Low	6.82	2.39	0.12		
18.Optimism	High	25.57	3.35	0.15	-4.14	p<.001
	Low	26.53	3.71	0.18		

SD- STANDARD DEVIATION; SE- STANDARD ERROR; ns- NOT SIGNIFICANT (p<.05, p<.01, p<.001).

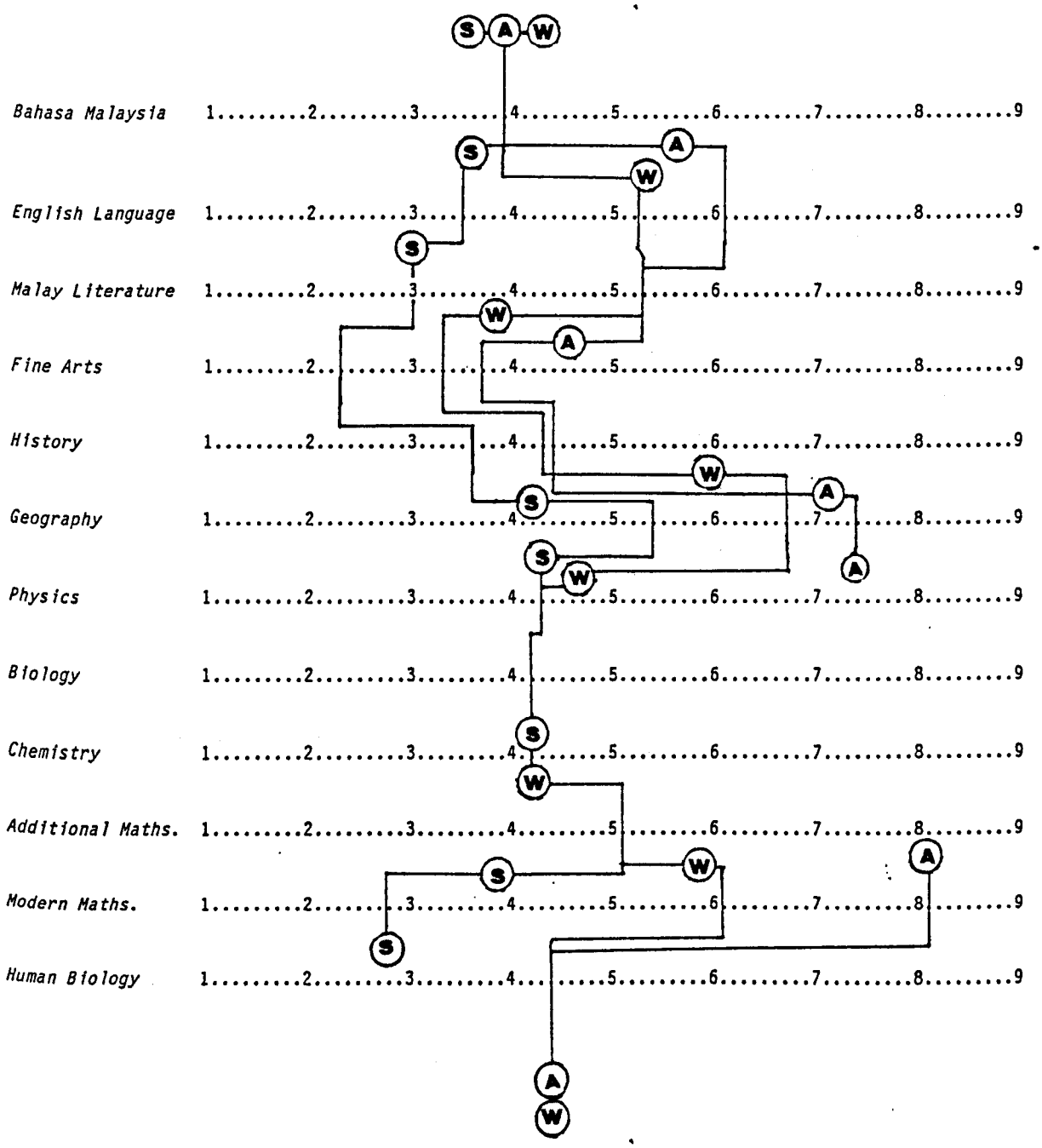
TABLE 4.0B

The Mean Score of Students' Achievement In Each Subject Area
Based On The Sijil Pelajaran Malaysia (SPM) External Examination

SUBJECT	STUDENTS OF SCIENCE STREAM N	MEAN	SD	STUDENTS OF ARTS STREAM N	MEAN	SD	WHOLE SAMPLES (Science and Arts N	MEAN	SD
1. Bahasa Malaysia (Malay Language)	332	3.98	1.53	593	3.98	1.47	925	3.98	1.49
2. English Language	332	3.47	2.08	593	6.18	2.30	925	5.21	2.58
3. Malay Literature	4	3.00	1.63	466	5.33	2.05	470	5.31	2.05
4. Fine Arts	143	2.34	1.46	379	3.70	1.72	522	3.33	1.76
5. History	19	3.68	2.24	517	4.39	1.92	536	4.32	2.00
6. Geography	308	5.44	1.85	500	7.47	1.52	808	6.70	1.92
7. Physics	332	4.31	2.27	---	---	---	332	4.31	2.27
8. Biology	332	4.25	2.04	---	---	---	332	4.25	2.04
9. Chemistry	332	4.23	2.40	---	---	---	332	4.23	2.40
10. Additional Mathematics	332	5.11	2.59	---	---	---	332	5.11	2.59
11. Modern Mathematics	324	2.84	1.91	558	8.10	1.71	882	6.17	3.10
12. Human Biology	---	---	---	240	4.44	1.93	240	4.44	1.93
13. Elementary Islamic Knowledge	43	2.95	1.75	317	3.51	1.81	360	3.45	1.81
14. Advanced Islamic Knowledge	---	---	---	120	3.72	1.71	120	3.72	1.71
15. Arabic Language	---	---	---	120	8.58	1.25	120	8.58	1.25
16. Chinese Language	89	4.11	1.90	40	5.88	2.30	129	4.66	2.19
17. Commerce	11	4.18	2.52	279	5.67	2.15	290	5.61	2.18
18. General Science	---	---	---	168	5.46	2.08	168	5.46	2.08
19. Principles of Accountancy	---	---	---	15	5.71	2.05	15	5.71	2.05

The scoring ranges from 1 (the highest/distinction) to 9 (the lowest/failed). Lower mean score for achievement in each subject area implies that the students perform at a high achievement level. The symbol '---' indicates that the group are not taking that particular subjects.

FIGURE 4A
Profile of means of students' achievement in each subject area based on the Sijil Pelajaran Malaysia external examination



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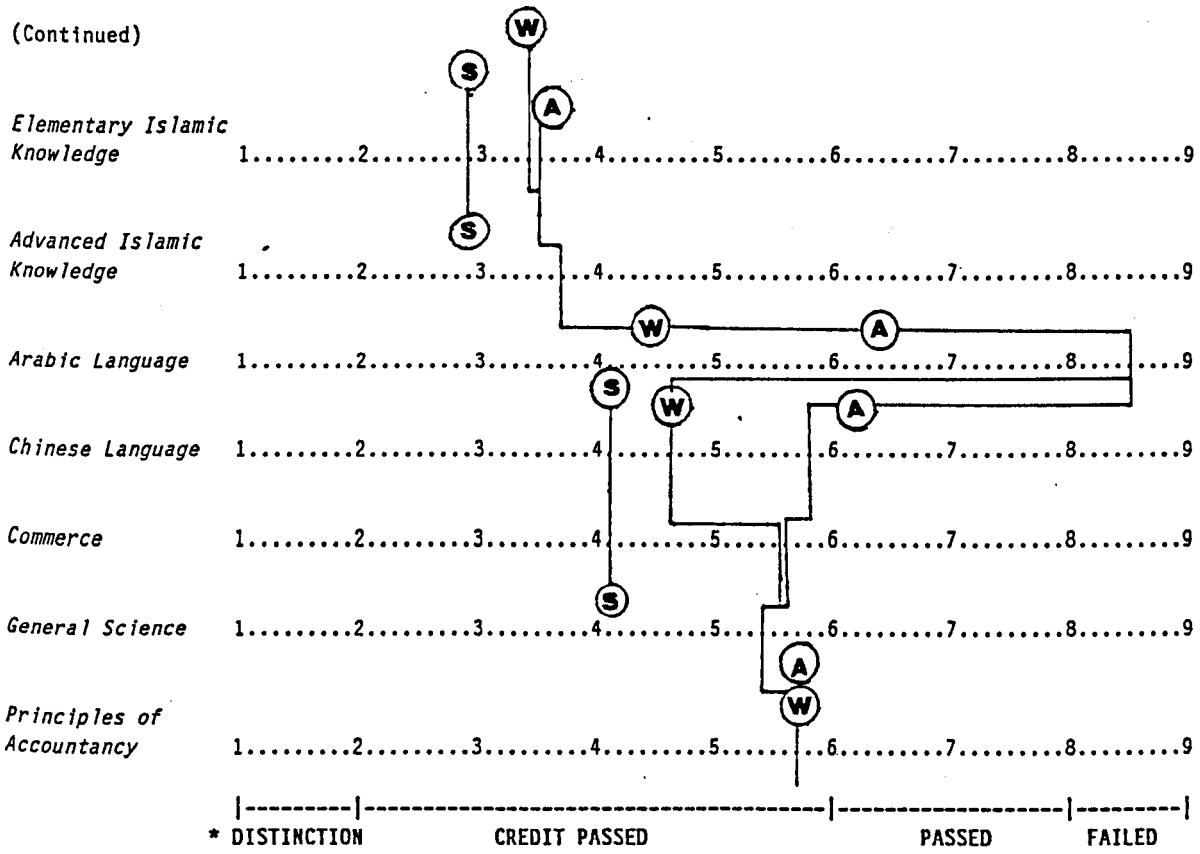


(S) *Students of Science Stream;* (A) *Students of Arts Stream;* (W) *Whole Samples (Science & Arts Streams)*

(* as classified by the Malaysian Examination Board, 1989).

(means= 26.53 for low achievers and 25.57 for high achievers; t= 4.14; $p<.001$).

Some features from Tables 4.2A to 4.2E merit comment. Note that for each of the subject area in the **Sijil Pelajaran Malaysia (SPM)** external examination the scoring ranges from 1 (the highest, distinction unit) to 9 (the lowest or failed unit). Thus, in the following tables a low mean score for achievement implies the group perform at a high achievement level (see Table 4.0B and Figure 4A).

a. In Table 4.2A, the results show that science students have a significantly higher mean score than arts students in the following subject areas:
   - In Modern Mathematics (mean= 2.84; t= 42.14; $p<.001$), compared to arts students whose mean score is only 8.10, which is, almost at failure stage.
   - In the Malay Language the mean scores for both arts and science students are about the same and hence no significant differences, but in English Language science students have a significantly higher mean score than arts students (means= 3.00 for science students, 6.18 for arts students; t= 17.75; $p<.001$).
   - In Fine Arts (means= 2.34 for science students, 3.70 for arts students; t= 8.44; $p<.001$).
   - In Geography (means= 5.44 for science students, 7.47

TABLE 4.2A

The mean differences in achievement in each subject area between academic stream (arts and science)

VARIABLE	ACADEMIC STREAM	N	MEAN	SD	SE	*t* VALUE	df	SIGNIFICANCE
1. Bahasa Malaysia (Malay Language)	Arts	593	3.99	1.47	0.06	0.10	923	ns
	Science	332	3.98	1.53	0.08			
2. English Language	Arts	593	6.18	2.30	0.10	17.75	923	p<.001
	Science	332	3.47	2.08	0.12			
3. Malay Literature	Arts	466	5.33	2.05	0.10	1.26	468	ns
	Science	4	3.00	1.63	0.82			
4. Fine Arts	Arts	379	3.70	1.72	0.09	8.44	520	p<.001
	Science	143	2.34	1.46	0.12			
5. History	Arts	517	4.34	2.00	0.09	1.41	534	ns
	Science	19	3.68	2.24	0.51			
6. Geography	Arts	500	7.47	1.52	0.07	16.99	806	p<.001
	Science	308	5.44	1.85	0.11			
7. Modern Mathematics	Arts	558	8.10	1.71	0.07	42.14	880	p<.001
	Science	324	2.84	1.92	0.11			
8. Elementary Islamic Knowledge	Arts	317	3.52	1.81	0.10	1.91	358	ns
	Science	43	2.95	1.75	0.27			
9. Chinese Language	Arts	40	5.88	2.30	0.36	4.55	127	p<.001
	Science	89	4.11	1.90	0.20			
10. Commerce	Arts	279	5.67	2.15	0.13	2.23	288	p<.05
	Science	11	4.18	2.52	0.76			

***Note** : Subjects excluded (Physics; Boilogy; Chemistry; Additional Mathematics; Human Biology; Arabic Language; Advanced Islamic Knowledge; General Science; Principles of Accountancy) are not related to either Arts Stream or Science Stream.*

TABLE 4.2B
The difference in achievement in each subject area
between gender (boy and girl

PREDICTOR VARIABLE	CRITERION VARIABLE	N	MEAN	SD	SE	*t* VALUE	df	SIGNIFICANCE
1. Bahasa Malaysia (Malay Language)	Boys	363	4.10	1.51	0.08	1.87	923	ns
	Girls	562	3.91	1.48	0.06			
2. English Language	Boys	363	5.50	2.61	0.14	2.78	923	p<.01
	Girls	562	5.02	2.53	0.11			
3. Malay Literature	Boys	163	5.59	2.10	0.16	2.14	468	p<.05
	Girls	307	5.16	2.03	0.12			
4. Fine Arts	Boys	222	3.38	1.84	0.12	0.57	520	ns
	Girls	300	3.29	1.70	0.10			
5. History	Boys	205	4.01	1.87	0.13	-2.83	534	p<.01
	Girls	331	4.51	2.07	0.11			
6. Geography	Boys	316	6.71	1.92	0.11	0.14	806	ns
	Girls	492	6.69	1.93	0.09			
7. Physics	Boys	137	4.07	2.34	0.20	-1.51	351	ns
	Girls	195	4.46	2.21	0.16			
8. Biology	Boys	137	4.23	2.08	0.18	-0.37	351	ns
	Girls	195	4.31	1.98	0.14			
9. Chemistry	Boys	137	4.32	2.58	0.22	0.37	351	ns
	Girls	195	4.22	2.32	0.17			
10 Additional Mathematics	Boys	137	5.16	2.75	0.24	0.28	351	ns
	Girls	195	5.08	2.48	0.18			

(Continued)

11.Modern Mathematics	Boys	342	6.08	3.15	0.17	-0.69	880	ns
	Girls	540	6.22	3.07	0.13			
12. Human Biology	Boys	96	4.65	1.95	0.20	1.39	241	ns
	Girls	147	4.29	1.94	0.16			
13. Elementary Islamic Knowledge	Boys	152	3.56	1.99	0.61	1.00	358	ns
	Girls	208	3.37	1.68	0.12			
14. Advanced Islamic Knowledge	Boys	48	3.79	1.75	0.25	0.42	119	ns
	Girls	73	3.66	1.69	0.20			
15. Arabic Language	Boys	46	8.65	1.27	0.19	0.49	115	ns
	Girls	71	8.54	1.24	0.15			
16. Chinese Language	Boys	36	4.78	2.42	0.40	0.38	127	ns
	Girls	93	4.61	2.10	0.22			
17. Commerce	Boys	107	5.67	2.18	0.21	0.37	288	ns
	Girls	183	5.57	2.19	0.16			
18. General Science	Boys	57	5.72	1.93	0.26	1.14	166	ns
	Girls	111	5.33	2.16	0.21			
19. Principles of Accountancy	Boys	9	4.56	2.40	0.80	-1.87	13	ns
	Girls	6	6.67	1.63	0.67			

N- NUMBER OF CASES; SD- STANDARD DEVIATION; SE- STANDARD ERROR; df- DEGREE OF FREEDOM; ns- NOT SIGNIFICANT ($p<.05$, $p<.01$, $p<.001$).

TABLE 4.2C

The difference in achievement in each subject area between day scholars (non-residential students) and boarders (residential Students)

PREDICTOR VARIABLE	CRITERION VARIABLE	N	MEAN	SD	SE	*t* VALUE	df	SIGNIFICANCE
1. Bahasa Malaysia (Malay Language)	D/Scholars	614	4.18	1.50	0.06	5.68	923	p<.001
	Boarders	311	3.60	1.39	0.08			
2. English Language	D/Scholars	614	4.22	2.36	0.10	-19.32	923	p<.001
	Boarders	311	7.15	1.75	0.10			
3. Malay Literature	D/Scholars	206	5.41	2.13	0.15	0.90	468	ns
	Boarders	264	5.23	2.00	0.12			
4. Fine Arts	D/Scholars	373	3.15	1.81	0.10	-3.70	520	p<.001
	Boarders	149	3.77	1.52	0.13			
5. History	D/Scholars	324	4.27	2.08	0.12	-0.76	534	ns
	Boarders	212	4.40	1.89	0.13			
6. Geography	D/Scholars	570	6.50	1.94	0.08	-4.64	806	p<.001
	Boarders	238	7.18	1.82	0.12			
7. Physics	D/Scholars	288	4.06	2.16	0.13	-5.18	351	p<.001
	Boarders	46	5.89	2.36	0.36			
8. Biology	D/Scholars	288	4.12	2.00	0.12	-3.88	351	p<.001
	Boarders	46	5.36	1.87	0.28			
9. Chemistry	D/Scholars	288	4.00	2.28	0.13	-5.22	351	p<.001
	Boarders	46	5.98	2.70	0.12			
10. Additional Mathematics	D/Scholars	288	4.84	2.50	0.15	-4.99	351	p<.001
	Boarders	46	6.93	2.49	0.39			

(Continued)

11. Modern Mathematics	D/Scholars	591	5.31	3.19	0.13	-12.71	880	p<.001
	Boarders	291	7.91	1.99	0.12			
12. Human Biology	D/Scholars	128	3.93	1.97	0.17	-4.41	241	p<.001
	Boarders	115	4.99	1.77	0.17			
13. Elementary Islamic Knowledge	D/Scholars	170	3.76	1.87	0.14	3.18	358	p<.01
	Boarders	190	3.16	1.71	0.12			
14. Advanced Islamic Knowledge	D/Scholars	5	4.80	2.78	1.24	1.47	119	ns
	Boarders	116	3.67	1.65	0.15			
15. Arabic Language	D/Scholars	4	5.25	3.30	1.65	-6.27	115	p<.001
	Boarders	113	8.70	0.95	0.09			
16. Chinese Language	D/Scholars	117	4.55	2.16	0.20	-1.83	127	ns
	Boarders	12	5.75	2.26	0.65			
17. Commerce	D/Scholars	246	5.56	2.27	0.14	-0.99	288	ns
	Boarders	44	5.91	1.61	0.24			
18. General Science	D/Scholars	65	4.88	2.25	0.28	-2.97	166	p<.01
	Boarders	103	5.84	1.89	0.19			
19. Principles of Accountancy	D/Scholars	6	4.33	3.08	1.26	-1.52	13	ns
	Boarders	9	6.11	1.45	0.48			

N- NUMBER OF CASES; SD- STANDARD DEVIATION; SE- STANDARD ERROR; df- DEGREE OF FREEDOM; N.S- NOT SIGNIFICANT (p<.05, p<.01, p<.001).

for arts students; t= 16.99; $p<.001$).

- In Chinese Language (means= 4.11 for science students, 5.88 for arts students; t= 4.55; $p<.001$).
- In Commerce (means= 4.18 for science students, 5.67 for arts students; t= 2.23; $p<.05$).

b. Table 4.2B reveals that significant mean differences exist between boys and girls in English Language, Malay Literature and History. Girls have significantly higher mean scores than boys in the two of the following subjects:

- English Language (means= 5.02 for girls, 5.50 for boys; t= 2.78; $p<.01$).
- Malay Literature (means= 5.16 for girls, 5.59 for boys; t= 2.14; $p<.05$).

In History boys have a significantly higher mean score than girls (means= 4.01 for boys, 4.51 for girls; t= 2.83; $p<.01$).

c. Looking at Table 4.2C, day scholars have a significantly higher mean score than boarders in almost all subject areas, except in *Bahasa Malaysia* (Malay Language) and Elementary Islamic Knowledge. The significant mean differences in achievement in these subject areas are as follows. Note that a lower mean implies higher achievement level:

- In English Language (means= 4.22 for day scholars,

7.15 for boarders; t= 19.32; $p<.001$).

- In Fine Arts subject (means= 3.15 for day scholars, 3.77 for boarders; t= 3.70; $p<.001$).
- In Geography (means= 6.50 for day scholars, 7.18 for boarders; t= 4.64; $p<.001$).
- In Modern Mathematics (means= 5.31 for day scholars, 7.91 for boarders; t= 12.71; $p<.001$).
- In science subjects like Physics, Biology, Chemistry and Additional Mathematics, day scholars also achieve better than the boarders as their mean score are significantly higher. Physics (means= 4.06, 5.89; t= 5.18; $p<.001$); Biology (means= 4.12, 5.36; t= 3.88; $p<.001$); Chemistry (means= 4.00, 5.98; t= 3.88; $p<.001$); and Additional Mathematics (means= 4.84, 6.93; t= 4.99; $p<.001$).
- In Human Biology (means= 3.93 for day scholars, 4.99 for boarders; t= 4.41; $p<.001$).
- In Arabic Language (means= 5.25 for day scholars, 8.70 for boarders; t= 6.27; $p<.001$).
- In General Science (means=4.88 for day scholars, 5.84 for boarders; t= 2.97; $p<.01$).

In contrast, boarders have significantly higher mean scores than day scholars in two subject areas as below:

- Bahasa Malaysia (Malay Language) (means= 3.60 for boarders, 4.18 for day scholars; t= 5.68; $p<.001$).

TABLE 4.2D

The difference in achievement in each subject area between urban and rural students

PREDICTOR VARIABLE	CRITERION VARIABLE	N	MEAN	SD	SE	*t* VALUE	df	SIGNIFICANCE
1. Bahasa Malaysia (Malay Language)	Urban	549	4.14	1.47	0.06	3.94	923	p<.001
	Rural	376	3.75	1.49	0.08			
2. English Language	Urban	549	4.07	2.36	0.10	-19.13	923	p<.001
	Rural	376	6.86	1.89	0.10			
3. Malay Literature	Urban	173	5.53	2.10	0.16	1.68	467	ns
	Rural	297	5.20	2.01	0.12			
4. Fine Arts	Urban	304	3.13	1.87	0.11	-3.16	519	p<.01
	Rural	218	3.62	1.54	0.11			
5. History	Urban	263	4.24	2.04	0.13	-0.87	533	ns
	Rural	273	4.39	1.97	0.12			
6. Geography	Urban	495	6.39	1.95	0.09	-5.89	806	p<.001
	Rural	313	7.19	1.77	0.10			
7. Physics	Urban	286	3.92	2.12	0.13	-6.51	351	p<.001
	Rural	46	5.86	2.19	0.27			
8. Biology	Urban	286	3.99	2.00	0.12	-5.75	351	p<.001
	Rural	46	5.52	1.63	0.20			
9. Chemistry	Urban	286	3.82	2.23	0.14	-7.47	351	p<.001
	Rural	46	6.16	2.35	0.29			
10. Additional Mathematics	Urban	286	4.68	2.43	0.15	-6.55	351	p<.001
	Rural	46	6.98	2.45	0.32			

(Continued)

11. Modern Mathematics	Urban	532	5.21	3.20	0.14	-12.31	879	p<.001
	Rural	350	7.64	2.26	0.12			
12. Human Biology	Urban	106	3.89	1.94	0.19	-3.96	241	p<.001
	Rural	137	4.85	1.85	0.16			
13. Elementary Islamic Knowledge	Urban	160	3.79	1.84	0.15	3.23	358	p<.01
	Rural	200	3.18	1.75	0.12			
14. Advanced Islamic Knowledge	Urban	33	3.75	1.97	0.35	0.13	118	ns
	Rural	88	3.70	1.62	0.17			
15. Arabic Language	Urban	31	8.29	1.70	0.31	-1.52	118	ns
	Rural	86	8.69	1.03	0.11			
16. Chinese Language	Urban	99	4.25	2.02	0.20	-4.06	127	p<.001
	Rural	30	6.00	2.20	0.40			
17. Commerce	Urban	208	5.51	2.33	0.16	-1.25	288	ns
	Rural	82	5.87	1.74	0.19			
18. General Science	Urban	73	5.22	2.32	0.16	-1.34	166	ns
	Rural	95	5.65	1.87	0.19			
19. Principles of Accountancy	Urban	4	4.00	2.16	1.08	-2.27	12	p<.05
	Rural	10	6.40	1.65	0.52			

N- NUMBER OF CASES; SD- STANDARD DEVIATION; SE- STANDARD ERROR; df- DEGREE OF FREEDOM; ns- NOT SIGNIFICANT (p<.05, p<.01, p<.001).

TABLE 4.2E

The difference in achievement in each subject area between high achievers and low achievers

PREDICTOR VARIABLE	CRITERION VARIABLE	N	MEAN	SD	SE	*t* VALUE	df	SIGNIFICANCE
1. Bahasa Malaysia (Malay Language)	High	489	3.82	1.55	0.07	-3.50	923	p<.001
	Low	436	4.16	1.38	0.07			
2. English Language	High	489	4.05	2.36	0.11	-16.36	923	p<.001
	Low	436	6.50	2.17	0.10			
3. Malay Literature	High	165	4.24	1.94	0.15	-8.97	467	p<.001
	Low	305	5.88	1.88	0.11			
4. Fine Arts	High	273	2.51	1.45	0.09	-12.68	519	p<.001
	Low	249	4.22	1.63	0.10			
5. History	High	226	3.35	1.75	0.12	-10.42	533	p<.001
	Low	310	5.02	1.89	0.11			
6. Geography	High	432	5.79	1.90	0.09	-16.64	806	p<.001
	Low	376	7.74	1.34	0.07			
7. Physics	High	247	3.43	1.73	0.11	-18.15	351	p<.001
	Low	85	7.25	1.08	0.13			
8. Biology	High	247	3.60	1.70	0.10	-13.85	351	p<.001
	Low	85	6.40	1.38	0.15			
9. Chemistry	High	247	3.27	1.71	0.11	-20.20	351	p<.001
	Low	85	7.52	1.29	0.15			
10. Additional Mathematics	High	247	4.26	2.18	0.14	-14.61	351	p<.001
	Low	85	8.28	1.14	0.14			

(Continued)

11. Modern Mathematics	High	474	4.56	3.13	0.14	-19.92	880	p<.001
	Low	408	8.03	1.72	0.09			
12. Human Biology	High	100	3.32	1.64	0.17	-8.48	240	p<.001
	Low	143	5.22	1.75	0.15			
13. Elementary Islamic Knowledge	High	103	2.46	1.43	0.14	-6.99	358	p<.001
	Low	257	3.84	1.80	0.11			
14. Advanced Islamic Knowledge	High	44	2.75	1.63	0.25	-5.16	119	p<.001
	Low	77	4.26	1.50	0.17			
15. Arabic Language	High	43	8.42	1.49	0.23	-1.08	115	ns
	Low	74	8.68	1.09	0.13			
16. Chinese Language	High	114	4.54	2.14	0.20	-1.35	126	ns
	Low	14	5.36	2.27	0.61			
17. Commerce	High	139	4.40	2.00	0.17	-10.67	288	p<.001
	Low	151	6.72	1.69	0.14			
18. General Science	High	62	4.06	1.89	0.24	-7.76	166	p<.001
	Low	106	6.28	1.73	0.17			
19. Principles of Accountancy	High	8	6.50	2.39	0.85	1.90	12	ns
	Low	6	4.33	1.63	0.67			

N- NUMBER OF CASES; SD- STANDARD DEVIATION; SE- STANDARD ERROR; df- DEGREE OF FREEDOM; ns- NOT SIGNIFICANT (p<.05, p<.01, p<.001).

- Elementary Islamic Knowledge (means= 3.16 for boarders, 3.76 for day scholars; t= 3.18; $p<.01$).

d. Next, Table 4.2D shows the mean differences in achievement in each subject area between urban and rural students. Again bear in mind that a low mean score for achievement in this table also implies that the urban or rural student performs at a high achievement level. The results show that the urban students have significantly higher mean scores than the rural students in eleven out of thirteen subject subject areas as follows:

- English Language (means= 4.07 for urban students, 6.86 for rural students; t= 19.13; $p<.001$).
- Fine Arts (means= 3.13 for urban students, 3.62 for rural students; t= 3.16; $p<.01$).
- Geography (means= 6.39 for urban students, 7.19 for rural students; t= 5.89; $p<.001$).
- Modern Mathematics (means= 5.21 for urban students, 7.64 for rural students; t= 12.31; $p<.001$).
- Human Biology (means= 3.89 for urban students, 4.85 for rural students; t= 3.96; $p<.001$).
- Chinese Language (means= 4.25 for urban students, 6.00 for rural students; t= 4.06; $p<.001$).
- Principles of Accountancy (means= 4.00 for urban students, 6.40 for rural students; t= 2.27; $p<.05$).

In regard to the four major science subjects like Physics, Biology, Chemistry and Additional Mathematics, the urban students again have significantly higher mean score than the rural students. The significant mean differences between the two groups in these subject areas are as follows:

- Physics (means= 3.92, 5.86; t= 6.51; $p<.001$).
- Biology (means= 3.99, 5.52; t= 5.75; $p<.001$).
- Chemistry (means= 3.82, 6.16; t= 7.47; $p<.001$)
- Additional Mathematics (means= 4.68, 6.98; t= 6.55; $p<.001$).

In contradiction to the above, rural students have significantly higher mean scores than urban students in Bahasa Malaysia (Malay Language) (means= 3.75 for the rural students, 4.14 for urban students; t= 3.94; $p<.001$); and in the religious subject- Elementary Islamic Knowledge (means= 3.18 for rural students, 3.79 for urban; t= 3.23; $p<.01$).

e. Table 4.2E reveals the mean differences in achievement in each subject area between high achievers and low achievers. As identified earlier, high achievers are those who obtained Grade I, and low achievers are those who obtained Grades II & III in the SPM external examination. As predicted, the high achievers scored better than low achievers in each

subject area, and this is indicated by the mean scores shown in Table 4.2E. High achievers in the entire examination have significantly higher mean scores than low achievers in each of the following subject areas:

- Malay Language (means= 3.82 for high achievers, 4.16 for low achievers; t= 3.50; $p<.001$).
- English Language (means= 4.05 for high achievers, 6.50 for low achievers; t= 16.36; $p<.001$).
- Malay Literature (means= 4.24 for high achievers, 5.88 for low achievers; t= 8.97; $p<.001$).
- Fine Arts (means= 2.51 for high achievers, 4.22 for low achievers; t= 12.68; $p<.001$).
- History (means= 3.35 for high achievers, 5.02 for low achievers; t= 10.42; $p<.001$).
- Geography (means= 5.79 for high achievers, 7.74 for low achievers; t= 16.64; $p<.001$).
- Physics (means= 3.43 for high achievers, 7.25 for low achievers; t= 18.15; $p<.001$).
- Biology (means= 3.60 for high achievers, 6.40 for low achievers; t= 13.85; $p<.001$).
- Chemistry (means= 3.27 for high achievers, 7.52 for low achievers; t= 20.20; $p<.001$).
- Additional Mathematics (means= 4.26 for high achievers, 8.28 for low achievers; t= 14.61; $p<.001$).

- Modern Mathematics (means= 4.56 for high achievers, 8.03 for low achievers; t= 19.92; $p<.001$).
- Human Biology (means= 3.32 for high achievers, 5.22 for low achievers; t= 8.48; $p<.001$).
- Elementary Islamic Knowledge (means= 2.46 for high achievers, 3.84 for low achievers; t= 6.99; $p<.001$).
- Advanced Islamic Knowledge (means= 2.75 for high achievers, 4.26 for low achievers; t= 5.16; $p<.001$).
- Commerce (means= 4.40 for high achievers, 6.72 for low achievers; t= 10.67; $p<.001$).
- General Science (means= 4.06 for high achievers, 6.28 for low achievers; t= 7.76; $p<.001$).

The results in Table 4.2E also tell us that there are no significant differences between mean scores of high and low achievers in the three subject areas: Arabic Language, Chinese Language and Principles of Accountancy.

4.4. The Relationships Between Achievement and Student Variables Within Academic Streams and Within Subject Areas.

This section examines the hypotheses or research questions 1, 2 and 3 as stated in the former section of this chapter. In this section, the researcher proposes to use the Pearson's correlation coefficient because, according to Taylor and Hawkins (1983), this correlational analysis attempts to find the 'strength' of the association between two variables. The basic concern of correlational analysis is the relationship between two sets of measures. It asks whether given one set of measures X it is possible to estimate (predict) a second set of measures Y (Wherry, 1984). In a simpler way, it asks to what extent two variables are related to each other.

The Pearson's product-moment correlation coefficient analysis, which measures the degree of correlation between variables, was used to study possible relationships between: (a) achievement within each subject area and students' variables such as school motivation, learning approaches and learning styles; and (b) students' optimistic view of academic study and their school motivation, learning approaches and learning styles.

Achievement in the SPM external examination is scored

in the direction such that the higher the score the lower the student achieves. Figure 4B explains the scoring of achievement and the implications for the interrelation with another variables. As low mean score indicates a high achievement level, a positive (+) correlation is really a negative (-) relationship between achievement and each student variable.

FIGURE 4B

Direction of Scoring of Achievement and Students' Variables in Interpreting Meaning of Positive and Negative Correlations.

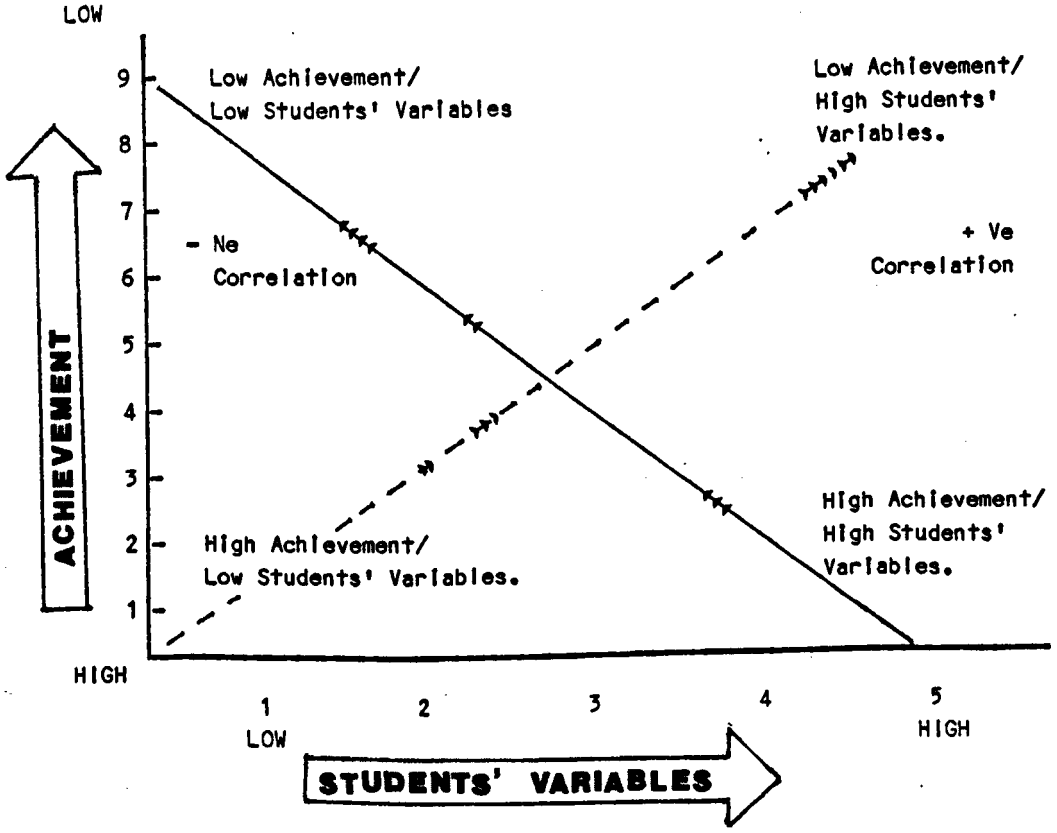


TABLE 4.3
Correlations between school motivation, learning approaches, learning styles and academic achievement of students in different subject areas

PREDICTOR VARIABLES

SUBJECT (CRITERION)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
BM (N=925)	038ns	084*	-022ns	-113**	-038ns	054ns	041ns	-022ns	035ns	-063*	-062*	-057*	073*	-001ns	-019ns	-053ns
EL (N=925)	042ns	020ns	-021ns	027ns	024ns	-043ns	076*	-019ns	117**	046ns	-088*	-021ns	-023ns	-186**	-091*	-095*
ML (N=470)	-028ns	-012ns	005ns	069ns	-029ns	-071ns	100*	-014ns	-026ns	-054ns	-069ns	-007ns	017ns	-019ns	-005ns	-098*
FAr (N=522)	012ns	058ns	-027ns	054ns	-085*	-041ns	028ns	-048ns	074ns	028ns	-037ns	-012ns	-030ns	073ns	-050ns	-003ns
His (N=536)	114*	128**	049ns	090*	028ns	051ns	079*	023ns	098*	071ns	040ns	-013ns	075*	051ns	065ns	-004ns
Geo (N=808)	-007ns	-038ns	-024ns	004ns	-056ns	-110**	040ns	035ns	160**	026ns	-142**	-067*	015ns	066*	-033ns	-036ns
Phy (N=353)	004ns	003ns	141**	-004ns	-010ns	-006ns	067ns	013ns	234**	124*	032ns	018ns	035ns	025ns	008ns	-048ns
Bio (N=353)	-034ns	023ns	066ns	-040ns	-004ns	-082ns	015ns	-004ns	257**	042ns	-063ns	-067ns	-006ns	-060ns	-082ns	-093*
Che (N=353)	051ns	102*	165**	027ns	059ns	030ns	161**	-006ns	186**	171**	049ns	-009ns	115*	148*	088ns	-103*
AM (N=353)	-059ns	-055ns	-068ns	022ns	-083ns	-048ns	-017ns	140*	226**	139*	-013ns	023ns	165**	-036ns	046ns	017ns
MM (N=353)	-051ns	-070*	-025ns	-006ns	-021ns	147**	-005ns	-004ns	135**	084*	-114**	-085*	-039ns	133**	-119**	-073*
HB (N=243)	-038ns	-064ns	-070ns	-007ns	-022ns	-083ns	-045ns	-051ns	-006ns	-079ns	-118*	-064ns	-115*	-016ns	-087ns	-021ns
EIK (N=360)	-017ns	050ns	-058ns	-059ns	-059ns	030ns	-039ns	-012ns	030ns	-017ns	-024ns	053ns	-043ns	-010ns	-050ns	071ns
AIK (N=121)	046ns	-018ns	055ns	021ns	092ns	-013ns	-049ns	-015ns	038ns	-056ns	025ns	031ns	044ns	117ns	039ns	-006ns

(Continued)

PREDICTOR VARIABLES

SUBJECT (CRITERION)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
AL (N=117)	-230*	-131ns	037ns	015ns	-074ns	238*	030ns	099ns	042ns	-019ns	-219*	-088ns	-062ns	-223*	029ns	-162*
CL (N=129)	134ns	-008ns	082ns	057ns	-029ns	-033ns	151*	065ns	149*	-172*	-177*	-124ns	113ns	-013ns	045ns	-216*
Com(N=290)	075ns	118*	-055ns	047ns	-016ns	-053ns	011ns	100ns	160*	165*	-028ns	-003ns	-087ns	120*	034ns	038ns
GS (N=168)	077ns	-108ns	069ns	-068ns	-060ns	-047ns	103ns	-068ns	121ns	-109ns	009ns	050ns	-004ns	-180*	089ns	-035ns
PA (N=15)	-533*	-483*	-502*	-007ns	-582*	-714**	-352ns	-632*	-182ns	-414ns	-706**	-534*	-561*	-467*	-743**	-432ns

Notes: Decimal points omitted

BM- Bahasa Malaysia (Malay Language); EL - English Language; ML - Malay Literature; FAr - Fine Arts; His- History; Geo - Geography; Phy - Physics; Bio - Biology; Che - Chemistry: AM - Additional Mathematics; MM - Modern Mathematics; HB - Human Biology; EIK - Elementary Islamic Knowledge; AIK - Advanced Islamic Knowledge; AL - Arabic Language; CL - Chinese Language; Com - Commerce; GS - General Science; PA - Principles of Accountancy.

1 -WARMTH; 2 -SOCIABILITY; 3 -COMPETENCE; 4 -INTEREST; 5 -RESPONSIBILITY; 6 -COMPLIANCE;

7 -INTRINSIC MOTIVATION; 8 -INSTRUMENTAL MOTIVATION; 9 -FEAR OF FAILURE; 10 -HOPE FOR SUCCESS; 11 -CONSCIENTIOUSNESS; 12 -DEEP APPROACH;

13 -SURFACE APPROACH; 14 -STRATEGIC APPROACH; 15 -HOLIST STYLE; 16 -SERIALIST STYLE.

N - Number of cases.

Significant ** p<.01; * p<.05; ns- not significant.
(APPENDIX 4B shows the Values of Correlation Coefficient Required for Significance at 0.05 and 0.01 Levels for Samples of Various Size (N)).

4.4.1 Correlation between school motivation, learning approaches, learning styles and academic achievement of students in different subject areas.

Table 4.3 reveals the findings of the above investigation. The achievement in Bahasa Malaysia (Malay Language) is significantly correlated with school motivation variables as follows:

- "Interest" has the highest significant correlation ($r = -.113$; $p < .01$) with achievement in Bahasa Malaysia. This negative correlation implies that lack of interest in Bahasa Malaysia is significantly related to low achievement in Bahasa Malaysia, a compulsory subject everyone must obtain a credit pass. In other words, high achievers are most likely to possess more "interest" than low achievers in Bahasa Malaysia.
- "Sociability" has a significant correlation ($r = .084$; $p < .05$) with achievement in Bahasa Malaysia. This suggests that students' low achievement in Bahasa Malaysia has a link with their "good relationships with others and are accepted well at school."
- "Surface approach" to learning (rote learning) is another significant correlation with achievement in this subject area ($r = .073$; $p < .05$), showing that students' low achievement in Bahasa Malaysia is

significantly related to a "surface approach" to learning.

- "Hope for success" is significantly correlated with achievement in Bahasa Malaysia ($r = -.057$; $p < .05$). This negative correlation indicates that students' low achievement in this subject area is significantly associated with lack of "hope for success". In other words, high achievers in Bahasa Malaysia are likely to have more "hope for success" (determine to do better than others) than low achievers.
- Achievement in Bahasa Malaysia has a significant correlation with "deep approach" to learning ($r = -.057$; $p < .05$), meaning that students' high achievement in Bahasa Malaysia is significantly related to a "deep approach" to learning (looking for meaning and vigorous interaction with content).
- "Conscientiousness" has also a significant correlation with achievement in this subject area ($r = -.062$; $p < .05$). This negative correlation implies that high achievers in Bahasa Malaysia are highly "conscientious", which means that they also have determination to carry out what is expected of them as well as possible.

Students' achievement in English Language is significantly correlated with:

- "Fear of failure" ($r = .117$; $p < .05$); suggesting that

low achievers in English Language is significantly related to "fear of failure", that is, they worry about being behind with work or doing worse than others because they are likely to have little confidence in their ability in English Language.

- "Intrinsic motivation" ($r = .076$; $p < .05$). This significant correlation shows that students who achieve low in English Language are likely to possess intrinsic motivation. In contrast, high achievers in English Language seem to be less intrinsically motivated than low achievers in that particular subject area.

Significant negative correlations are found in the relationships between students' achievement in English Language and the following students' variables:

- "Strategic approach" to learning ($r = -.186$; $p < .01$). This negative correlation indicates that high achievers in English Language are also high on adopting a "strategic approach" to learning. This possibly means that the high achiever in this subject area "do try to organize time and distribute effort to obtain highest possible grades".
- "Serialist style" ($r = -.095$; $p < .05$) and "holist style" ($r = -.091$; $p < .05$), respectively. These two negative correlations imply that students' high achievement in English Language is also

significantly related to their possession of either a "serialist style" or a "holist style" to learning, which, Pask (1976a) refers to as a "versatile" student.

- "Conscientiousness" ($r = -.088$; $p < .05$). This negative correlation implies that having a "conscientiousness" motivation (determined to carry out what is expected of one as well as possible) is significantly related to high achievement in English Language.

Achievement in Malay Literature is significantly correlated with:

- "intrinsic motivation" ($r = .100$; $p < .05$). This positive correlation implies that students' high achievement in this subject area is more likely to be due to external pressures and rewards rather than their own deep interest and excitement in it for the sake of learning.
- the variable "serialist style" to learning, or what Entwistle(1988) refers to as "relate evidence to conclusion, and examine the logical inter connections of the argument', has a significant negative correlation with achievement in Malay Literature ($r = -.098$; $p < .05$). It seems that high achievers in Malay Literature are likely to adopt a "serialist style" to learning.

In Fine Arts, there is a significant negative correlation between achievement and "responsibility" ($r = -.085$; $p < .01$), which implies that high achievers in Fine Arts are likely to be more responsible than low achievers.

Students' achievement in History is significantly correlated with:

- "Surface approach" ($r = .075$; $p < .05$), suggesting that their low achievement in the history subject is correlated significantly to "memorizing facts or relying on rote learning".
- "Sociability" ($r = .128$; $p < .01$), meaning that students' low achievement in history is associated significantly with their degree of "sociability". On the other hand, high achievers in this subject area tend to be less sociable (lack of both good relationships with others and acceptance at school).
- "Warmth" ($r = .114$; $p < .05$). This positive correlation indicates that students' low achievement in History has a link with their possession of a high degree of "warmth" (empathy from parents, warm relationships with teachers and peer groups).
- "Fear of failure" ($r = .098$; $p < .05$), indicating that "fear of failure" or "worries about being behind with work or doing worse than others" may lead students to obtain poor achievement levels in History.

- "Interest" ($r = .090$; $p < .05$), meaning that low achievement in History is significantly related to the amount of a student's "interest" in this particular subject.
- "Intrinsic motivation" ($r = .079$; $p < .05$) is also significantly correlated with students' achievement in History. This result indicates that high achievers in History are likely not to be intrinsically motivated in studying this subject area. This means that a lack of intrinsic motivativation is another salient variable associated with high achievement in History.

In the subject area Geography, the following students' variables are correlated significantly with achievement:

- "Fear of failure" ($r = .160$; $p < .01$), indicating that fear of failure (worrying about being behind with work or doing worse than others) is likely to be associated with poor student achievement in this particular subject area.
- "Strategic approach" ($r = .066$; $p < .05$). Thus, this positive correlation means "lack of a strategic approach" is significantly related to students' high achievement in Geography.

There are also significant negative correlations between students' achievement in Geography and the

following students' variables:

-"Conscientiousness" ($r = -.142$; $p < .01$). This negative correlation signifies that high achievers in Geography are likely to be highly "conscientious".

-"Compliance" ($r = -.100$; $p < .01$), meaning that low achievement in Geography is associated significantly with a low degree of "compliance" (the controlling influence of religious beliefs, accepting social norms and moral values which give satisfaction).

-"Deep approach" ($r = -.067$; $p < .05$), indicating that students' low achievement in Geography is associated significantly with an absence of a "deep approach" to learning. Thus, high achievers in Geography are likely to possess a deep approach to learning.

Student achievement in Physics is significantly correlated with the following variables:

-"Fear of failure" ($r = .234$; $p < .01$), implies that their low achievement in Physics is significantly related to "fear of failure".

-"Competence" ($r = .141$; $p < .01$). This positive correlation denotes that low achievement in Physics is significantly associated with "competence" - seeking knowledge and being self-confident.

-Low achievers in Physics, also, are likely to possess high "hope for success" ($r = .124$; $p < .05$).

Achievement in Biology is significantly correlated with "fear of failure" ($r = .257$; $p < .01$) and with "serialist style" of learning ($r = -.093$; $p < .05$). These results, respectively, signify that:

-Low achievement in Biology is significantly associated with "fear of failure".

-Low achievement in Biology is significantly related to the absence of a"serialist style" of learning. Thus, high achievers in this subject area tend to be associated with a "serialist style" of learning.

Except for "serialist style", achievement in Chemistry has all significant positive correlations with:

-"Fear of failure" ($r = .186$; $p < .01$); "hope for success" ($r = .171$; $p < .01$); "compliance" ($r = .165$; $p < .01$); "intrinsic motivation" ($r = .161$; $p < .01$); "strategic approach" ($r = .148$; $p < .05$); "surface approach" ($r = .115$; $p < .05$); and "sociability" ($r = .102$; $p < .05$). These correlations denote that low achievers in Chemistry are significantly associated with "fear of failure", "hope for success", "compliance", "intrinsic motivation", "strategic and surface approaches" to learning, and "sociability", respectively.

Achievement in Chemistry is significantly negatively correlated with "serialist style" of learning ($r = -.103$; $p < .05$), indicating that high achievers in this subject area are likely to possess a "serialist style" of learning. Entwistle and Kozeki (1985) define serialist style learners as 'learning best when knowledge is presented formally with a clear structure; tend to miss important links between ideas or between subject areas'.

Table 4.3 also shows that achievement in Additional Mathematics is significantly correlated with:

-"Fear of failure" ($r = .226$; $p < .01$); "surface approach" ($r = .165$; $p < .01$); "hope for success" ($r = .139$; $p < .05$); and "instrumental motivation" ($r = .140$; $p < .05$).

These positive correlations signify that:

-low achievement in Additional Mathematics is related significantly with "fear of failure", a "surface approach" to learning, "hope for success" and "instrumental motivation", respectively.

On the other hand, these results mean that:

-high achievers in Additional Mathematics are likely to possess low fear of failure, rely less on a surface approach to learning, have less hope for success, and possess less instrumental motivation.

Modern Mathematics achievement has significant positive correlations with the following school motivation

variables:

- "Compliance" ($r = .147$; $p < .01$); "fear of failure" ($r = .135$; $p < .01$); "strategic approach" ($r = .133$; $p < .01$) and "hope for success" ($r = .084$; $p < .05$), indicating that students at a lower achievement level are likely to be compliant, fear failure, adopt a strategic approach to learning and possess hope for success.

In addition, students with low achievement in Modern Mathematics are likely to possess less sociability, be less conscientious, do not adopt a deep approach to learning, rely less on a holist style and a serialist style of learning. These interpretations are based on the significant negative correlations as follow:

- "Sociability" ($r = -.070$; $p < .05$); "conscientiousness" ($r = -.114$; $p < .01$); "deep approach" ($r = -.085$; $p < .05$); "holist style" ($r = -.119$; $p < .01$); "serialist style" ($r = -.073$; $p < .05$), respectively.

Students' achievement in Human Biology has significant negative correlations with:

- "Conscientiousness" ($r = -.118$; $p < .05$) and "surface approach" ($r = -.115$; $p < .05$), denoting that low achievement in this subject area is significantly related to low scores in conscientiousness and such low achievers are likely to adopt a low surface approach to learning.

Table 4.3 reveals that there are no significant correlations between students' variables and students' achievement in the religious subject areas - Elementary Islamic Knowledge and Advanced Islamic Knowledge. But Arabic Language correlates significantly negatively with:

- "Warmth" ($r = -.230$; $p < .05$); "strategic approach" ($r = -.223$; $p < .05$); "conscientiousness" ($r = -.219$; $p < .05$); "serialist style" ($r = -.162$; $p < .05$). These correlations indicate that low achieving students in this subject area tend to possess less warmth, a non-strategic approach to learning, less conscientiousness and lack of a serialist style to learning, respectively.

In contrast, Arabic-Language achievement has a significant positive correlation with "compliance" ($r = .238$; $p < .01$), implying that low achievers in Arabic Language are significantly associated with a high degree of compliance.

Chinese Language achievement has significant positive correlations with:

- "Intrinsic motivation" ($r = .151$; $p < .05$) and "fear of failure" ($r = .149$; $p < .05$), denoting that low achievers in Chinese Language possess intrinsic motivation and fear of failure.

In contrast, Chinese Language achievement is significantly negatively correlated with the following school motivation and learning style:

- "Conscientiousness" ($r = -.177$; $p < .05$); "hope for success" ($r = -.172$; $p < .05$); and "serialist style" ($r = -.216$; $p < .05$). The results suggest that the lower students achieved, they are likely to possess less conscientiousness, to have less hope for success and to rely less on a serialist style of learning.

Commerce achievement correlates significantly with:

- "Hope for success" ($r = .165$; $p < .05$). This positive correlation signifies that low achievement in Commerce is significantly related to high "hope for success".
- "Fear of failure" ($r = .160$; $p < .05$), meaning that low achievers in Commerce are likely to possess high fear of failure. Thus, the higher they achieve, they are likely to be less fearful of failure.
- "Strategic approach" ($r = .120$; $p < .05$), denoting that low achievers are likely to possess a strategic approach to learning.
- "Sociability" ($r = .118$; $p < .05$), indicating that low achievers in this particular subject area are likely to be sociable, that is, they possess good

relationships with others and are accepted well at school.

Achievement in General Science correlates significantly with a "strategic approach "to learning ($r = .180$; $p < .05$). This positive correlation signifies that low achievers are likely to adopt a strategic approach to learning. In other words, the higher they achieve the more likely they may possess a non-strategic approach to learning.

Table 4.3 also reveals that achievement in the Principles of Accountancy is significantly correlated with the following variables:

- "Warmth" ($r = -.533$; $p < .05$); "sociability" ($r = -.483$; $p < .05$); "competence" ($r = -.502$; $p < .05$); "responsibility"($r = -.582$; $p < .05$); "compliance" ($r = -.714$; $p < .01$); "instrumental motivation" ($r = -.632$; $p < .05$); "conscientiousness" ($r = -.706$; $p < .01$); "deep approach" ($r = -.534$; $p < .05$); "surface approach" ($r = -.561$; $p < .05$); "holist style" ($r = -.743$; $p < .01$); and "strategic approach" ($r = -.467$; $p < .05$).

These negative correlations imply that low achievers in this subject area possess less than high achievers in:

(a) warmth and empathy from parents and warm relationships with teachers and peer groups;

(b) sociability, that is, good relationships with others and acceptance at school.

(c) accepting responsibility for own success or failure;

(d) compliance with responsible demands;

(e) instrumental motivation, that is, interested in the qualification only;

(f) determination to carry out what is expected as well as possible;

(g) likelihood of adopting a "deep approach", "surface approach" and "holist style" to learning, respectively. "Deep approach" and "surface approach" are contradictions, meaning that it is possible that some of the high achievers may rely on a "deep approach" and some others on a "surface approach".

The highest correlation is with "holist style", meaning that high achievers can learn best by making use of analogies and illustrations; they tend to generalise too readily and reach conclusions on inadequate evidence.

4.4.2 Correlations of students' optimistic view of academic study to their achievement, school motivation, learning approach and learning style.

The correlational analyses to test the second hypothesis is presented in Table 4.4. Optimism, school motivation, learning approaches and learning styles in Table 4.4 are scored in a positive direction such that low scores represent low values of the characteristics and high scores represent high values of the same characteristics.

Some features of Table 4.4 merit comment. Students' optimism are significantly positively correlated with (a) "intrinsic motivation" ($r = .129$; $p < .01$); (b) "hope for success" ($r = .112$; $p < .01$); (c)"conscientiousness" ($r = .121$; $p < .01$);(d) "holist style" ($r = .119$; $p < .01$); and (e) "deep approach" ($r = .098$; $p < .05$). These correlations are presented precisely by diagram in Figure 4C. The significant positive correlations indicate that:

(a) Optimistic students are likely to possess a high degree of intrinsic motivation, that is, interested in learning for its own sake and not because of external pressures.

(b) Optimistic students are associated with hope for success. Thus, in hoping for success they tend to be competitive, determined to do better than

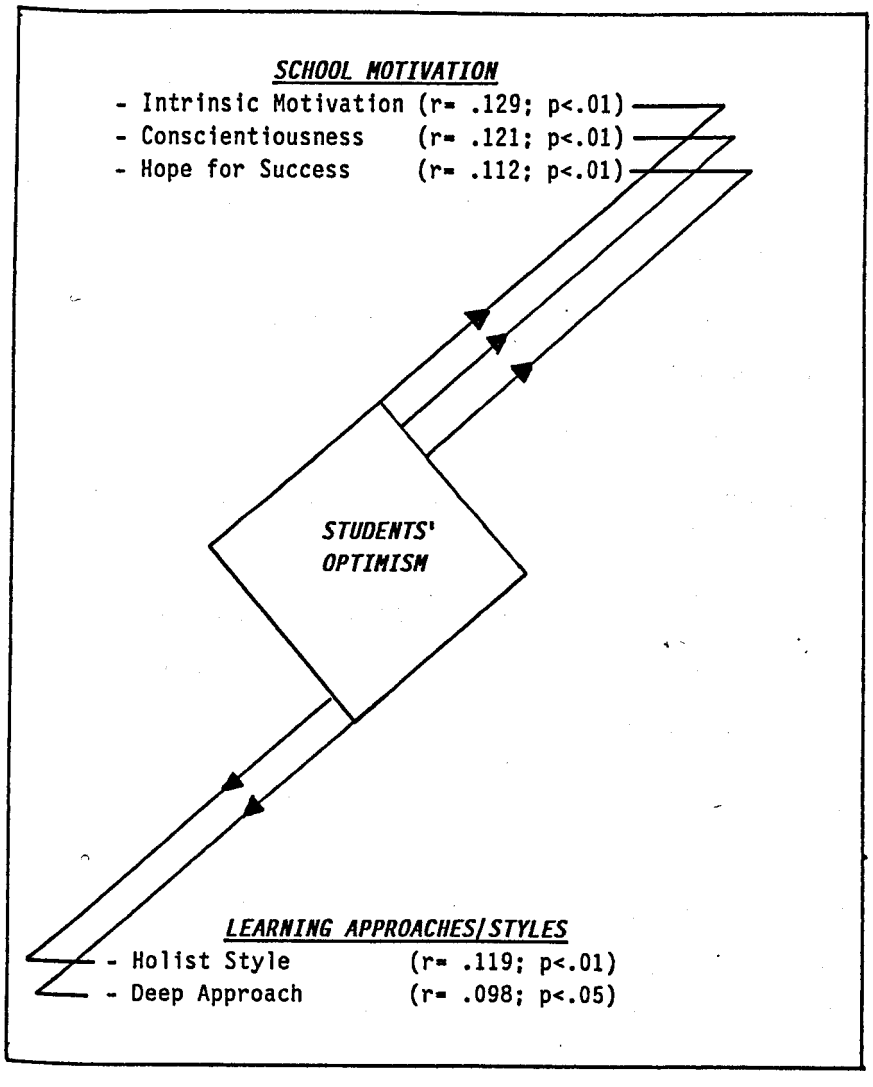
TABLE 4.4

Table of correlation between optimistic scale and the variables of achievement ,school motivation, learning approaches and learning styles

Variables	Optimistic Scale r	Significance
ACHIEVEMENT IN THE SPM	090	ns
WARMTH	043	ns
SOCIABILITY	079	ns
COMPETENCE	079	ns
INTEREST	084	ns
RESPONSIBILITY	063	ns
COMPLIANCE	063	ns
INTRINSIC MOTIVATION	129	p<.01
INSTRUMENTAL MOTIVATION	061	ns
FEAR OF FAILURE	041	ns
HOPE FOR SUCCESS	112	p<.01
CONSCIENTIOUSNESS	121	p<.01
DEEP APPROACH	098	p<.05
SURFACE APPROACH	071	ns
STRATEGIC APPROACH	041	ns
HOLIST STYLE	119	p<.01
SERIALIST STYLE	073	ns

Notes: Decimal points omitted
ns- Not Signicant at p<.05 and p<.01 levels.

FIGURE 4C
Diagrams Showing Relationships Between Students' Optimism, School Motivation, Learning Approaches and Styles



others so as to maintain a high level of self-esteem.

(c) Optimistic students tend to have high "conscientious" motivation, that is, they are very determined to carry out what is expected as well as possible.

(d) Optimistic students are considerably dependent on a holistic style of learning. In other words, their style of learning is likely to concentrate initially on a broad view of a topic, to learn best by making use of analogies and illustrations and to prefer anecdotal personalized teaching.

(e) Optimistic students, to some extent, are associated with a deep approach to learning. With a "deep approach" the intention is to understand the meaning of an article, relating it to previous knowledge, other topics, and personal experience.

4.4.3 The differences in achievement between internal and external locus of control in each subject area.

In this investigation, the question arising is whether or not there are differences in the means of achievement in each subject area in the Sijil Pelajaran Malaysia external examination between the group possessing 'internal locus of control' and the group possessing

'external locus of control'? The criterion was classified into a dichotomous (binary) form - "internal" and "external". "Locus of control" is scored in the "external" direction, that is, the higher the score the more external is the individual. Table 4.5A presents the summary statistics of responses to the locus of control scale and Table 4.5B reveals the mean differences in achievement between "internal" and "external" locus of control in each subject area.

TABLE 4.5A
Summary Statistics of Responses to the Rotter's I-E Locus of Control Inventory

N	Mean	Standard Deviation	Standard Error	Median	Range Score Min.	Max.
925	6.81	2.56	0.08	7.00	1	14

"Internal" and "external" loci of control are differenciated by the median value; thus, students classified as "internal" locus of control are those who scored between 1 to 7 and those classified as "external" locus of control score between 8 to 14.

TABLE 4.5B

Internal and External Locus of Control :

Differences in achievement in each subject area.

SUBJECT	GROUP	N	MEAN	SD	SE	*t* VALUE	df	SIGNIFICANCE
Bahasa Malaysia (Malay Language)	Internal	549	4.00	1.50	0.06	0.47	923	ns
	External	376	3.95	1.48	0.08			
English Language	Internal	549	5.23	2.61	0.11	0.30	923	ns
	External	376	5.18	2.53	0.13			
Malay Literature	Internal	267	5.51	2.03	0.12	1.37	468	ns
	External	203	5.05	2.07	0.15			
Fine Arts	Internal	309	3.30	1.75	0.10	-0.42	520	ns
	External	213	3.37	1.77	0.12			
History	Internal	317	4.41	2.09	0.12	1.26	534	ns
	External	219	4.19	1.88	0.13			
Geography	Internal	483	6.68	1.96	0.09	-0.47	806	ns
	External	325	6.74	1.88	0.10			
Physics	Internal	222	4.33	2.23	0.16	0.30	351	ns
	External	131	4.25	2.34	0.21			
Biology	Internal	222	4.27	2.04	0.14	-0.14	351	ns
	External	131	4.30	2.00	0.18			
Chemistry	Internal	222	4.31	2.46	0.17	0.49	351	ns
	External	131	4.18	2.38	0.22			
Addional Mathematics	Internal	222	5.20	2.60	0.18	0.79	351	ns
	External	131	4.96	2.57	0.24			

(Continued)

SUBJECT	GROUP	N	MEAN	SD	SE	t VALUE	df	SIGNIFICANCE
Modern Mathematics	Internal	517	6.00	3.16	0.14	-1.72	880	ns
	External	365	6.41	3.02	0.16			
Human Biology	Internal	150	4.43	1.97	0.16	0.01	241	ns
	External	93	4.43	1.92	0.20			
Elementary Islamic Knowledge	Internal	203	3.50	1.80	0.13	0.60	358	ns
	External	157	3.38	1.84	0.15			
Advanced Islamic Knowledge	Internal	55	3.67	1.66	0.22	-0.22	119	ns
	External	66	3.74	1.76	0.22			
Arabic Language	Internal	54	8.48	1.41	0.19	-0.80	115	ns
	External	63	8.67	1.09	0.14			
Chinese Language	Internal	85	4.78	2.21	0.24	0.85	127	ns
	External	44	4.43	2.15	0.32			
Commerce	Internal	164	5.55	2.21	0.17	-0.55	288	ns
	External	126	5.69	2.15	0.19			
General Science	Internal	92	5.46	2.16	0.23	-0.05	166	ns
	External	76	5.47	2.00	0.23			
Principles of Accountancy	Internal	9	4.33	2.24	0.75	-2.58	13	p<.05
	External	6	7.00	1.41	0.58			

Note: The Mean scores are based on the SPM examination results (achievement scores for each subject The scores ranged from 1 unit (being the best or distinction score) to 9 units (failed). Thus, a low mean score for achievement in each subject area implies that the group performs a high achievement level.

Key : N= NUMBER OF CASES; SD= STANDARD DEVIATION; SE= STANDARD ERROR;
df= DEGREE OF FREEDOM; ns= NOT SIGNIFICANT AT p<.05; p<.01 and p<.001 (see APPENDIX 4A).

The results in Table 4.5B indicate that there are no significant mean differences in achievement between "internal" and "external" loci-of-control groups of students in all subject areas, except in Principles of Accountancy (means = 4.33 for internal, 7.00 for external; $t = -2.58$; $p < .05$). This is an exceptional case because of its small sample (N= 15); its reliability is questionable. As a whole, the outcomes in Table 4.5B indicate that the claim that one ought to possess an "internal" locus of control in order to obtain a high achievement level (see literature review in Chapter II) is not supported.

4.5 The contributions of students' variables to achievement

This section deals with research questions or hypotheses 4 to 7 (see Chapter I). The statistical technique used in these 'predictive' analyses was multiple regression. Grobe (1973) pointed out that multiple regression analysis is a conceptually simple and powerful approach to the study of a wide variety of research problems, especially in dealing with the estimation or prediction of one variable (dependent) from the knowledge of other variables (independent). Guilford (1965), and Draper and Smith (1966) proclaimed that no method is so well-suited to estimation or prediction analyses as

multiple regression, particularly the stepwise regression procedure.

Multiple regression analysis seeks to predict one or more 'criterion' variables (here the various dimensions of students' achievement) on the basis of a number of selected independent predictor variables such as students' demographic variables, school motivation, learning approaches, learning styles, locus of control and optimism-pessimism. Students' achievement, locus of control and optimism were criterion variables in some of the analyses and predictor variables in others.

Wilkinson (1975) referred to the dependent variables as the 'criterion' variables and the independent variables as 'antecedent'. He noted that it was necessary to have some understanding of what variables could be regarded as 'criterion' and which could be considered as 'antecedent' or predictor variables. Bearing this in mind, the researcher took precautionary steps in deciding which criteria and antecedents to use in each step of the investigation.

The stepwise regression procedure is a method that combines the technique of forward and backward eliminations of predictor variables. The stepwise procedure in the SPSS program, employed in the analyses, is mostly a variation on

the forward elimination. This stepwise procedure provides considerable control over the inclusion of the independent variables into the regression equations by specifying the level of F ratio for entering and a level of F for removing a variable. These are based on the principles given by Snedecor (1937) for .05 points and .01 points of significance for the distribution of F values which are incorporated in the program. In the technique of backward elimination, variables not making a significant contribution to the predicted value of the criterion score variance are then successively removed from the equation. At each step the least significant variable is removed until all remaining variables reach the pre-chosen significant level with the adjusted equation. The significance of the final regression equation is estimated from the R^2 value - the fraction of the criterion variable score variance that is matched by the value calculated from the regression equation. This facilitates the selection of independent variables that provide the best possible prediction.

In the forward elimination, at each step the variable that makes the greatest increment to R^2 (or the variance of the dependent variable explained by the independent variables which are entered in the regression equation) is entered, provided the F ratio associated with it - labelled

'F to enter'- exceeds the prespecified F for entering a variable. The variable that has the lowest partial correlation with the criterion enters first in the equation and the one with the highest partial correlation with the criterion enters last in the equation.

Thus, F ratio and R^2 are calculated for a variable when it is entered last. These F ratios were labelled 'F to remove' since they indicated the significance level associated with the removal of the variable. The analyses are terminated when no variable not in the equation has an 'F to enter' that exceeds the prespecified F for entering and no variable in the equation that has an 'F to remove' smaller than the prespecified 'F for removal'.

Draper and Smith (1966) noted that a variable which may have been the best single variable to enter at an early stage may, at a later stage, be superfluous because of the relationships between it and other variables in the regression. This could be checked by the partial F criterion for each variable in the regression at any stage of calculation where it is evaluated and compared with a preselected percentage point of the appropriate F distribution. Any variable which provides a nonsignificant contribution is removed and the process is continued until no more variables are admitted to the equation and no more are rejected.

With the present SPSS^{X} program, the advantages of the new stepwise procedure are more simple and straight forward.According to Gunst and Mason (1980), at any given step the method allows one to judge the contribution of each predictor in the subset as though it were the most recent variable to enter the prediction equation. They noted that the actual order of entry of the predictor is ignored and any variable that does not make a significant contribution, at the given step, is eliminated.

At each step of the analyses, various calculations are performed and printed. Among these were: Mult R (R value of multiple correlation), R^2 (R square), adjusted R^2, F equation,significant F, R square change, F change and the beta weights. All these results are not reported in the following tables, but only those most pertinent for the presentation and interpretation of the stepwise regression analyses used in Tables 4.6, 4.7, 4.8 and 4.9. In this study, the kind of interpretation is in terms of R^2, which Guilford (1965) called 'the co-efficient of multiple determination'. This tells us the proportion of the variance in X_1 that is dependent upon, associated with, or predicted by X_2 and X_3 combined with the regression weights used (Guilford, 1965). In this case, say for example, R^2 is .5530, we can say that 55.30 percent of the variance of a

predictor variable contributes to the criterion (in this case the students' achievement). The remaining percentage of the variance, which is 44.70 (1- R^2), is still to be accounted for and may be predicted by other predictor variables in the equation.

4.5.1 The contribution of students' variables to achievement in the Sijil Pelajaran Malaysia external examination.

In this stepwise regression analysis the criterion variable was the students' achievement based on the aggregate (see Chapter III) in the examination results.The predictor variables put into the stepwise regression analysis were the students' demographic variables (academic stream, gender, residential status- boarders/day scholars, residency - urban/rural, parents' qualification and size of family), learning approaches, learning styles, school motivation, locus of control and optimism.

Table 4.6A shows the results of the stepwise regression which examines the contribution of students' variables to achievement in the SPM external examination. In this table the best predictor is "academic stream", where more than 20 percent (%) of variance in achievement is explained by which stream a student is in. This

TABLE 4.6A

Stepwise Regression: The contribution of students' variables to achievement in the Sijil Pelajaran Malaysia (SPM) examination

Predictor Variable	*Criterion: Students' achievement in SPM* Mult R	R^2	ΔR^2	F(Eqn)	$F \Delta R^2$	Significance F
Academic Stream	.450	.202	.202	233.263	233.263	p<.001
Father's Qualification	.497	.247	.045	150.764	54.659	p<.001
Hope for Success	.532	.283	.036	120.539	45.492	p<.001
Fear of Failure	.546	.299	.016	97.558	20.810	p<.001
Sociability	.560	.313	.015	83.577	19.698	p<.001
Compliance	.571	.326	.013	73.775	17.318	p<.001
Residency (Urban/Rural)	.580	.336	.010	66.043	13.570	p<.001
Warmth	.586	.344	.008	59.715	10.579	p<.001
Mother's Qualification	.592	.350	.007	54.555	9.054	p<.001
Family Size	.596	.355	.005	50.052	6.545	p<.001
Serialist Style	.599	.359	.004	46.270	5.808	p<.001
Competence	.602	.362	.004	43.014	4.973	p<.001
Strategic Approach	.604	.365	.003	40.142	3.988	p<.001

Based on responses of 925 students

Mult R - Multiple R; R^2 - R Square; ΔR^2 - R Square Change; $F \Delta R^2$ - F Change.

indicates that academic stream, be it arts or science stream, has significant correlation with achievement. The 't' test analysis in Table 4.6B reveals the mean differences in achievement between the arts and science steam students. As stated earlier, a low mean score for achievement implies that the group performs at a high achievement level. The science stream has a significantly higher mean score for achievement in the whole examination, compared to arts stream (means= 19.26 and 26.42, respectively; t= 2.33; $p<.05$). Thus, it is not surprising that achievement in the **SPM** is considerably dependent on the students' stream (arts or science).

TABLE 4.6B
The mean differences in achievement between arts and science stream

GROUP	N	MEAN	SD	SE	t	SIGNIFICANCE
Arts	593	26.42	6.51	0.27	2.33	$p<.05$
Science	332	19.26	7.29	0.40		

Table 4.6A, also, shows that about 5% of variance in achievement is accounted for by "father's qualification", which implies that a significant percentage of the variation in students' achievement is determined by whether or not their fathers are educated or literate.

"Hope for success" - About 4% of variance in achievement is explained by the level of students' hope for success, meaning that variation in achievement is considerably dependent on the variability of hope for success scores.

"Fear of failure" - About 2% of the variance in achievement is explained by variations in students' scores on such items as "tends to panic in exams", "worries about teacher's criticisms", "lack of self-confidence", and "worries about being behind with work" or "doing worse than others".

"Sociability", "compliance" and "residency", each contribute 1% or more to achievement variance. This signifies that achievement, to some extent, is dependent on the variability of each of the sub-scales as "having good relationships with others and acceptance at school", "need for order and compliance with norms" and "on the residential area (urban or rural) from which the students come".

Each of the predictor variables "warmth", "mother's qualification", "family size","serialist style" of learning, "competence", and "strategic approach" to learning only account for less than 1% of the achievement variance.

Altogether the predictor variables explained 36.5% of achievement variance. Seven out of thirteen predictor variables provide a significant explanation (more than 1% of achievement variance) for achievement as measured by the SPM external examination.

4.5.2 Identifying the most important predictor variables contributing to students' achievement in each subject area.

These analyses are given in Table 4.7. The criterion variables were all the 19 subject areas taken in the SPM examination (how the scores were obtained was discussed in Chapter IV). The predictor variables included students' demographic variables, school motivation, learning approaches, learning styles, locus of control and optimism. From Table 4.7 the following informations could be gathered:

Bahasa Malaysia - the best predictor is "Day Scholar/Boarder". About 7% of achievement variance in the Bahasa Malaysia is explained by whether he/she is a day scholar or a boarder.
Table 4.2C, as discussed earlier, shows that boarders have a significantly higher mean score than day scholars, indicating that the boarders' achievement is superior to that of day scholars in this subject area.

TABLE 4.7

Stepwise Regression: Identifying the most important predictor variables contributing to students' achievement within each subject area

Subject (Criterion)	Predictor Variable	Mult R	R^2	ΔR^2	$F\Delta R^2$	Significance F
Bahasa Malaysia (N=925)	DAY SCHOLAR/BOARDER	.269	.072	.072	37.829	p<.001
	FATHER'S QUALIFICATION	.303	.092	.019	10.187	p<.001
	INTEREST	.320	.103	.011	6.004	p<.001
	CONSCIENTIOUSNESS	.333	.111	.009	4.636	p<.001
	COMPLIANCE	.347	.121	.009	5.108	p<.001
English Language (N=925)	DAY SCHOLAR/BOARDER	.537	.288	.288	370.966	p<.001
	FATHER'S QUALIFICATION	.644	.415	.127	197.859	p<.001
	ACADEMIC STREAM	.706	.498	.084	153.127	p<.001
	RESIDENCY (Urban/Rural)	.718	.515	.017	31.718	p<.001
	GENDER	.727	.529	.014	26.554	p<.001
	MOTHER'S QUALIFICATION	.734	.539	.010	19.379	p<.001
	STRATEGIC APPROACH	.741	.549	.010	20.737	p<.001
	FAMILY SIZE	.746	.556	.007	15.056	p<.001
	HOLIST STYLE	.749	.562	.005	10.674	p<.001
	INTEREST	.752	.565	.003	6.965	p<.001
	SERIALIST STYLE	.754	.569	.004	8.327	p<.001
	FEAR OF FAILURE	.756	.572	.003	7.226	p<.001
	CONSCIENTIOUSNESS	.758	.574	.002	4.287	p<.001
Malay Literature (N=470)	CONSCIENTIOUSNESS	.352	.124	.124	40.557	p<.001
	HOPE FOR SUCCESS	.377	.142	.018	6.069	p<.001
Fine Arts (N=522)	ACADEMIC STREAM	.348	.121	.121	71.024	p<.001
	SOCIABILITY	.371	.137	.016	9.746	p<.001
History (N=536)	OPTIMISM	.389	.151	.151	39.470	p<.001
	DEEP APPROACH	.412	.169	.018	4.889	p<.001
	HOPE FOR SUCCESS	.429	.184	.015	4.013	p<.001
Geography (N=808)	ACADEMIC STREAM	.513	.263	.263	286.474	p<.001
	INSTRUMENTAL MOTIVATION	.577	.333	.070	84.336	p<.001
	FEAR OF FAILURE	.585	.343	.009	11.423	p<.001
	CONSCIENTIOUSNESS	.593	.352	.009	11.290	p<.001
	INTRINSIC MOTIVATION	.596	.355	.004	4.393	p<.001

(Continued)

Subject (criterion)	Predictor Variable	Mult R	R^2	ΔR^2	$F \Delta R^2$	Significance F
Physics (N=332)	FEAR OF FAILURE	.763	.582	.582	18.940	p<.001
	COMPETENCE	.771	.594	.012	5.454	p<.001
Biology (N=332)	RESIDENCY (Urban/Rural)	.294	.086	.086	33.097	p<.001
	MOTHER'S QUALIFICATION	.355	.126	.040	15.976	p<.001
	FEAR OF FAILURE	.377	.142	.016	6.609	p<.001
	SERIALIST STYLE	.394	.156	.013	5.462	p<.001
	COMPETENCE	.414	.172	.016	6.701	p<.001
Additional Mathematics (N=332)	RESIDENCY (Urban/Rural)	.365	.133	.133	48.223	p<.001
	FAMILY SIZE	.473	.224	.091	36.568	p<.001
	FEAR OF FAILURE	.513	.263	.040	16.741	p<.001
	SURFACE APPROACH	.533	.284	.021	8.906	p<.001
Chemistry (N=332)	RESIDENCY (urban/RURAL)	.343	.118	.118	44.328	p<.001
	SERIALIST STYLE	.390	.152	.035	13.529	p<.001
	FEAR OF FAILURE	.431	.185	.033	13.327	p<.001
	STRATEGIC APPROACH	.463	.215	.029	12.239	p<.001
	MOTHER'S QUALIFICATION	.484	.234	.020	8.425	p<.001
	COMPETENCE	.494	.244	.010	4.219	p<.001
Modern Mathematics (N=882)	ACADEMIC STREAM	.829	.687	.687	1033.231	p<.001
	DAY SCHOLAR/BOARDER	.836	.700	.013	19.667	p<.001
	MOTHER'S QUALIFICATION	.841	.707	.007	11.462	p<.001
	FEAR OF FAILURE	.842	.709	.003	4.468	p<.001
	WARMTH	.844	.713	.003	5.135	p<.001
	COMPLIANCE	.846	.715	.003	4.690	p<.001
Human Biology (N=243)	DAY SCHOLAR/BOARDER	.273	.075	.075	19.417	p<.001
	FAMILY SIZE	.302	.091	.017	4.460	p<.001
Elementary Islamic Knowledge (N=360)	RESIDENCY (Urban/Rural)	.350	.123	.123	13.987	p<.001
	MOTHER'S QUALIFICATION	.417	.174	.051	6.138	p<.001
	RESPONSIBILITY	.468	.219	.045	5.659	p<.001

(Continued)

Subject (Criterion)	Predictor Variable	Mult R	R^2	ΔR^2	$F\Delta R^2$	Significance F
Advanced Islamic Knowledge (N=121)	DAY SCHOLAR/BOARDER	.440	.194	.194	10.090	p<.001
	SERIALIST STYLE	.658	.433	.239	17.257	p<.001
	RESPONSIBILITY	.718	.516	.083	6.877	p<.001
Arabic Language (N=117)	DAY SCHOLAR/BOARDER	.891	.795	.795	158.658	p<.001
	INSTRUMENTAL MOTIVATION	.913	.834	.039	9.448	p<.001
	STRATEGIC APPROACH	.927	.859	.025	6.790	p<.001
Chinese Language (N=129)	ACADEMIC STREAM	.375	.140	.140	20.731	p<.001
	RESIDENCY (Urban/Rural)	.443	.196	.056	8.736	p<.001
	CONSCIENTIOUSNESS	.473	.223	.027	4.390	p<.001
	INTRINSIC MOTIVATION	.512	.262	.038	6.455	p<.001
Commerce (N=290)	RESIDENCY (Urban/Rural)	.490	.240	.240	42.920	p<.001
	HOPE FOR SUCCESS	.563	.317	.077	15.203	p<.001
	INTEREST	.592	.350	.034	6.912	p<.001
General Science (N=168)	STRATEGIC APPROACH	.171	.029	.029	4.994	p<.05
	HOPE FOR SUCCESS	.234	.055	.026	4.479	p<.05
Principles of Accountancy (N= 15)	HOLIST STYLE	.743	.553	.553	16.057	p<.001
	COMPLIANCE	.831	.691	.138	5.350	p<.001

"Father's qualification" - about 2% of the variance in Bahasa Malaysia achievement is accounted for by father's qualification, meaning that variation in Bahasa Malaysia achievement is dependent on the variability of whether his/her father has no formal education or educated to the following levels - primary education, junior secondary education, high school/college education or a university graduate. "Interest", "conscientiousness" and "compliance", each contributes about 1% to Bahasa Malaysia variance achievement. Altogether the predictor variables explained 12.1% of achievement variance in Bahasa Malaysia. This denotes the contribution of predictor variables to total percentage variance of achievement in this particular subject area.

English Language - the best predictor is residential status or "day scholars/boarders" and it contributes about 29% of variance in achievement in this subject area. It signifies that this percentage of the variation in students' achievement in English Language is determined by whether or not they stay in school boarding houses or in their own family houses.

Table 4.2C, as we have seen earlier, shows that day scholars have significantly higher mean score than boarders in English Language achievement.

"Father's qualification" contributes about 13% of variance in English Language achievement, which implies that a fraction of the variation in English Language achievement is arbitrated by his/her father's educational quality.

"Academic stream" - Over 8% of the variance in English Language is determined by academic stream, meaning that students' achievement in this subject area is dependent on whether they are in arts or science stream.

"Residency" contributes about 2% to English Language achievement variance. This indicates that achievement in English Language is somewhat dependent on the variability of residential area (urban or rural) from which the students originated.

"Gender", "mother's qualification" and "strategic approach", each contributes about 1% to English Language achievement variance, meaning that variation in English Language achievement, to some extent, is dependent on the variability of whether the student is a boy or a girl, his/her mother is literate or illiterate, and if he/she possesses a strategic approach to learning.

Each of "family size", "holist style", "interest", "serialist style", "fear of failure" and "conscientiousness" contributes considerably less than 1% to English Language achievement variance. As a whole, the predictor variables contribute 57.4% of achievement variance in English Language. Again seven out of thirteen predictor variables provide a significant explanation (more than 1% of achievement variance) for achievement in English Language.

Malay Literature - "Conscientiousness" is the best predictor and contributes over 12% of achievement variance in this subject area. This means that variation in Malay Literature achievement is dependent on the variability of their possession of conscientiousness- the motive of determination to work hard, to carry out what is expected as well as possible.

About 2% of variance in Malay Literature achievement is explained by students' degree of "hope for success". This means that variation in achievement in this subject area is dependent on the variability of scores on such items as 'hate admitting defeat', 'enjoy competing with other pupils in school work' and 'doing things better than others'. Altogether the predictor variables explained 14.2% of achievement variance in Malay Literature.

Fine Arts - Over 12% of achievement variance results from "academic stream" which is the best predictor. This indicates that achievement in Fine Arts is considerably dependent on whether the students came from an arts or a science stream. The finding in Table 4.2A suggests that science-stream students have a significantly higher mean score than arts-stream students in Fine Arts.
"Sociability" provides more than 1% to achievement variance in Fine Arts. Altogether the students' variables only contribute about 14% of achievement variance in Fine Arts.

History - "Optimism" is the best predictor and it contributes more than 15% to achievement variance in History. This implies that achievement in this subject area is dependent on the degree of "optimism" which a student possesses. Each of "deep approach" and "hope for success" contributes about 2% to achievement variance in History. This signifies that History achievement is somewhat dependent on the variability of such sub-scales scores as "deep approach" to learning and "hope for success".Altogether, the students' variables (predictor variables) contribute over 18% of achievement variance in History, as presented in Figure 4B.

Geography - the best predictor is also "academic stream", contributing more than 26% towards achievement variance. This means that students' achievement in Geography is dependent on the actual academic stream (arts or science) in which a student is present. Again, science-stream students (see Table 4.2A) have a significantly higher mean score than arts-stream students in this subject area. "Instrumental motivation" provides an additional 7% to achievement variance , whereas each of "fear of failure", "conscientiousness" and "intrinsic motivation" provides 1% or less to achievement variance. Altogether the predictor variables contribute about 36% of achievement variance in Geography.

Physics - the foremost predictor for students' achievement is "fear of failure". More than 58% of variance in Physics achievement is dependent on the variation in students' scores on "fear of failure", that is, the motives of being anxiously aware of assessment, lack of self-confidence, and worries about being behind with work or doing worse than others.

"Competence" provides an additional 1% to achievement variance in Physics, making the total students' variables altogether contributing over 59% of

achievement variance in this particular subject area.

Biology - the best predictor is "residency" in that over 8% of variance in achievement in this subject area is explained by this variable, meaning that achievement in Biology is considerably dependent on the residential area (urban or rural) from which the students come.
About 4% of achievement variance in Biology is provided by "mother's qualification", indicating that variation in Biology achievement relies considerably on mothers' educational backgrounds. Each of the predictor variables such as "fear of failure","serialist style" and "competence" contributes more than 1% to achievement variance. All in all the predictor variables only contribute about 17% to achievement variance in Biology.

Additional Mathematics - the best predictor in this subject area is also "residency". Over 13% of the achievement variance is explained by whether a student resides in an urban or rural area.
"Family size" contributes 9% to achievement variance in this subject area, suggesting that variation in achievement is dependent on whether a family is large or small.

Each of "fear of failure" and "surface approach" contributes 4% and 2%, respectively, to achievement variance of Additional Mathematics. This signifies that achievement in Additional Mathematics, to some extent, is dependent on the variability of students' degree of fear of failure and the level of their surface approach to learning. Altogether the predictor variables explained 28.4% of Additional Mathematics achievement variance.

Chemistry - the stepwise regression analysis in Table 4.7 shows that "residency" is also the best predictor for achievement in Chemistry, contributing about 16% of achievement variance. This means that the greatest proportion of the variance in students' achievement in Chemistry is determined by whether the students come from an urban or a rural area.

"Serialist style" - about 4% of variance in Chemistry achievement is accounted for by "serialist style", meaning that variation in Chemistry achievement is dependent on the extent to which students adopted a "serialist style" of learning.

Each of "fear of failure" and "strategic approach" contributes about 3% to achievement variance in Chemistry. This denotes that students' achievement in this subject area is considerably dependent on

the variability of their scores in "fear of failure" and"strategic approach", respectively. Also, each of"mother's qualification" and "competence" contributes 2% and 1%, respectively, to achievement variance in Chemistry. This implies that a significant proportion of Chemistry achievement variance is determined by whether their mothers are educated or illiterate, and whether or not students possess competence. All in all the predictor variables contribute only about 25% of the variance in Chemistry achievement.

Modern Mathematics - "Academic stream" is the best predictor where over 68% of variance in achievement in this subject is explained by which stream (arts or science) a student is in.

Table 4.2A reveals that science students have a significantly higher mean score than arts students in Modern Mathematics. Science students are at an advantage as they also take Advanced Mathematics; thus, Modern Mathematics which is more elementary is likely to be much easier for science students. The arts student are not offered Additional Mathematics.

Residential status "day scholar/boarder" contributes an additional 1.3% to achievement variance in this subject area, meaning that a small fraction of

students' achievement in this subject area is dependent on whether the students live with their families at home or stay at school boarding houses (hostels).

Each of "mother's qualification", "fear of failure", "warmth" and "compliance" contributes less than 1% to achievement variance in this subject area. Thus, only two out of six predictor variables provide significant explanations of more than 1% of achievement variance.

Altogether, the predictor variables contribute 71.5% to achievement variance in Modern Mathematics.

Human Biology - "Day Scholar/Boarder" is also the best predictor, contributing 7.5% to variance achievement. This means that achievement in Human Biology is dependent on the students' residential status (day scholars or boarders).

"Family size" provides an additional 2% of the variance for Human Biology achievement which implies that a fraction of this variation in students' achievement in Human Biology is determined by whether or not they come from a big or small family.

All in all the predictor variables explain only somewhat more than 9% of achievement variance in Human Biology.

Elementary Islamic Knowledge - 12.3% of variance in achievement for this subject area is explained by the best predictor "residency (urban/rural)", meaning that student's achievement in this religious subject area is dependent on whether the students come from an urban or a rural community. Over 5% of achievement variance in this subject area results from "mother's qualification". This signifies that the variation in students' achievement in this subject area is considerably determined by their mothers' educational qualifications. In this case, good qualifications in Islamic knowledge and Arabic language are considered essential. "Responsibility" provides an additional 4.5% in predicting Elementary Islamic Knowledge achievement. This signifies that variation in its achievement is dependent on students' own responsibilities to perform well. Altogether the predictor variables contribute 21.9% to achievement variance in this subject area.

Advanced Islamic Knowledge - The best predictor is "serialist style" where the student concentrates initially on facts, details and on the logical interconnections between 'bits' of knowledge and learns best when knowledge is presented formally with a clear structure. Over 23% of this subject's

achievement variance is explained by "serialist style" of learning. This indicates that variation in Advanced Islamic Knowledge achievement is dependent on the variability of serialist-style scores.
"Residential status - day scholar/boarder" contributes 19.4% to achievement variance in this subject area.
This means that its achievement is considerably dependent on residential status, whether the students are boarders or day scholars. Data in Table 4.2C support this outcome whereby boarders have significantly higher mean score than day scholars in Advanced Islamic Knowledge.
Over 8% of variance in Advanced Islamic Knowledge achievement results from student "responsibility". This indicates that variation in achievement is dependent on the extent of a student's responsibility. This responsibility to study and practise such religious matters is likely to be acquired in everyday life for ritual training and purification, and furthermore, Islam is the national religion.
Altogether the predictor variables contribute over 51% to achievement variance in Advanced Islamic Knowledge achievement.

Arabic Language - again "residential status - day scholar/boarder" proves to be the best predictor.

Indeed 79.5% of variance in Arabic language achievement results from students being day scholars or boarders.

Results from Table 4.2C revealed that day scholars have a significantly higher mean score than boarders in Arabic Language. "Instrumental motivation" (interested in qualifications only because of external pressures) contributes 4% of achievement variance to this subject area. An additional contribution of 3% to achievement variance is provided by "strategic approach", meaning that variation in Arabic language achievement is dependent on the variability of scores in the "strategic approach" sub-scale. Altogether the predictor variables contribute 85.9% to Arabic Language achievement variance.

Chinese Language - the best predictor "academic stream" contributes 14% of variance in Chinese language achievement. This denotes that variation of achievement in this subject area is again dependent on what stream (arts or science) a student is in. Earlier in Table 4.2A, we have seen that science-stream students have a significantly higher mean score in Chinese Language than arts-stream students.

"Residency - urban/rural" provides 5.6% of achievement variance in Chinese language. As mentioned in Chapter I, the Chinese (migrant people) are mostly urban dwellers. Thus, their variation in achievement in this subject area is also likely to be somewhat dependent on this factor.
Each of "Intrinsic motivation" and "conscientiousness" contributes 3.8% and 2.7% to achievement variance, respectively. Altogether the student variables contribute over 26% to Chinese language language achievement variance.

Commerce - 24% of Commerce achievement variance is explained by "residency- urban/rural", which is the best predictor. This indicates that achievement variance in this subject area is also dependent on which area (urban or rural) the students come (see also Table 4.2D). Each of the variables "Hope for success" and "interest" contributes 7.7% and 3.4%, respectively, to Commerce achievement variance. As a whole, predictor variables explain 35% of students' achievement variance in Commerce.

General Science - the best predictor is "strategic approach" to learning which contributes 2.9% to achievement variance in this subject area. This

means that achievement in General Science is dependent on the extent to which students possess a "strategic approach", that is, being well-organized, making effective use of time and seeking out appropriate working conditions to earn the best grades possible.

"Hope for success" provides an additional 2.6% to achievement variance in General Science. This indicates that a proportion of the variation in students' achievement in this subject area is dependent on the extent of students' "hope for success".

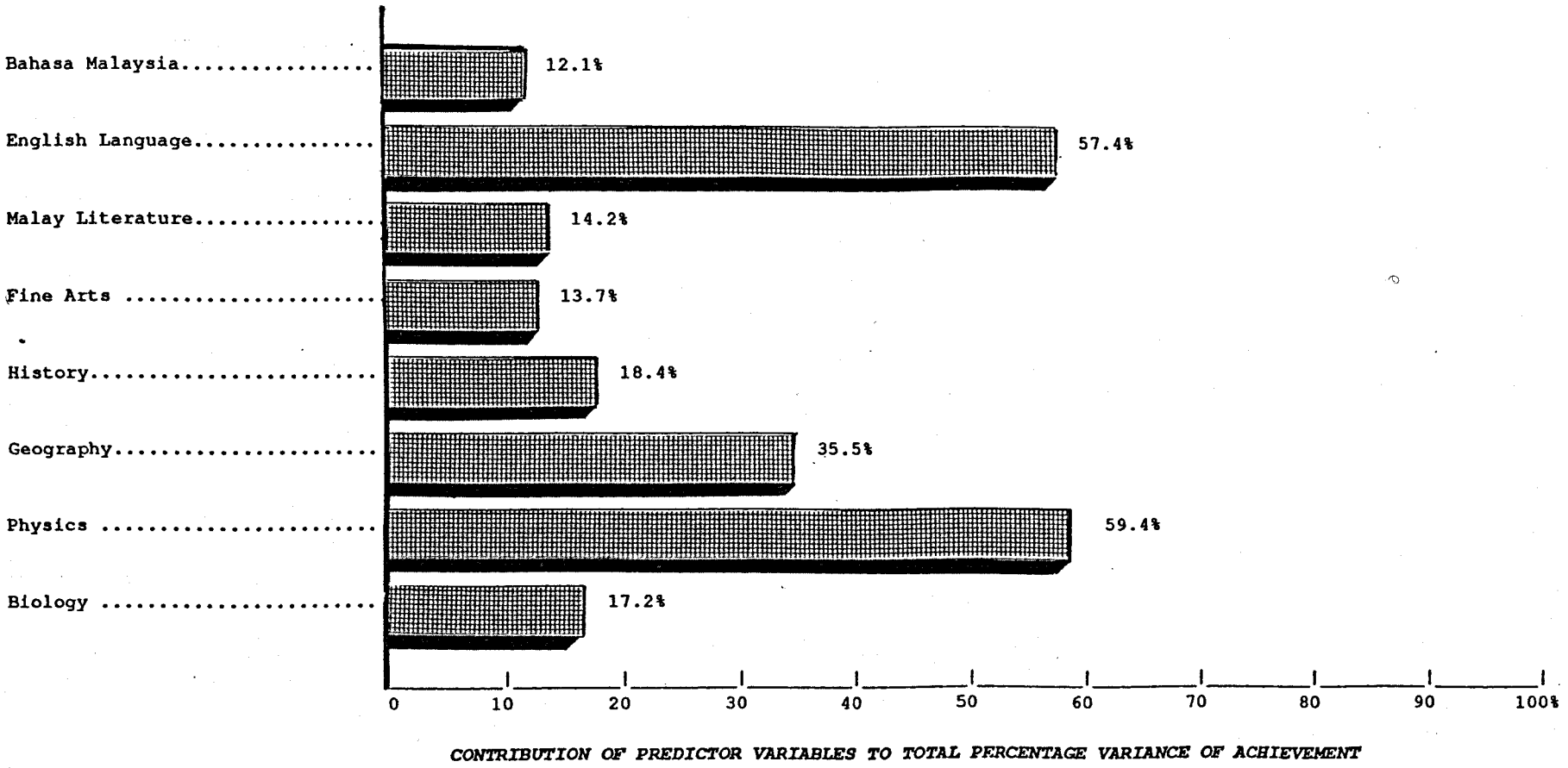
All in all the predictor variables only explained 5.5% of achievement variance in General Science.

Principles of Accountancy - the best predictor is "holist style". Over 55% of achievement variance in Principles of Accountancy is explained by this variable, meaning that variation in achievement in this subject area is dependent on the extent to which students adopt a "holist style" of learning.

"Compliance" contributes about 14% to achievement variance in this subject area. This means that their achievement in Principles of Accountancy is dependent on the variability of students' score in this particular variable.

FIGURE 4D

Multiple Regression Analyses with Total Percentage Contribution of Predictor Variables to Students' Achievement in Each Subject Area.



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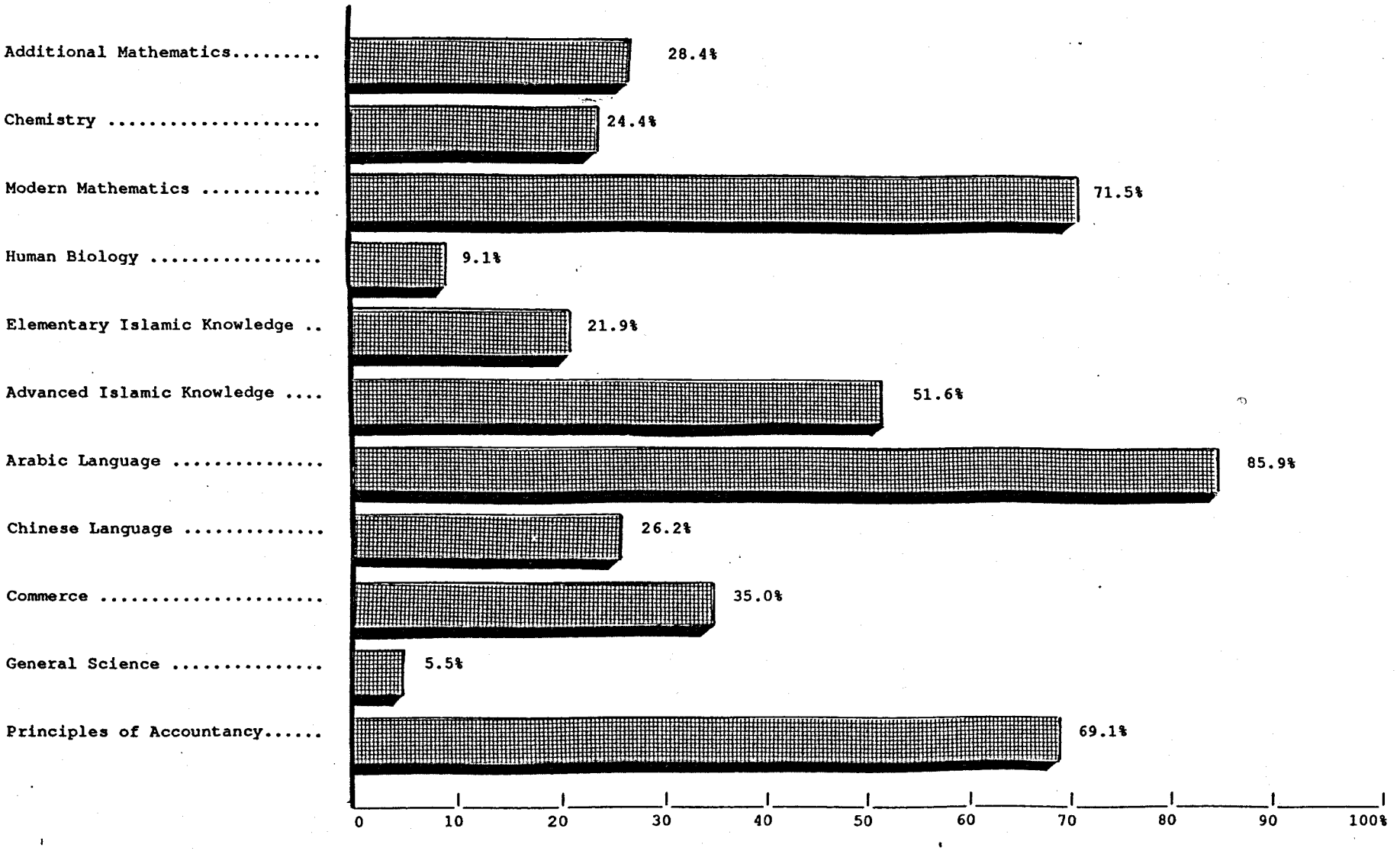


CONTRIBUTION OF PREDICTOR VARIABLES TO TOTAL PERCENTAGE VARIANCE OF ACHIEVEMENT.

Altogether the predictor variables explained more than 69% of achievement variance in Principles of Accountancy.

Figure 4D portrays the findings in Table 4.7 more precisely. It provides, using a bar chart,the total contribution of all the selected predictor variables to students' achievement in each subject area in terms of the total percentage variance.

4.5.3 The contribution of school motivation, learning styles and approaches, locus of control and optimism to achievement within different ethnic groups.

The results of stepwise regression analyses in assessing the contribution of predictor variables to achievement within different ethnic groups are presented in Table 4.8. Note that achievement is based on any six best subject areas including Bahasa Malaysia as measured by the **Sijil Pelajaran Malaysia** external examination (see Chapter III). The total contribution of these variables in terms of percentage variance of achievement for each ethnic group is presented in Figure 4E. Some of these features from the results in Table 4.8 merit comments.

TABLE 4.8

Stepwise Regression: The contribution of school motivation, learning approach, learning style, locus of control and optimism to achievement within ethnic group

Ethnic Group (Criterion)	Predictor Variables	Mult R	R^2	$\triangle R^2$	$F \triangle R^2$	Significance F
MALAY	RESPONSIBILITY	.350	.122	.122	12.823	p<.001
(N=345)	STRATEGIC APPROACH	.443	.196	.074	8.376	p<.001
	COMPETENCE	.506	.256	.060	7.216	p<.001
	CONSCIENTIOUSNESS	.549	.301	.045	5.722	p<.001
IBAN	STRATEGIC APPROACH	.467	.218	.218	5.291	p<.001
(N=73)	HOPE FOR SUCCESS	.651	.424	.206	6.431	p<.001
MELANAU	SOCIABILITY	.356	.127	.127	4.784	p<.05
(N=35)						
CHINESE	INSTRUMENTAL MOTIVATION	.327	.107	.107	34.976	p<.001
(N=315)	HOPE FOR SUCCESS	.397	.157	.051	17.426	p<.001
	FEAR OF FAILURE	.429	.184	.027	9.527	p<.001
BIDAYUH	INSTRUMENTAL MOTIVATION	.278	.007	.007	4.426	p<.05
(N=139)	LOCUS OF CONTROL	.395	.156	.049	4.850	p<.05
	COMPLIANCE	.472	.223	.067	4.409	p<.05
	SURFACE APPROACH	.539	.290	.067	4.726	p<.001
	CONSCIENTIOUSNESS	.653	.303	.013	9.293	p<.001
*OTHERS**	LOCUS OF CONTROL	.540	.292	.292	5.349	p<.05
(N=18)						

Note: * Other ethnic groups consist of: 8 Javanese; 3 Kayans; 3 Kenyah; 2 Kelabits; 2 Indians.

a. Malay

In the case of Malay students, "responsibility" - students' accepting responsibility for their own action, is the best predictor. Over 12% of variance in Malay students' achievement is explained by their degree of "responsibility", meaning that variation in their achievement is dependent on the extent to which they accept "responsibility".

- a "Strategic approach" to learning, that is, actively seeking information about assessment requirement, intending to get the best grades possible by being well-organized, making effective use of time and seeking out appropriate working conditions, is another salient factor predicting over 7% of variance in their achievement. In other words, the variation in Malays' achievement is partly determined by whether or not they possess a "strategic approach" to learning.

- "Competence", the motive of seeking knowledge and being self-confident, provides an additional 6% to Malay students' achievement variance.

- "conscientiousness" (determination to carry out what is expected as well as possible) contributes 4.5% of variance of Malay students' achievement. Altogether, the students' variables contribute 30.1% to Malay students' achievement variance.

b. Iban

"Strategic approach" is the best predictor and provides over 21% of variance in Iban students' achievement. This means that their achievement, to some extent, is dependent on the variability in scores on such items as 'working out how to get highest possible marks', 'seeking information about assessment requirement', 'preventing social/personal life interfering with studying' and 'organizing study time effectively'.

With the predictor "Hope for success" more than 20% of Ibans' achievement variance is accounted for by variations in their scores on such items as 'hates admitting defeat', 'enjoys competing with other students on school work' and 'determines to do better than others'. All in all the predictor variables contribute 42.4% to Iban students' achievement variance. Thus, Iban students have the most contribution from predictor variables to the total percentage variance of achievement compared with other ethnic groups, as shown in Figure 4D.

c. Melanau

The best and the sole predictor to Melanau students' achievement is "sociability". Over 12% of variance in their achievement is explained by variations in scores on such items as 'being in good relationships with others','enjoys helping others with school work' and 'acceptance at school'. Thus, the total predictor

variable (in this case, only "sociability") contributes 12.7% to Melanau students' achievement variance.

d. Chinese

"Instrumental motivation", involving being interested in only qualification, concerned with vocational and economic opportunities and works only because of external pressures, is the best predictor contributing 10% to Chinese students' achievement variance. This indicates that their achievement is considerably dependent on the extent to which they possess "instrumental motivation".

"Hope for success", being competitive and determined to do better than others, is another salient factor contributing over 5% to Chinese students' achievement variance.

"Fear of failure" provides an additional 2.7% of Chinese students' achievement variance. This indicates that their achievement, as well, is dependent on the variability of such items as 'anxiety about examination', 'lack in self-confidence', and 'worry about being behind with work or doing worse than others'.

As a whole, students' variables explain 18.4% of Chinese students' achievement variance.

e. Bidayuh

The best predictor of overall achievement with this ethnic group is "conscientiousness". Over 11% of their

achievement variance is accounted for by their degree of "conscientiousness", meaning that variations in Bidayuhs' achievement is dependent mostly on the variability of "conscientiousness" (determination to carry out what is expected as well as possible) scores.

Each of the predictors "compliance" and "surface approach" provides an additional 6.7% to their achievement variance. This means that Bidayuhs' achievement, to some extent, is dependent on the variability of such items as 'acceptance of social norms','higher-order moral values', 'religious beliefs' and 'compliance with responsible demands'. Their achievement is also considerably dependent on their degree of possessing a "surface approach" to learning.

"Locus of control" and "instrumental motivation" contribute 5% and 1% to achievement variance, respectively. This signifies that a proportion of the variation in Bidayuhs' achievement is determined by whether they possess 'internal' or 'external' locus of control and dependent less (only 1%) on the variability of "instrumental motivation" scores. Altogether the students' variables contribute 30.3% to Bidayuh students' achievement variance.

f. Others

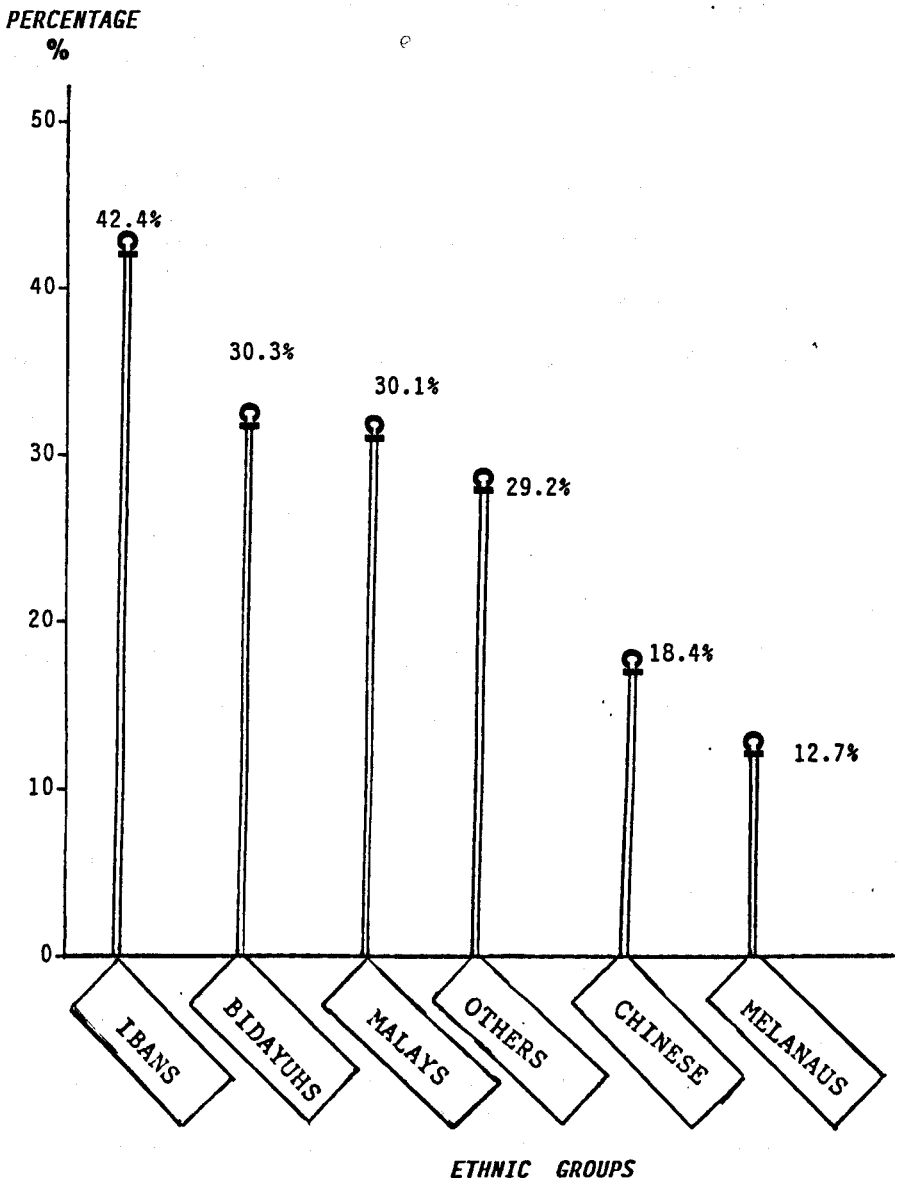
- Others consist of the Sarawak indigenous ethnic groups: Kayan, Kenyah and Kelabit; and non-indigenous ethnic groups (migrants) namely the Javanese (Indonesian) and Indian (see Chapter I). The sole predictor for this group is "locus of control". 29.2% of their achievement variance is explained by their level of "locus of control". Thus, we can say that the variations in these minority ethnic groups' achievement is dependent on the extent to which they possess 'internal' or 'external' locus of control. As the sole predictor, the total contribution is only 29.2% to achievement variance for this mixed ethnic group.

4.5.4 The most important variables predicting student overall examination achievement in (a) Arts stream and (b) Science stream.

The stepwise regression analyses used to handle the last research question (see Chapter I) are presented in Table 4.9A and Table 4.9B. These tables indicate the most important variables predicting achievement in both the arts stream and the science stream. Some of these features of Table 4.9A and Table 4.9B merit comment:

-In regards to the arts stream (see Table 4.9A), the best predictor is "warmth". Over 10% of variance in

FIGURE 4E
Contribution of Predictor Variables to Total Percentage Variance of Achievement in Each Ethnic Group



arts stream achievement is explained by "warmth" motivation, meaning that variation in arts stream's achievement is dependent on the variability of such items as 'empathy from parents' and 'warm relationships with parents, friends (peer groups) and teachers'. As for the science stream, the best predictor is "residency - urban/rural" which contributes about 18% to achievement variance in the science stream. This means that science stream's achievement is dependent on the residency (urban or rural) from which the students come.

- "Father's qualification" contributes over 2% to achievement variance in the arts stream. On the contrary, it is "mother's qualification" which contributes about 4% to achievement variance in the science stream. This signifies that (i) variation in arts stream's achievement is dependent on the sophistication of their fathers' educational background, and (ii) variation in science stream's achievement is similarly determined by their mothers' level of education such as no formal education, primary education, secondary education, college or university graduate.

- In regards to the arts stream, "fear of failure" contributes only 1% to examination achievement

TABLE 4.9A
Stepwise Regression: Examining The Most Important Variables
Predicting Achievement In Arts Stream
(N= 593)

Predictor Variables	Mult R	*Criterion: Achievement In Arts Stream* R^2	ΔR^2	$F \Delta R^2$	Significance F
Warmth	.324	.105	.105	68.966	p<.001
Competence	.369	.136	.031	21.216	p<.001
Sociability	.411	.169	.033	23.170	p<.001
Father's Qualification	.435	.190	.021	14.774	p<.001
Compliance	.455	.207	.017	12.644	p<.001
Fear of Failure	.465	.216	.010	7.044	p<.001
Serialist Style	.474	.224	.008	6.115	p<.001
Interest	.482	.232	.008	6.106	p<.001
Family Size	.489	.239	.007	4.990	p<.001
Deep Approach	.495	.245	.006	4.295	p<.001

TABLE 4.9B
Stepwise Regression: Examining The Most Important Variables
Predicting Achievement In Science Stream
(N= 332)

Predictor Variables	Mult R	*Criterion: Achievement In Science Stream* R^2	ΔR^2	$F \Delta R^2$	Significance F
Residency (Urban/Rural)	.423	.179	.179	71.994	p<.001
Fear of Failure	.481	.232	.053	22.523	p<.001
Mother's Qualification	.520	.270	.038	17.272	p<.001
Serialist Style	.530	.281	.011	4.756	p<.001
Family Size	.538	.290	.009	4.243	p<.001
Optimism	.546	.298	.008	3.897	p<.001

R^2 - R Square ΔR^2 - Change in R Square $F \Delta R^2$ - F Change

variance; as compared to its contribution of over 5% to achievement variance in the science stream. This means that variation in science stream's achievement is more dependent on the variability of "fear of failure" scores than in arts stream's achievement.

- A "serialist style" to learning which concentrates initially on facts, details, and on the logical interconnections between 'bits' of knowledge and learns best when knowledge is presented formally with a clear structure, contributes about 1% to both variances in arts stream's achievement and science stream's achievement. This indicates that examination achievement in both arts and science stream, to a certain extent, is dependent on the degree to which they possess a "serialist style" to learning.

- "Sociability", "competence", "compliance", "interest" and "deep approach" contribute only to the arts-stream group. An additional 3.3%, 3.1%, 1.7%, 1% and 1% of overall achievement variance in arts stream is accounted for by the above variables, respectively. This means that variation in arts stream's achievement is considerably dependent on whether or not the arts stream students possess "sociability,

competence, compliance, and interest" and the extent to which they adopt a "deep approach" to learning.

- "Optimism" contributes only 1% to overall achievement variance in science stream. It denotes that achievement in science stream is somewhat dependent on the degree of optimism which students in the science stream possess.

- "Family size" is another variable predicting both arts and science steams' achievement variance. It contributes about 1% each to arts and science streams achievement variance, indicating that a very small fraction of their achievement is dependent on whether they come from a small or big family. Altogether the predictor variables explained 24.5% of overall achievement variance (see Table 4.9A) for arts-stream students. In regards to the science stream,the total contribution of predictor variables to their overall achievement variance is slightly higher, that is 29.8%, as presented in Table 4.9B.

A summary of main findings, further discussions, suggestions and conclusions will be dealt with in the next and final chapter - the Discussion Chapter.

CHAPTER V

SUMMARY, DISCUSSION AND CONCLUSION

5.0 Summary Presentation and Discussion of Results

This chapter is devoted to reviewing the major findings to give an overall picture of what they may mean. As this is a somewhat policy-oriented *ex post facto* study, the researcher will, also, offer his recommendations to counteract some of the major factors that are associated with low academic achievement among high school students in Sarawak. Based on the findings of this study, the researcher shall also offer suggestions for further research, as Evans (1965:143) noted:

> New research is founded on existing knowledge, and new techniques evolve from old ones. What is important is that no result shall be considered as providing a final answer, and the educationists shall go on asking questions about their aims and methods.

5.1 The t- Test Results

This section comprises two parts. The first part involves a summary of results obtained from the 't' analyses which enabled the hypotheses to be tested. The appropriate use of the 't' test is discussed in investigating differences between means of two independent groups: (a) science and arts students; (b) boys and girls; (c) day scholars and boarders; (d) urban and rural

students; and (e) high achievers and low achievers. The second part focuses on the findings of the main hypotheses.

Tables 4.1A to 4.1E revealed the mean differences between each pair of these groups on the variables school motivation, learning approaches, learning styles, locus of control and optimism. Tables 4.2A to 4.2B showed the mean differences for these variables between the mentioned groups in each subject area. From these 10 tables, the results of the 't' test could be summarised as follows:

Science-Arts students

The science students (science-stream students) have a significantly higher mean score than the arts students in "compliance", meaning that science students possess more compliance with norms than arts students. According to Kozeki's model (1985:195), "*This type of pupil is achievement-oriented, but not success-orientated. He is emotionally independent of others. The strong moral motives imply not only interest in academic work but also in doing it well, living up to what is expected*". Indeed, this supports other findings where mean scores on achievement for science students are considerably higher than arts students in each area, as presented in Tables 4.0B and Figure 4A in the former chapter.

The science students have also a significantly higher mean score in "conscientiousness", indicating that science students are likely to be more conscientious, trustful and possess higher self-esteem than arts students.

In learning approaches and styles, science students also have significantly higher mean scores than arts students in the variables "deep approach", "holist style" and "serialist styles" of learning. These results indicate that science students are most likely to adopt a deep approach to learning and to possess holistic and serialist styles of learning. This finding does not support what Entwistle (1988) noted as 'holist styles are more suitable for learning in humanities, and serialist style in science'. In fact, the finding is in line with what Pask (1976a) refers to as "versatile", where students are equally comfortable with either holist or serialist styles and use each as appropriate. A deep approach if related to a holist style (but not with a serialist style) of learning, according to Entwistle and Ramsden (1983),will form a "meaning orientation". A serialist style of learning is another contrasting factor associated with a surface approach to learning and these form a "reproducing orientation". Thus, it is possible that science students are more likely to possess "meaning orientation" (search for personal understanding) and possibly a "reproducing

orientation" (memorization) than arts students.

In regard to achievement, science students also gain significantly higher mean scores than the arts students in all subject areas. This signifies that the achievement of science students is distinctly better than arts students in all academic subjects taken in the **Sijil Pelajaran Malaysia** external examination. One of the reasons is that, in the first place, the selection of students to the science stream on entering high school (Form IV) was based on their best results in the **Sijil Rendah Pelajaran [SRP]** (Lower Certificate of Education) external examinations. Thus, science-stream students are generally selected from students with good results in the **SRPM**, and it is not surprising that they continue to achieve significantly better than arts-stream students in all subject areas.

Arts students, on the other hand, have significantly higher mean scores in "hope for success" and "optimism" than science students. This indicates that arts students are likely to possess more hope for success and to be more optimistic than their counterparts.

Arts students are also more likely to rely on a "strategic approach" to learning as they have a significantly higher mean score on this variable compared to science students. Based on Entwistle's learning theory,

a strategic approach indicates a use of both deep and surface approaches to learning and when supported by hope for success, as in this case, will form an "achieving orientation", that is, doing whatever is necessary to earn high grades (see Schmeck, 1983).

Girls- Boys

Girls are likely to feel a greater "fear of failure" than boys as their mean score is significantly higher on this motivational variable. This finding is in line with the gender-link differences, noted by Nowicki (1973), Duke and Nowicki (1978), where female college students were more afraid of failure than males. Fox (1980) and Fennema (1984), also, found that females often feel less confident (fear of failure) in learning mathematics and this attitude appears at least by fourth grade and continues to exist throughout high school.

Girls have also a significantly higher mean scores than boys in "conscientiousness", meaning that girls are likely to possess more determination in carrying out what is expected of them as well as possible. Lipman-Blumen and Bernard (1980) found that female achievers in the story cue, as well as the relationships between the characters, adopted an achieving orientation. "Conscientiousness", a competitive motivation, goes together with achieving orientation (doing whatever is necessary to earn high

grades) in Entwistle's and Ramsden's (1983) learning theory. Thus, the present study which shows that girls are considerably more conscientious than boys seems to be in line with the previous study by Lipman-Blumen and agrees with the findings on perceived achieving orientation suggested by Entwistle et al. (1979) and Entwistle and Ramsden (1983).

With the variable "locus of control" girls, also, have a significantly higher mean score than boys. This means that girls are most likely to be more "external" than boys. In other words, girls tend to see their achievement as possibly caused more by luck or environmental conditions rather than their own abilities and efforts. In support to this finding, Nowicki (1973), using correlation analysis, found that female achievement was associated with "external" locus of control, indicated by a positive correlation ($r = .39$, $p < .05$, $N = 26$) while male achievement was associated with "internal" locus of control, indicated by a negative correlation ($r = -.50$, $p < .02$, $N = 22$). Subsequently, replication of these data were found by Duke and Nowicki (1978) where female college students' achievement was significantly correlated with "external" locus of control ($r = .63$, $p < .01$, $N = 40$) and male students' achievement with "internal" control ($r = -.48$, $p < .01$, $N = 38$).

Concerning achievement in subject areas, girls have significantly higher mean scores than boys in English language and Malay Literature. In contrast, boys have only one significantly higher mean score than girls and that is in History.

Boys have a significantly higher mean score in "holist style" of learning than girls, meaning that boys are more likely to adopt a holist style of learning. There are no significant gender differences with other variables such as school motivation, learning approaches, learning styles and optimism apart from the above.

In History, boys obtained a significantly higher mean score than girls. Ridzuan (1984) who studied the textbooks and materials used in Form IV and Form V in Malaysia, found that textbooks in History and Science were male dominated, with men in the most powerful and active roles. Science and History textbooks revealed famous scientists, warriors and national patriots as being mainly males. Malay Literature textbooks also focus more on male characters in plays and novels, with poetry being an exceptional as poems tended to focus on female characters or ideas symbolized by "flowers". Girls tended to do better in Malay Literature partly because they like love stories, classical fantasies, folk stories, romantic poems and plays which provide stereotypical 'feminine' attractions.

Day Scholar- Boarder

Day scholars have a significantly higher mean score than boarders in "interest", meaning that day scholars are likely to possess more interest in their study. "Interest" falls under Kozeki's "Cognitive Domain" and according to him (Kozeki, 1985: 193), "This pupil works very effectively and may well be creative, but the lack of any strong moral dimension indicates a tendency towards selfishness and non-comformity. He is strongly motivated towards competence, but supporting of affiliation indicates the need for applause".

As day scholars tend to be more interested in their study, they are also likely to obtain better achievement than boarders in each subject area. Indeed, Table 4.2C shows that day scholars have significantly higher mean scores than boarders in almost all subject areas, except in Bahasa Malaysia (Malay Language) and Elementary Islamic Knowledge. In spite of their significantly higher achievement than the boarders in the majority of subject areas, day scholars have a significantly higher mean score than the boarders in "instrumental motivation". This indicates that day scholars are more likely to be interested in qualifications and possible vocational and economic opportunities, and to work only because of external pressures. Day scholars, who are city or urban dwellers, are likely to be more exposed to the challenging world and

thus, tend to be more instrumentally motivated than boarders who are from rural or country areas.

Boarders, on the other hand, have a significantly higher mean score than day scholars for the variable "fear of failure", suggesting that boarders are likely to acquire more of this motive which, according to Birney *et al.* (1969), brings them success eventually. Mahone (1960) has found that those higher on achievement motivation (n-Ach) are more realistic in career choices than those high on fear of failure. Atkinson (1964) noted that with those having high fear of failure, moderately difficult tasks create the greatest anxiety. With easy tasks there would be no problem; with difficult tasks there are similarly no perceived problems because the *negative* incentive of failing is small. Thus, the boarders who have high fear of failure are likely to be unrealistic in career choices. Malaysia has a high unemployment rate, amounting to 448,600 in 1985 from an earlier total of 292,000 in 1980 (5.7% of the work population) and this rose to 7.7% in 1985 (Government of Malaysia, 1986). Job seekers tend to accuse the Government of not being able to handle inflation problems and of having to freeze some jobs. As most of the university and college graduates are 'boarders' or with residential status, the researcher presumes that they are also likely to possess high fear of failure and thus one of the reasons for unemployment in Malaysia is probably

because job seekers tend to be too choosy or unrealistic in career choices. The finding supports Atkinson's (1964) suggestion that fear of failure is likely to go with anxiety and unrealistic in career choices.

The boarders also have a significantly higher mean score than day scholars in "strategic approach" to learning, indicating that boarders are likely to be well-organized in their study so as to get the best grades possible. This approach indicates a use of both deep and surface approaches to learning.

Results in Table 4.1C show that boarders also obtained a significantly higher mean score than day scholars in "optimism". This suggests that boarders are considerably more optimistic in that is they expect things to work out well, as compared with day scholars.

Urban-Rural

Urban students obtained significantly higher mean scores than rural students on such school-motivation variables as "interest", "instrumental motivation" and "conscientiousness". This indicated that urban students are likely to possess more of these motives than their counterparts. It was also found that urban students have a significantly higher mean score than rural students in "holist style" of learning, as presented in Table 4.1D.

According to the Pask's (1976a) model, these students tend to concentrate initially on a broad view of a topic, learn best by making use of analogies and illustrations, prefer anecdotal personalized teaching. They tend to generalise too readily and reach conclusions on inadequate evidence.

On learning achievement urban students have significantly higher mean scores than rural students in eleven out of the thirteen subject areas which include English Language, Fine Arts, Geography, Modern Mathematics, Human Biology, Chinese Language, Principles of Accountancy, Physics, Biology, Chemistry and Additional Mathematics. This indicates that, as a whole, urban students achieved considerably better results in the SPM external examination than rural students. The higher achievement amongst urban students may be partly due to better school facilities, more research centres and public libraries and more graduate teachers in the urban schools as compared with these facilities in rural areas (Hirschman 1972, Ahmad 1981).

Rural students, in contrast, have significantly higher mean scores than urban students in "optimism" and "locus of control". This signifies that rural students are considerably more optimistic and possess more "external" locus ofcontrol as compared with urban students.In academic achievement, as mentioned earlier, rural students have

significantly higher mean scores only in two subject areas, namely Bahasa Malaysia (Malay Language)and Elementary Islamic Knowledge.

High Achievers- Low Achievers

High achievers have a significantly higher mean score than low achievers in "serialist style" of learning, meaning that they are likely to rely more on the style of learning which Pask (1976a) refers to as "concentrate initially on facts, details, and on logical interconnect-ions between 'bits' of knowledge or steps in the argument and learn best when knowledge is presented formally with a clear structure". According to Entwistle's learning theory (see Entwistle and Ramsden, 1983), "serialist style" (a narrow, cautious stance relying on evidence and logical analysis) goes together with a surface approach to learning to form a "reproducing orientation". Thus high achievers are likely to rely considerably on memorization.

With academic achievement in each subject areas, as expected from their overall performance, high achievers have significantly higher mean scores in all subject areas except in Principles of Accountancy.

Low achievers have significantly higher mean scores than high achievers in two of the school motivation scales, namely, "fear of failure" and "hope for success". Although

they possess two contradictory motivations, the "fear of failure" is obviously the more significant.

Low achievers are also likely to possess a more "strategic approach" to learning, as they have a significantly higher mean score on this scale than high achievers. In other words, even though they achieve considerably low grades, this group of students consider that their work is well-organized, they make effective use of time and seek out appropriate working (learning) conditions to get the best grades possible.

5.2 The Research Questions

The second part of this section discusses the main findings. The following research questions are answered (see Chapter IV) and much of the information provided in Tables 4.3 to 4.9 will be dealt with in this section. The first three analyses (Questions 1 to 3) were to find possible relationship between achievement of students in different subject areas and each of the variables school motivation, learning approaches, learning styles, optimism and locus of control.The researcher employed the Pearson's product-moment correlation analyses to measure the degree of relationship between these variables. Wiseman (1966) noted that the Pearson's product-moment correlation coefficient is the most reliable of all coefficients,

particularly in the form used in this study whereby the coefficients are compared from similar data. The analyses were undertaken for the mixed samples of boys and girls, arts-stream and science-stream students, urban and rural students, boarders and day scholars, and high achievers and low achievers. The results obtained are presented in Tables 4.3, 4.4 and 4.5.

Questions 4 to 7 were to look for the most important predictor variables (students' variables) such as gender, residency, day scholar/boarder, school motivation, learning approaches and styles, locus of control and optimism contributing to student achievement in: (a) the whole ***Sijil Pelajaran Malaysia (SPM)*** external examination in Malaysia; (b) different subject areas; (c) different ethnic groups; and (d) arts and science streams. The statistical technique used in these 'predictive' analyses was stepwise multiple regression. Guilford (1965) and Draper and Smith (1966) proclaimed that no method is so well-suited to estimation or prediction analyses as multiple regression, particularly the stepwise regression procedure. The findings for these research questions are revealed in Tables 4.6A-B, 4.7, 4.8 and 4.9A-B.

A discussion of the findings to Question 1 and Question 5 will be undertaken simultaneously because these two questions deal with students' achievement in each

subject area. It is necessary to recall the research questions mentioned in Chapter 1 as we go through the discussion.

Q.1: *What are the relationships between school motivation, learning approaches, learning styles and academic achievement of students in different subject areas?*

Q.5: *What are the most important predictor variables contributing to student achievement in different subject areas?*

Bahasa Malaysia - achievement in Bahasa Malaysia has significant negative correlations with "interest", "hope for success", "deep approach" to learning, and "conscientiousness". These negative correlations indicate that students' low achievement in Bahasa Malaysia is significantly associated with: (a) "lack of interest" in the subject area; (b) "lack of hope for success"; (c) do not rely on a "deep approach" to learning; and (d) do not possess "conscientiousness". In other words, high achievers in Bahasa Malaysia are likely to have more "interest" and enthusiasm; more "hope for success", that is, more determination to do better than others; likely to adopt a "deep approach" to learning (looking for meaning and vigorous interaction with content); and be highly "conscientious". The latter means that high achievers have more determination to carry out what is expected of them as well as possible.

The attitude "lack of interest" in Bahasa Malaysia as the official language can be seen not only among school children but also among political leaders and high ranking officers both in the government and the private sector. English language is still widely in use in some legal courts, conferences, general meetings and correspondences. These tendencies result from past history (see Chapter I), and may only be remedied through a more concerted policy such as: (a) the Government considering draconian measures such as those taken in some other countries (for instance, in Burma, Indonesia and Uganda) of either expelling those considered recent immigrants or nationalizing their properties in an effort to correct perceived imbalances in social or economic power; or (b) at least for the Razak (1956) Committee, in the first place, to pursue the policy recommended by the Barnes (1952) Committee of having a single type of national primary school so that the immigrant (non-indigenous) population is assimilated more readily into the Malaysian society rather than having different types of primary schools - Malay, Chinese and Tamil, as we have today.

Steps taken by the Sarawak Education Department to convert all Government and Government aided English primary schools into national primary schools by making Bahasa Malaysia as the medium of instruction beginning at primary school level did not start until 1977, whereas in

Peninsular Malaysia, Bahasa Malaysia (then called the 'National Language') was made compulsory right from the time of achieving independence from Great Britain in 1957. This means that Bahasa Malaysia was fully implemented in Sarawak only in 1989 to all levels from primary one to the senior levels of high schools. The usage of Bahasa Malaysia in Peninsular Malaysia has been well-established, but not in Sarawak. The Bahasa Malaysia language in Sarawak has been somewhat neglected by the State and Federal Governments:

> ...the present policy and system of administration of education in Sabah and Sarawak (including their present Ordinance) should be undisturbed and remain under the control of the Government of the State until the Government otherwise agrees.
> (Ministry of Education Malaysia, 1970: 31).

The implementation of Bahasa Malaysia is very slow and it was not until 1985 that the State Government made it the official language to be used in all government departments and the private sector. In 1989 Bahasa Malaysia was for the first time fully used in schools (Ridzuan, 1985). Any comments supporting the *status quo* such as *"The teaching and learning of Bahasa Malaysia, Chinese, Tamil and English languages will be improved through the provision of more trained teachers" (Government of Malaysia, 1986: 497)*, may put Sarawak students of various ethnic groups or races into some confusion as to

the importance of Bahasa Malaysia compared with English language and their own languages.

Achievement in Bahasa Malaysia has significant positive correlations with "sociability" and a "surface approach" to learning. These results suggest that students' low achievement in Bahasa Malaysia has a link with: (a) their "good relationships with others and are well accepted at school". In other words, if students are too sociable they may neglect their study which may lead them to low achievement; and (b) a "surface approach" to learning, meaning that low achievers in Bahasa Malaysia 'intend to carry out task requirements in a mechanical way without personal involvement, try to identify discrete 'bits' of knowledge to memorize and are over-reliant on the teacher to provide a framework within which to learn and study' (Marton and Saljo, 1976a). Rohana Zubir (1988) refers to this as the "spoon-feeding syndrome" among Malaysian students.

The most important predictor variable contributing to student achievement in Bahasa Malaysia is "Day Scholar/ Boarder", as revealed in Table 4.7. About 7% of achievement variance in the Bahasa Malaysia is explained by whether he/she is a day scholar or a boarder. The 't' test in Table 4.2C shows that boarders have a significantly higher mean score than day scholars in Bahasa Malaysia. This is partly

due to the Education Department policy that requires students with competence in Bahasa Malaysia and good examination results to have priority on being considered for a boarding place.

"Father's qualification" contributes about 2% of the variance in Bahasa Malaysia achievement, meaning that variation in Bahasa Malaysia achievement is dependent on the variability of whether his/her father has no formal education, primary education, junior secondary education, high school/college education or a university graduate. By tradition, a father who is the head of the family, plays an important role in providing and determining education to their children.

The variables "interest", "conscientiousness" and "compliance", each contributes about 1% to Bahasa Malaysia achievement variance. Overall the predictor variables contribute only 12.1% to achievement variance in Bahasa Malaysia and the rest which is over 80% may rely on students' own I.Q (intelligence quotient) and cognitive abilities.

English Language - achievement in English Language is significantly correlated with the variables "fear of failure" and "intrinsic motivation", suggesting that low achievers in this subject area are significantly related to

"fear of failure", that is, they are worried about being behind with work or doing worse than others. Low achievers in English Language are likely to possess more fear of failure than high achievers because they know that English Language, although not compulsory, is the second most important language and failure in this subject area may affect the 'grouping' requirement in the SPM external examination (see Chapter II). This may lead to failure in the whole examination or being awarded only 'Sijil Am Pelajaran' (General Certificate of Education). Low achievers are likely to possess "intrinsic motivation". This implies that low achievers are likely to be more interested in the subject matter itself, more excited by academic topics and intellectual ideas than high achievers in this subject area.

Significant negative correlations are found in the relationships between students' achievement in English Language and "strategic approach", "serialist style", "holist style" and "conscientiousness". These negative correlations indicate that high achievers in English Lang-
uage:

(a) are also high on adopting a "strategic approach" to learning. This possibly means that the high achievers in this subject area 'do try to organize time and distribute effort to obtain highest possible

grades'.

(b) have possession of either a "serialist style" or a "holist style" of learning. Thus, several styles of learning are more predominant with high rather than low achievers in English language.

(c) are associated significantly with "conscientiousness", suggesting that being conscientious (determined to carry out what is expected of them as well as possible) is a salient factor determining high achievement in English Language.

The results in Table 4.7 show that the best predictor of achievement in English language is residential status or "day scholar/boarder". It contributes about 29% of variance in English Language achievement. This signifies that, to some extent, students' achievement in this subject area is dependent on whether they stay in school boarding houses or in their own family houses. The 't' test results in Table 4.2C show that day scholars have a significantly higher mean score than boarders in English Language achievement. This is probably because day scholars meet and mix with "English-speaking" people on the streets, emporiums, supermarkets and public libraries more frequently in their everyday life than the boarders who are only allowed to go out once in a fortnight or so. Also, boarders tend to come from far-distant places or from rural areas, whereas day scholars tend to be city or urban dwellers where

educational facilities are much more accessible (Hirschman, 1972).

"Father's qualification" contributes about 13% of variance in English Language achievement which is a much greater contribution than that for Bahasa Malaysia achievement. This implies that quite a big fraction of the variation in English Language achievement is dependent on the quality of a father's educational attainment. Although no empirical study has been made, the researcher presumes that some "elite fathers" who are mostly graduates from the U.S.A, Australian, U.K. and New Zealand universities tend to provide their children with private English Language tuition or send their children to English schools abroad. Apart from that, these "elite" groups tend to speak English to their families at home. According to the Government of Malaysia (1986), as discussed in Chapter I, out of 60,000 students studying overseas, almost 11,000 were private students who are sponsored by their own parents and 49,000 were government sponsored. There were only 20,000 students pursuing overseas courses at first-degree level and the remainder 40,000 were likely to be secondary, polytechnic or post-graduate students. These figures show that there are still a number of Malaysian parents who rely on an English type education.

The variable "academic stream" contributes over 8% to the variance in English Language achievement, indicating that students' achievement in this subject area is dependent on whether they are in the arts or science stream. Table 4.2A shows that science-stream students have a significantly higher mean score than arts-stream students in English Language achievement. This is probably because most of the science textbooks and reference books for high school students are still in the English Language although the Government has taken steps to translate these books into Bahasa Malaysia and to encourage more publications from local scholars.

"Residency" contributes about 2% to English Language achievement variance. This indicates that achievement in English Language is somewhat dependent on the variability of residential area (urban or rural) from which the students originated. The 't' test in Table 4.2D shows that urban students have a significantly higher mean score than rural students in English Language. This is probably due to what Hirschman (1972) refers to as "more accessible educational facilities in urban than rural areas".

The variables "gender", "mother's qualification" and "strategic approach" each contributes about 1% to English Language achievement variance, meaning that variation in English Language achievement, to some extent, is dependent

on the variability of whether the student is a boy or a girl. Results in Table 4.2B reveals that girls have a significantly higher mean score in this foreign language. It is interesting to find out that male students in Malaysia also possess similar attitudes to males from other parts of the world towards foreign languages. There are numerous studies in the UK which come out with similar findings to the present study indicating that boys are weaker than girls in foreign languages. Male Malaysian students are likely to avoid English Language whereas male British students also tend to reject foreign languages such as German and French. Powell (1979, 1984, 1986) voiced concern for a decade about the small numbers of boys gaining a foreign language qualification. Askew and Ross (1988) noted that in 1973 only 8 percent of boy sixth-formers in English LEA schools were taking A-level French compared to 24 percent of girls.

"Mother's qualification" contributes 1% to achievement variance, suggesting that variation in English Language achievement is somewhat dependent on whether mother is literate or illiterate. Ko (1985) found that Sarawak is still facing a high rate of illiteracy. According to him, in 1980, the break down of illiteracy by ethnic groups is as follows: Malay 38%, Melanau 48%, Ibans 65%, Bidayuh 55%, Chinese 26% and Others 55%. The break down of my samples also shows that 690 out of 925 students (or 74.6%) have

mothers with only a basic education (primary one to form three) and that 12 mothers never attained any formal education at all.

"Strategic approach" also contributes 1% to English language achievement variance, signifying that variation in this subject area is, to some extent, dependent on whether the student possesses a strategic approach to learning. Altogether, the predictor variables contribute 57.4% of achievement variance in English Language.

Malay Literature - achievement in Malay Literature has a significant negative correlation with "serialist style" of learning. This style is what Entwistle (1987b) refers to as 'relate evidence to conclusion, and examine the logical inter connections of the argument'. This negative correlation means that high achievers in Malay Literature are more likely to adopt a "serialist style" of learning. This "serialist style" is more appropriate for high achievement in Malay Literature because the subject area needs the students to 'relate evidence' and to 'examine the logical inter connections' of plots and sub-plots, characters, arguments and messages in a novel, play or poem.

Achievement in Malay Literature has a significant positive correlation with "intrinsic motivation", which

implies that high achievers in this subject area are likely not to be intrinsically motivated. In other words, students' high achievement in Malay Literature is not likely to be due to their own deep interest and excitement in learning the subject but because of external pressures like an examination requirement and government policy (Government of Malaysia, 1986) to rectify imbalance of 'skilled-man power' in both the arts (humanities) and sciences.

Fine Arts - students' achievement in Fine Arts has a significant negative correlation with "responsibility", which implies that high achievers in this subject area are likely to be more responsible than low achievers. High achievers tend to accept the consequences of their own actions and, thereby monitor their own behaviour more scrupulously than low achievers. In some schools, Fine Arts is treated as an unimportant subject area and teachers often use Fine Arts lessons for teaching other subject areas which they think are more important or simply use the time for revision. Five out of the eight schools in this study do not have a special room for Fine Arts lessons (due to lack of classroom) and most schools lack trained teachers to teach this subject area (see discussion in Chapter I). Since this subject area, to some extent, is taught under less than ideal conditions, much depends on individual responsibility as to whether to study the

subject area seriously or not. As "responsibility" falls under the moral domain (Kozeki,1985), the high achievers in this subject area are 'achievement-oriented who possess not only responsibility and interest in academic work but also doing it well'.

The stepwise multiple regression analyses provided in Table 4.7 show that "academic stream" is the best predictor, and it contributes over 12% of the achievement variance in Fine Arts. This indicates that achievement in Fine Arts is considerably dependent on whether the students come from an arts or a science stream. The findings in Table 4.2A suggest that science-stream students have a significantly higher mean score in Fine Arts than arts-stream students. This is rather interesting because usually Fine Arts is 'monopolised' by arts-stream students; indeed some schools do not offer Fine Arts for science-stream students. It may be conjectured that Fine Arts needs special aptitudes, skills and keenness rather than general cognitive abilities. It may be that science-stream students tend to be exposed to drawing of equipment, animals and other specimens in Biology, Chemistry and Physics. Thus, these demands may make them more skilful and, thereby, perform better in Fine Arts than arts-stream students.

The variable "sociability" provides more than 1% to achievement variance in Fine Arts, suggesting that it may

be of importance to have good relationships with others. Students good at Fine Arts may be interested in people and relate easily to others. Altogether, the student variables contribute only about 14% to the achievement variance in Fine Arts.

History - students' achievement in History has significant positive correlations with (a) a "surface approach" to learning, meaning that low achievers in History are likely to rely on "memorizing facts and possess a rote learning" possibly as a result of History having so many dates and events to study and remember; (b) "sociability", indicating that low achievers in History are more sociable than high achievers. Possibly low achievers who are 'too sociable' are likely to devote less time to studying; (c) "warmth", suggesting that low achievers in History possess a high degree of "warmth" (empathy from parents, warm relationships with teachers and peer groups). Kozeki (1985) classifies this type of student as "likely to be rather dependent, a passive follower who is likely to be seen as a conformist'; (d) "fear of failure", indicating that such a motive as 'worries about being behind with work or doing worse than others' may lead students to obtain poor achievement levels in History; (e) "interest", meaning that low achievement in History is significantly related to the amount of a student's "interest" in the subject area; and (f) "intrinsic motivation" which indicates that high

achievers in History are likely not to be intrinsically motivated in studying this subject area. In other words, they tend to be good at History because of external pressures rather caused by intrinsic motives or self-interest in the subject area.

As presented in Table 4.7, the best predictor variable contributing to student achievement in History is "optimism" which contributes more than 15% to achievement variance in this subject area. This implies that achievement in History is dependent on the degree of "optimism" which a student possesses. This is probably because students taking History are neither depressed nor pessimistic about historical events. This finding goes in parallel with students' comments in the Lancaster study (Ramsden, 1984: 156); though not exactly using the term "optimism", there are certain similarities to looking at History on the 'bright side' as

> Arts and social science [including History] tasks are seen to require interpretation, comparison, generalization, and to be more self-governed and easier.

> History, you can waffle, you can cover up your mistakes..no-one can either prove you right or wrong...you've got to take all things into account.

> They [science students] go about it more logical...you get this impression of the history student being airy-fairy and temperamental.... scientists deal in fact, while history students and artists deal in theory - we discuss theories and opinion.

Each of the variables "deep approach" to learning and "hope for success" contributes about 2% to achievement variance in History. This is probably because of the nature of this subject area which has a lot of analytical and critical tasks (e.g. historical events), and, thus, tends to require a fully understanding of the contents (deep approach). History is more subjective compared to science subject areas and, hence, is likely to require self-interpretation and the proposal of opinions. Thus, students' achievement in History, to some extent, depends on their possession of "hope for success" motivation. Overall, the student variables contribute over 18% of achievement variance in History.

Geography - the following student variables have significant positive correlations with achievement:(a) "fear of failure" , meaning that students' low achievement in this subject area is likely to be associated with fear of failure (worrying about being behind with work or doing worse than others). It seems that low achievers in Geography are likely to possess a lack of self-confidence. According to Birney *et al.* (1969) sometimes the "fear of failure" motive pushes some students study harder and leads to better achievement; and (b) "strategic approach" to learning, indicating that lack of "strategic approach" is significantly related to students' high achievement in Geography. Entwistle and Ramsden (1983), suggest that high

achievement is most likely to be associated with a "strategic approach" and a "deep approach" to form either a "meaning orientation" or an "achieving orientation", but the present finding is in contrast to this theory. What Meyer and Muller (1990) noted was that "meaning orientated student was more likely to perceive deep and strategic perceptions of learning context than a reproducing oriented [surface] student" (p. 47), is also rejected. The present finding shows that even high achievers in Geography possess lack of strategic approach to learning, and this is probably why students' achievement in Georgaphy is comparatively low in the SPM external examination, whereby, their mean score of 6.7 is hardly within the passing grade (see Table 4.0B and Figure 4A).

There are also significant negative correlations between students' achievement in Geography and the following student variables:

(a) "conscientiousness", meaning that high achievers in Geography are likely to be highly "conscientious". In other words, high achievers in Geography are likely to be those who are determined to carry out what is expected of them as well as possible. Cohn (1991: 253) noted that at this 'conscientious stage' students tend to follow rules

> ...because they are viewed as just, rather than because their violation leads to punishment or social disapproval. One's personality is regarded as more complex than at previous stages [impulsive, self-protective, conformistand self-aware]. Such objectives as *aggressive, materialistic, disorganized,*

and *optimistic* are applied to oneself and others, reflecting a greater awareness of emotional life.

Thus, conscientious students, who are likely to be more aware of their 'emotional life', e.g. self-esteem, may tend to be more determined to achieve better than others.

(b) "compliance", meaning that high achievement in Geography is associated significantly with a high degree of "compliance". Thus, high achievers in Geography are inclined to be compliant and according to Entwistle and Kozeki (1984), prefer the security of behaving according to defined rules, social norms and religious beliefs which give them satisfaction. Kozeki (1985) also noted that a "compliance" motive, which he categorises under the "moral domain", applies not only to academic work but also to doing it well and living up to what is expected.

(c) "deep approach" to learning, meaning that high achievers in Geography is associated significantly with such an approach to learning. This finding also supported the previous researches which associated a "deep approach" with high achievement (Marton and Saljo, 1984; Entwistle and Hounsell, 1975; Ramsden, 1984). This is probably because Geography and History (both arts subjects) are considerably alike and likely to require an analytical and

critical approach. Thus, a "deep approach" to learning is probably one of the most appropriate to tackle a task.

The best predictor for achievement in Geography is also "academic stream", contributing more than 26% towards achievement variance. This means that students' achievement in Geography is dependent on the actual academic stream (arts or science) in which a student is present. Again, science-stream students, as presented in Table 4.2A, have a significantly higher mean score than arts-stream students in this subject area. Yet geography is often considered as an arts subject. This greater success in geography may probably be because science-stream classes have smaller enrolments than arts-stream classes (see my sampling in Chapter III and Appendix 3A). In some schools, the ratio between science and arts students is 1:8. Due to lack of classrooms and inadequate school buildings, each arts-stream class sometimes has up to 48 students whereas in a science-stream class the number may be no more than 30 students due to limited space and equipment in the laboratories. Thus, these smaller enrolments are likely to provide better learning environments for the science-stream students.

The variable "instrumental motivation" provides an additional 7% to achievement variance in geography. This is probably because geography students, who study both

physical and human development, may tend to possess more of this 'external motive'. They may be able to foresee the importance of technical and social changes in Malaysia undergoing development and, thereby, be motivated to study the subject. According to Beebout (1972), leaders in developing countries see the school system as the primary agent to changing attitudes and values. Geography is probably a means through which social change may be attended. Adams (1965: 267) also cited that:

> ...while schools are not very effective in teaching attitudes, they may be able to teach students to respond in ways conducive to social development.

The variables "fear of failure", "conscientiousness" and "intrinsic motivation" each contributes only about 1% to achievement variance in Geography. Altogether the predictor variables contribute about 36% of achievement variance in Geography.

Physics - student achievement in Physics is significantly correlated with:

(a) "fear of failure", meaning that low achievement in Physics is significantly related to "fear of failure" which means that low achievers tend to anticipate the possibility of failure, worry about being behind with work and doing worse than others; this motive, as noted earlier, could possibly either lead them to work harder and eventually achieve better results, or to further disappointment and

pessimism. This is probably because learning tasks in Physics (as well as in other science subject areas) tend to be more hierarchical, logical, heterogeneous and objective, whereas in arts subjects students may employ self-interpretation and generalization. Thus, the nature of this subject area may tend to make students (particularly low achievers) more afraid of failure.

(b) "competence", suggesting that low achievers in Physics are likely to be those who are seeking knowledge and are self-confident. Teachers and parents tend simplistically to equate competence with performance and to assume that those with high achievement are competent and those with low achievement are incompetent. This statement is supported by numerous learning theories (Entwistle *et al.*,1974; Ball, 1977), but rejected by this finding. This is probably because low achievers tend to memorize equally well as the performers who understand more fully the laws, formulas and theories in Physics, but this would not, of course, show that low achievers are really competence in this subject area. They are probably rather 'competence' in memorizing.

(c) "hope for success", meaning that low achievers in Physics are likely to possess high "hope for success". Although they may be considerably weak in their perform-mance, low achievers may still tend to possess a strong

motive of "hope for success". They may not readily give up hope. Also, it is noted that the whole sample obtained a high "credit" average achievement in Physics (see Table 4.0B) which may indicate that even the poor achievers had considerable "hope for sucess".

The best predictor for students' achievement in Physics is "fear of failure", which contributes a very high percentage of 58.2% to achievement variance in this subject area. This means that a considerable proportion of variance in Physics achievement is dependent on the variation of students' degree of lack of self-confidence and worries about being behind with work and doing worse than others. It was noted earlier that the variable "fear of failure" is significantly correlated with low achieve-

The same finding occurs in other science-subject areas, which will be encountered later, such as Biology, Additional Mathematics and Chemistry whereby "fear of failure" contributes from 1% to 4% to their achievement variances. These results provide supportive evidence that students' achievement in science-subject areas such as Physics, Chemistry, Biology and Additional Mathematics, to some extent, are dependent on the level of their "fear of failure" which is, according to Biggs (1978), likely to be associated with a "reproducing orientation" leading to memorization. This is, as a whole, probably due to a

shortage of teachers (particularly science teachers) in Sarawak (MISS, 1988; Government of Malaysia, 1984), a lack of school facilities and over-crowded classroom enrolments (Arshat, 1986).

"Competence" (rewards from a recognition of developing knowledge and skills, reinforced by teachers) provides an additional 1.2% to achievement variance in Physics, making a total contribution from all student variables of 59.4% to achievement variance in Physics.

Biology - achievement in Biology has a significant positive correlation with "fear of failure", meaning that low achievement in Biology is significantly associated with "fear of failure". This is again probably due to the same reasons applying to achievement in Physics which we have discussed earlier.

A significant negative correlation is established between achievement in Biology and "serialist style" of learning, indicating that low achievers may not likely adopt a "serialist style" of learning. In other words, high achievers in Biology tend to rely on a "serialist style" of learning. According to Pask (1976a), a serialist student concentrates initially on facts but tends to miss important links between ideas or between subject areas. This is doubtless, to some extent, a weakness for these

students, but they still managed to achieve high performance in Biology probably because "serialist style" tends to go along with an emphasis on "memorization" (Schmeck, 1983).

The best predictor for achievement in Biology is "residency" in which over 8% of variance in its achievement is accounted for by this variable. This means that achievement in Biology is considerably dependent on whether the students come from an urban or rural area. As presented in Table 4.2D, urban students have significantly higher mean scores than rural students in Biology, which is again likely due to much more accessible educational facilities being available to urban students.

"Mother's qualification" contributes about 4% of achievement variance in Biology, indicating that variation in Biology achievement relies considerably on mothers' educational backgrounds. This is probably because more urban mothers are better educated than rural mothers (Ko, 1984; Noor Laily *et al.*, 1985), and thus could foresee the importance of studying science subjects, particularly Biology. This view fits in with government policy to upgrade the teaching of science and technology in schools and higher institutions in line with other national developments (Government of Malaysia, 1986).

Each of the predictor variables such as "fear of failure", "serialist style" and "competence" contributes slightly more than 1% to achievement variance. Altogether the predictor variables contribute only about 17% to achievement variance in Biology.

Chemistry - achievement in Chemistry has significant positive correlations with (a) "fear of failure", (b) "hope for success", (c) "compliance", (d) "intrinsic motivation", (e) "strategic approach", (f) "surface approach", and (g) "sociability". These correlations denote that low achievement in Chemistry is significantly associated with the two contradictory motives "fear of failure" and "hope for success". This means that some of the low achievers are likely to possess anxiety resulting from either "fear of failure" or too high aspirations associated with "hope for success" (or over-confidence), which either way may lead to poor achievement in Chemistry.

Low achievement in Chemistry is significantly related to "compliance", meaning that low achievers in this subject area are likely to behave rigidly according to defined rules or norms reinforced by their teachers or schools. Such rigidity may not be comfortable with a subject like Chemistry which requires flexibility in thinking and attitudes. Some students are likely to be too dependent on teachers and this attitude is what Rohana Zubir (1988)

refers to as a "spoon-feeding syndrome". On the other hand, some science teachers are too cautious and never let students do things on their own, afraid that they might damage equipment.

Low achievement in Chemistry is also significantly related to "intrinsic motivation", meaning that low achievers are likely to be interested in the subject matter itself and not because of the external pressures. It is a surprise that low achievers tend to be more intrinsically motivated than high achievers. This is probably because, according to Premack (1971), "reinforcement and punishment are...opposite sides of the same operation; the conditions which make one possible also make the other possible" (p. 149). Guzzo (1979) also noted that all behaviours are ultimately instrumental to internal consequences "therefore making it improper to say that an activity can be engaged for its own sake" (p. 83). Kadam Kiai (1990) noted a significant relationship between rural dwellers, big families and poverty, and high rate of school dropouts (Ahmad, 1981). Thus, "intrinsic motivation" in Chemistry may tend to be meaningless if the basic physiological needs such as those for survival, safety, and security as indicated in Maslow's motivational hierarchy (see Maslow, 1954), have not been fulfilled.

Low achievement in this subject area is also significantly associated with a "strategic approach" to learning. Strategic approach is associated with an achieving orientation (doing whatever is necessary to earn high grades). This is probably because no matter how hard a student might try to get things well-organised, if lack of qualified or trained science teachers (MISS, 1988) and shortage of equipment, the student may still tend to acheive poorly. Low achievement is also related to a "surface approach" to learning. Their possession of a "surface approach" to learning may lead to "reproducing orientation" (Entwistle, 1988), which suggest that low achievers in Chemistry are probably relying on memorization or rote learning.

"Sociability" is another variable which is significantly correlated with achievement in Chemistry. The positive correlation denotes that low achievers in this subject area is significantly related to "sociability", that is, they have good relationships, enjoy collaborative work and activities with peers. Adolescents are easily influenced by peers, according to Coleman and Hendry (1990). Peer pressure is a primary mechanism for transmitting group norms and maintaining loyalties among group members. If adolescents are "too sociable", especially in urban conditions, they tend to be more exposed to chances of committing anti-social behaviour

related to social problems like drug abuse, alcoholism, delinquency and school-dropouts. Malaysia is one of the developing countries facing a high rate of drug addiction among adolescence (Government of Malaysia, 1989). On the other hand, if students are "too sociable" in positive social behaviours like joining youth organizations, they may tend to be too busy with organizational activities and, thereby, neglect their academic study.

Achievement in Chemistry has a significant negative correlation with "serialist style" of learning, meaning that high achievers in this subject area are likely to possess a "serialist style" of learning. According to Entwistle and Kozeki (1985), a student relying on a "serialist style" is likely to concentrate initially on facts, details, and on the logical interconnections between 'bits' of knowledge or steps in an argument. He learns best when knowledge is presented formally with a clear structure but tends to miss important links between ideas or between subject areas. Thus, discussion between teachers and students may be necessary to relate present ideas with their past experience when dealing with "serialist style" students in attaining better achievement. It is probably better to clarify each component in Chemistry as only "part of a whole" (Ball, 1977) when components are interrelated and interdependent.

Again, "residency" is also one of the best predictors for achievement in Chemistry, contributing about 16% to achievement variance. This means that the greatest proportion of the variance is determined by whether the students come from an urban or rural area. Table 4.2D shows that urban students have a significantly higher mean score than rural students. The reason for this is that they are likely to have access to better educational facilities than rural students (Hirschman, 1972; Ahmad, 1981).

The variable "serialist style" of learning contributes 4% of variance in Chemistry achievement, showing that variation in achievement in this subject area is dependent on the extent to which students adopt a "serialist style" of learning. As mentioned earlier, "serialist style" of learning is a conspicuous variable associated with high achievement in Chemistry.

Each of the variables "fear of failure" and "strategic approach" to learning contributes about 3% to achievement variance in Chemistry. They tend to fear failure probably because Chemistry, like any other science, could be described as hierarchical, logical, heterogeneous, and rule-and procedure-governed (Ramsden, 1984). A Chemistry student, thereby, requires considerable experience in solving problems involving logical concepts and mathematical skills and these require ideal teaching which can only

be provided by trained and qualified teachers. But Sarawak, as noted earlier, is often lacking suitably qualified science teachers (MISS, 1988) and, therefore, has great difficulty in meeting these requirements. In some schools, according to Nazaruddin Mohd. Jali *et al.* (1986), there are shortage of laboratories and, thus, practical lessons are sometimes conducted in an ordinary classroom. These are probably salient factors in making Chemistry students have a fear of failure.

We have discussed earlier that low achievers in Chemistry are also significantly associated with a "strategic approach" to learning. Thus, it is not surprising that this predictor variable contributes about 3% to achievement variance in Chemistry.

The variable "mother's qualification" contributes 2% to achievement variance in Chemistry. As we have seen in Table 4.2D, urban students have a significantly higher mean score than rural students in Chemistry (and most of the other subject areas). Thus, urban mothers who tend to be more educated, once again may play an important role in promoting higher grades for their children in science-subject areas including Chemistry. Like in other Third World countries, parents whose upbringing was in rural areas, far from contact with books and industrial areas, probably have difficulty in understanding the importance of

education. The families in the kampung (villages) in rural areas are mostly within low-income groups and often have to struggle in agricultural occupations such as paddy-field farmers, pepper and sago planters and fisheries to earn a living. These families tend to need their children's labour to help them on the farm, particularly in the case of rice farmers during the paddy-field season. This leads to school absenteeism which may also cause low achievement.

"Competence" motivation is a less important predictor and contributes about 1% to achievement variance in Chemistry. All in all the predictor variables contribute about 25% of the variance in Chemistry achievement.

Additional Mathematics - achievement in this subject area correlates significantly with (a) "fear of failure", (b) "surface approach", (c) "hope for success" and (d) "instrumental motivation". These positive correlations indicate that high achievers in Additional Mathematics are likely to possess: (a) low "fear of failure", indicating that high achievers tend to be quite confident in this subject area; (b) to rely less on a "surface approach" to learning, meaning that high achievers are less likely to be dependent on rote learning or simply memorizing things by heart; (c) to have less "hope for success", showing that high achievers are less likely to be 'over-confident' and (d) to possess less "instrumental motivation", meaning

that high achievers are likely not to be influenced by external pressures or interested simply in qualifications and vocational opportunities. All the above findings fit considerably well within learning theories (see Marton and Saljo, 1984; Rogers, 1969; Ausubel *et al.* 1978) and achievement motivation theory (Atkinson, 1964). This is probably because high achievers tend to possess better cognitive abilities and therefore face less problems with Additional Mathematics which is a hierarchical and a 'straight-forward' subject dealing with formulae and problem-solving. These positive attitudes are important in learning and according to Carl Rogers (1969):

> ....significant learning is possible only when the individual has self-confidence in his ability to learn and feels that the experience of learning will be personally rewarding and meaningful (p.105).

Once again, the variable "residency" appears to be the best predictor of variance in Additional Mathematics achievement. Over 13% of the achievement variance is explained by whether a student resides in an urban or a rural area. Table 4.2D shows that achievement in Additional Mathematics is similar to other findings which are in favour of urban students. Again this result provides more salient evidence to support the explanation for the outcome that urban students are likely to have more exposure than rural students to modern educational facilities and well-

trained and highly qualified teachers in each specific subject area.

The variable "family size" contributes 9% to achievement variance in Additional Mathematics, suggesting that variation in achievement is dependent on whether a family is large or small. Previous research on ethnicity and fertility in Malaysia by Noor Laily Abu Bakar *et al.* (1985) supports the current findings. They found that educational attainment is highly negatively correlated with desired family size and fertility. In other words, low academic achievement is significantly associated with large family size. Large families are likely to be related to low socio-economic status, rural poverty and illiteracy. Rural poverty in Malaysia stands at 24.7% of the population as opposed to urban poverty of 8.2% (Heidi Munan, 1990). Child (1986) also found that family size correlates negatively with measured intelligence, which suggests that children who belong to large families tend to have lower IQs than those from smaller families. It could be possibly because, on one hand, children with several brothers or sisters have less opportunity for adult contact and therefore are restricted in their their warmth relationships and communicational exchanges. On the hand, large families may be the product of less intelligent parents, thus giving less intelligent children. Also, the smaller family may enjoy greater economic and educational

advantages and, thus, providing their children with better nutrition and education than larger families.

Illiteracy rate among ethnic groups in Sarawak in 1980 (Ko, 1984) are as follows: Malays 38%, Melanau 48%, Ibans 65%, Bidayuhs 55%, Chinese 26% and Other Indigenous 55%. According to Hong (1987), these indigenous or *Bumiputera* (sons of the soil) ethnic groups are in a majority in rural areas, whereas the Chinese, who are least illiterate, are urban dwellers. Additional Mathematics is a subject area that requires intelligence, skill, understanding and practice. Thus, the less educated parents or those who have large families, according to Child (1986), are hardly able to pay full attention to their children studying at home. Apart from that, noisy and crowded environments are not likely to lead to favourable conditions for studying mathematics or any other subject areas.

Each of the variables "fear of failure" and "surface approach" contributes 4% and 2%, respectively, to achievement variance of Additional Mathematics. "Fear of failure", as in other subject areas, is also likely to lead to students trying much harder and achieving good grades. Additional Mathematics, to some extent, is also dependent on the variability of students' level of "surface approach" to learning. Examinations are normally very restricted in their form, content and duration. This

means that very little of what has been studied and understood by students can be demonstrated in examinations. The volume of materials which students are expected to study is substantial and selection is therefore necessary. In Additional Mathematics, formulae and equations are among the contents which are likely to be memorized. According to Svensson (1984), there is the possibility that students tend to tackle the problem *"by selecting specific parts of the course material which they consider important and which, by themselves, are not daunting"*. In other words, this selection process constitutes a "surface approach" to learning. All in all the predictor variables explained 28.4% of Additional Mathematics achievement variance.

Modern Mathematics - achievement in Modern Mathematics has significant positive correlations with (a) "compliance"; (b) "fear of failure"; (c) "strategic approach"; and (d) "hope for success". These findings are similar to those in Chemistry, which we have discussed earlier. Again these results provide more salient evidence to support the explanation for the outcome that low achievers in this subject area are also likely to be compliant, fear failure, adopt a strategic approach to learning and possess hope for success.

In contrast, achievement in Modern Mathematics has significant negative correlations with (a) "sociability";

(b) "conscientiousness"; (c) "deep approach"; (d) "holist style"; and (e) "serialist style". The negative correlations denote that high achievers in Modern Mathematics are likely to possess more sociability, indicating that they are significantly more friendly and have good relationships with peers and teachers. They tend to be helpful with others in school work (Kozeki, 1985), and thus likely to give them good practice. Being sociable, the high achievers may not be reluctant to ask questions in class which may lead them to understand better. Such able students are likely to be more conscientious, in that they are likely to be more determined to carry out what is expected of them as well as possible. They, also, adopt a "deep approach" to learning, a "holist style" and a "serialist style" of learning. Their achievement in Modern Mathematics is associated significantly more with a "holist style" ($r = .119$; $p < .01$) than with a "deep approach" ($r = .085$; $p < .05$) and a "serialist style" ($r = .073$; $p < .05$). The findings seem to fit considerably well with those found by Entwistle and Ramsden (1983), whereby, a "deep approach" was associated with a "holist style" (the use of a broad focus in learning, making use of a wide variety of information, such as analogies and real-world experience) to form what they called a *"meaning orientation"*. Students seeking *meaning* are somewhat autonomous and independent of course syllabi (Schmeck, 1983). This is probably a salient factor for better achievement, particularly in Modern Mathematics.

The variable "academic stream" is the most important factor in predicting achievement in Modern Mathematics. Over 68% of variance in achievement in this subject area is explained by which stream (arts or science) a student is in. Table 4.2A shows that science students have a significantly higher mean score than arts students in Modern Mathematics. One of the reasons is probably because science students are at an advantage as they were also taking Advanced Mathematics; thus, Modern Mathematics which is more elementary is likely to be much easier for them. On the other hand, arts students who do not offer Additional Mathematics are likely to find difficulty in Modern Mathematics. About 6% (35 out of 593) of arts students dropped Modern Mathematics in the SPM external examination and more than 50% of the arts students who were taking Modern Mathematics considered it a difficult subject area and about 30% found it 'difficult and boring' (researcher interview).

Residential status "day scholar/boarder" contributes 1.3% to achievement variance in this subject area, indicating that a small fraction of students' achievement variance is dependent on whether the students live with their families at home or stay at school boarding houses (hostels). Table 4.2C shows that day scholars (who are likely to be urban students) have a significantly higher mean score than boarders in Modern Mathematics. Again, this

is probably because day scholars are able to go more freely to public libraries or attend tuition classes organised by such voluntary youth or professional organizations as the Sarawak National Youth Organization (SABERKAS), Sarawak Malay Association, Bidayuh Youth Club, Sarawak Dayak Youth Association and the Sarawak Teachers' Union. Some teachers and unemployed school-leavers also offer private tuition in their own houses to their neighbours' children. Thus, day scholars are likely to enjoy more accessible educational tuition apart from what they study at school than boarders. Boarders, on the other hand, are left to study on their own at certain private night-study times allocated in school regulations; to get assistance from teachers regarding school work is likely to be impossible after office hours.

Each of the variables "mother's qualification", "fear of failure", "warmth" and "compliance" contributes less than 1% to achievement variance in Modern Mathematics. This means that, to some extent, students' achievement in Modern Mathematics are also dependent on their mother's educational background, fear of failure and compliance as in a few other subject areas which we discussed earlier. It seems that achievement in Modern Mathematics is likely to be linked with "warmth", meaning that students with high achievement in this subject area tend to have good relationships with parents, and, thereby, obtaining

encouragement and interest from them. Thus, educated mothers are more likely to foresee the importance of good family relationships, paying attention, showing interest and giving encouragement in their children's academic study. Altogether, the predictor variables contribute 71.5% to achievement variance in Modern Mathematics.

Human Biology - achievement in Human Biology has significant negative correlations with "conscientiousness" and "surface approach" to learning, denoting that high achievers are likely to be more conscientious and to adopt a surface approach to learning. According to Entwistle and Ramsden (1983), "strategic approach" indicated a use of both "deep" and "surface" approaches, and if supported by a competitive form of motivation "hope for success" combined with "instrumental motivation" will form an "achieving orientation". On this basis, we could consider the use of "surface approach" combined with "conscientiousness" (determination to carry out what is expected of them as well as possible) will also form an "achieving orientation". In other words, students rely on rote learning if they have high determination and hope to achieve high grades in Human Biology.

Student's residential status "day scholar/boarder" is also the best predictor, contributing 7.5% to achievement variance in Human Biology. "Day scholars", as shown in

Table 4.2C, obtained a significantly higher mean score than "boarders" in Human Biology. This provides strong evidence that achievement variance in most subject areas including Human Biology, to some extent, is dependent on students' residential status for the reasons mentioned earlier (see in English Language).

"Family size", whether a student comes from a small or large family, provides an additional 2% of the variance for Human Biology achievement. Here again, a large family is likely to be associated with a student's low achievement. To support my arguments, the break down of my sample shows that 16.1% of the rural students have 10 or more people per family in contrast to only 5.2% urban students with this number per family; and only 6.4% of rural students, as compared to 18.9% of urban student have brothers or sisters studying up to university (degree) level (see Appendix 2A). All in all the predictor variables explain only somewhat more than 9% of achievement variance in Human Biology.

Arabic Language - achievement in Arabic Language correlates significantly negatively with "warmth", suggesting that low achieving students in this subject area tend to possess less warmth. They are likely to receive little encouragement and interest actively shown by parents. Although Muslim parents can read and write in

the Arabic Language, as their everyday Islamic prayers and the Holy Quran are in the Arabic language, not all can fully understand the language. This group of people can only understand Islam through Islamic scholars, ustaz (Islamic teachers), religious assemblies, religious talks and translated references. Thus, these parents, who are incapable of understanding the Arabic Language themselves may also be unlikely to give sufficient help and encouragement and to show to the children their direct interest in this subject area. Two other variables giving negative correlations are "strategic approach" to learning and "serialist style" of learning, indicating that low achievers in Arabic Language tend to possess neither a strategic approach to learning nor a serialist style of learning. According to Richardson *et al.* (1987), styles and approaches to learning are highly context-dependent. They vary for the same student between different tasks and are functionally related to students' perceptions of teaching and assessment (Ramsden 1984; Laurillard 1984). Thus, high achievers are likely to possess both a "strategic approach" to learning (students intend to get the best grades possible by being well-organized and making effective use of time) and a "serialist style" of learning (students concentrate initially on facts, details, and on the logical interconnections between 'bits' of knowledge; learn best when knowledge is presented formally with a clear structure and tend to miss important links between

ideas or between subject areas). This is probably true in the case of Arabic Language where high achievers are likely to be strategic students and at the same time possess a narrow, cautious point of view relying on evidence and logical analysis to adopt what Entwistle and Ramsden (1983) called an "achieving orientation" and "reproducing orientation". Another variable giving negative correlation is "conscientiousness", suggesting that low achieving students are likely to be less conscientious than high achieving students in Arabic Language. This shows that conscientiousness is important in leading students to high achievement in Arabic Language.

In contrast, Arabic Language achievement has a significant positive correlation with "compliance". This implies that low achievers in this subject area are significantly associated with a high degree of compliance. In other words, low achievers in Arabic Language are likely to accept school norms and reward-structures, to possess high morality, personal and social responsiveness. Altogether there were 120 students taking the examination in Arabic Language, all from one particular school - **Sekolah Menengah Kerajaan Sheikh Haji Othman Abdul Wahab, Matang** (Sheikh Haji Othman Abdul Wahab Government Secondary School, Matang). Out of 120 students (see also Table 4.0B), 96 students (80%) obtained a failed grade of 9 units.

Entwistle and Kozeki (1988) point out that rewards offered by adults can be classified in terms of three main domains - *affective domain, cognitive domain, and moral domain.* In *affective domain*, adults may use emotional rewards of showing interest, concern, and love. In *cognitive domain*, they may emphasize rewards related to the development of intellectual competence. They may, however, base their rewards on behaviour which follows arbitrarily imposed rules, approved moral precepts, or accepted social conventions as in the *moral domain*. Since "compliance" falls under the moral domain, these students who possess high "compliance" are likely to lack independence (see Kozeki's model in Chapter II). As students' achievement in Arabic Language is very low, there is the possibility that the 'defined rules and norms' in the school may tend to be inadequate. Ahmad (1981) noted that children have to wake up as early as 4 o'clock in the morning to be in time for school which starts at 7.30 a.m. and he suggested that schools hours should be made more flexible. In some boarding schools where dining halls are small, students take their meals in shifts and, thus, breakfast can be as early as 5 o'clock in the morning. One of the reasons for starting school so early is to enable it to close at about lunch time, around 1 p.m. and at the same time enable the school, which has two sessions, to start the afternoon session. Apart from that, students take it in turn, class by class, to undertake "community work"

whereby the morning-session students come to school in the afternoon and afternoon-session students in the morning for general cleaning, e.g. cutting grass, sweeping and cleaning toilets. These rules and norms, on one hand may be good training for independence, responsibility and hard-work, but on the other hand may they interrupt their studies. One of the problems may be a lack of experience of unqualified teachers because according to Simanjuntak (1981), teaching approaches and techniques are important and teachers should be able to decide when to use, for example, OPTA (Original Pragmatic Transcording Approach) - suitable for the teaching of first language, and APTA (Artificial Pragmatic Transcording Approach) particularly for second language like Arabic Language and English Language as in the case of Malaysian students.

Residential status "day scholar/boarder" also proves to be the best predictor, contributing 79.5% to achievement variance in Arabic Language. Results from Table 4.2C revealed that day scholars have a significantly higher mean score than boarders in Arabic Language.The school with the majority of Arab language students, **S.M.K. Sheikh Haji Othman Abdul Wahab, Matang**, has almost all boarders. Thus, the very small fraction of the students, who are day scholars, tend to be high achieving students because they are likely to obtain private tuition apart from formal lessons provided by the school.

The variable "instrumental motivation" (interested in qualifications only or motivated because of external pressures) contributes 4% to achievement variance in Arabic Language. In other words, students taking this subject are likely to possess vocational or instrumental motivation, to get as high grades as possible in Arabic Language so that they can continue their studies in the **Universiti Islam Antarabangsa Malaysia** (Islamic International University of Malaysia), Islamic College or other national or international Islamic organizations. As a result of the extension of the Education Act 1961 (see Chapter I) to Sarawak in 1976, the teaching of the Islamic religion in schools, both primary and secondary, has been further increased (MISS, 1988). Thus, the Arabic Language goes hand in hand with the teaching of the Islamic religion. At the end of 1987 638 religious teachers from Peninsular Malaysia were sent to Sarawak to teach the Islamic religions in various primary and secondary schools throughout the state. This figure is far from adequate (researcher interwiew with the Principal of SMK Sheikh Haji Othman Abdul wahab, Matang). Apart from the initial role of the school to produce candidates for religious teaching, the school now envisages the tapping of knowledge and skills available in the Middle East. Thus, it is important to equip successful students with Arabic Language, a *lingua franca* of about a fifth of the world's population.

The variable "strategic approach" to learning contributes 3% to achievement variance, showing that variation in this subject area is dependent on students' degree of a "strategic approach" to learning. Thus, a "strategic approach" (the use of both a "deep" and a "surface" approach) supported by an "instrumental motivation", as in the case of Arabic Language, will provide a salient and promising factor for achievement which, according to Entwistle and Ramsden (1983), will form an "achieving orientation". Altogether the predictor variables contribute 85.9% to Arabic Language achievement variance.

Chinese Language - students' achievement in this subject area has significant positive correlations with: (a) "intrinsic motivation"; and (b) "fear of failure", denoting that low achievers in Chinese Language possess intrinsic motivation and fear of failure. In other words, they tend to be good in the Chinese Language because of external pressures rather than caused by intrinsic motives or self-interest in the subject area. As expected, their possession of "fear of failure" may lead the students to obtain a poor achievement level in the Chinese Language.

Significant negative correlations are also found between students' achievement in Chinese Language and (a) "conscientiousness"; (b) "hope for success" and (c)

"serialist style" of learning. These negative correlations indicate that low achievers in Chinese Language are likely to possess less conscientiousness, less hope for success and rely less on a serialist style of learning. These results are interesting because it is not only in Chinese Language that low achievers are significantly associated with less conscientiousness and lack of hope for success, but in all language subject areas like Bahasa Malaysia (Malay Language), English Language and Arabic Language. Except in Bahasa Malaysia, low achievement in English Language, Arabic Language and Chinese Language is significantly related to little reliance on a serialist style of learning. In other words, high achievers in all language subject areas are likely to be more conscientious (determined to carry out what is expected of them as well as possible) and have more hope for success. A high achieving student in the Chinese Language tends to adopt a serialist style of learning. He learns best when knowledge is presented formally with a clear structure but tends to miss important links between ideas or between subject areas (Kozeki, 1985). These findings suggested that high achievement in English, Arabic and Chinese as students' second languages are likely to be related to a "serialist style" of learning probably because these languages are likely not to be their mother-tongue. Thus, they may require lessons 'to be presented formally with a clear structure'. The current finding also suggests that a

"serialist style" of learning does not correlate with achievement in Bahasa Malaysia, which is the students' first language. It seems that a serialist style of learning is more related to students' second languages and not to the first language (Bahasa Malaysia), which is also the official and national language of Malaysia. This is probably because in their own language students tend to be more efficient, and thus, to rely less on details and to be able to link important ideas more efficiently.

The best predictor of Chinese Language achievement is "academic stream", which contributes 14% to achievement variance in this subject area. Results in Table 4.2A shows that science-stream students have a significantly higher mean score in Chinese Language than arts-stream students, suggesting that high achievement is more dependent on being in a science-stream rather than an arts-stream.

The variable "residency - urban/rural" predicts 5.6% of achievement variance in Chinese Language. From the sample, only Chinese students study the Chinese Language. The Chinese (migrant people) are mostly urban dwellers (see Chapter I and MISS, 1988). Thus, higher achievement in this subject area is obtained by urban dwellers (t-analyses in Table 4.2D), probably because they have more access to educational facilities in the urban areas.

Each of the variables "intrinsic motivation" and "conscientiousness" contributes 3.8% and 2.7% to achievement variance, respectively. These results indicate that students' achievement in this subject area, to some extent, is dependent on their degree of being motivated by an interest in the subject matter itself and their determination to carry out what is expected of them as well as possible. The variable "conscientiousness" (highly determined to carry out what is expected of them as well as possible) is another salient factor determining achievement in Chinese Language. Apart from educational facilities being more accessible to the essentially urban Chinese than for the essentially rural indigenous ethnic groups, according to Hirschman (1972), their possession of high intrinsic motivation and conscientious attitudes are probably one of the reasons why Chinese students continue to perform better than the **Bumiputera** (princely sons of the soil) or indigenous ethnic groups (Ministry of Education, 1985). The supporting evidence provided in Table 3.4 (see Chapter III) shows that Chinese students achieved the highest percentage of overall SPM results in Grade I (93.3%) and 6.7% in Grades II and III compared with the **Bumiputera** ethnic groups, especially Malay students who achieved the lowest - only 27.3% in Grade I and 72.7% in Grades II and III (low achievers).All in all, the student variables contribute over 26% to Chinese Language achievement variance.

Commerce - students' achievement in this subject area correlates significantly with: (a) "hope for success"; (b) "fear of failure"; (c) "strategic approach"; and (d) "sociability". These positive correlations indicate that low achievement in Commerce is significantly associated with the two contradictory motives "hope for success" and "fear of failure". This means that some of the low achievers are likely to possess anxiety resulting from either too high aspirations associated with "hope for success" or "fear of failure". Low achievement in Commerce is also significantly related to a "strategic approach" to learning and "sociability", suggesting that low achievers 'do try to organize time and distribute effort to obtain highest possible grades' and probably because they are "too sociable" and may tend to be too busy with outside-school activities they may neglect their academic study which leads to poor achievement.

Liz Taylor (1983) has shown the importance of what she called *educational orientations*. These orientations describe distinctive sets of values, motives and attitudes relating to an educational course, which can be used to explain a student's subsequent behaviour. According to Entwistle (1988: 75),

> Students differ in their orientations to education and have implicit study contrasts against which they judge their success. In schools these contrasts become part of an academic self-concept which is strongly

influence by family and peer group and which in turn influences classroom behaviour and learning.

Turning back to the current findings and associating them with Entwistle's and Ramsden's (1983) educational orientation model, low achievers in Commerce who rely on "strategic approach" to learning and supported by "hope for success" (a competitive form of motivation) are grouped under an *achieving orientation* (doing whatever is necessary to earn high grades). Although low achievers may possess high "fear of failure" which tends to be in a *reproducing orientation* leading to memorization (Entwistle and Ramsden, 1983), it is likely to be overshadowed by an *achieving orientation. Thus, their mean score of 5.61 in Commerce is quite high compared with other subjects as this mean still falls within a credit pass (see Table 4.0B and Figure 4A, earlier in this chapter).*

The variable "residency - urban/rural" is the best predictor, contributing 24% to achievement variance in Commerce. The results in Table 4.2D show that urban students have a significantly higher mean score than rural students in Commerce. Thus, it provides supporting evidence of the importance of being an urban student as the achievement variance in most subject areas is dependent on this vital factor.

Each of the variables "hope for success" and "interest" contributes 7.7% and 3.4%, respectively, to Commerce achievement variance. "Hope for success" when combined with "interest" is likely to form what Entwistle and Ramsden (1983) called an "achieving orientation". Correlation results (see Table 4.2D) show that low achievement in this subject is significantly related to the possession of high hope for success. Thus, low achievers in Commerce are more likely to be those who possess an achievement orientation, suggesting that although their achievement may be considerably weak in this subject, with their high hope for success, they may be determined to keep on trying to achieve better or to do well next time. In other words, the low achievers are unlikely to give up hope or lose self-confidence. As a whole, predictor variables contribute 35% to students' achievement variance in Commerce.

General Science - achievement in this subject correlates negatively with a "strategic approach" to learning, which signifies that high achievers are likely to adopt a "strategic approach" which indicates the use of both deep and surface approaches (see Entwistle and Ramsden, 1983), with the intention to get the best grades possible by being well-organized. Thus, it may not be surprising that they achieve considerably high score in General Science, as shown in Table 4.0B and Figure 4A.

Ridzuan (1985), examined the Primary Six and Form One students' competence in science vocabularies (terminologies) because the students in Sarawak, by then, were still in a 'transitional period' of switching from English to Bahasa Malaysia medium, thus facing problems in new Bahasa Malaysia terminologies. He found that students who have significantly low mean scores in this test have a significant positive correlation with their achievement in General Science as measured by end-of-term examination ($r = .33$; $p < .01$). In other words, although the students tend to be achieving low in a 'terminology test', yet they are achieving high marks in General Science. Thus, Ridzuan (1985) suggested that these students are likely to be relying on rote learning (or a "surface approach" in Entwistle's term), which does not support the present finding. This is probably because "their approaches vary to some extent from task to task" (Entwistle, 1987a :61) and may also vary from primary and junior secondary to high school.

The best predictor also appears to be a "strategic approach" to learning which contributes 2.9% to achievement variance in General Science. This means that achievement in General Science is dependent on the extent to which a student is "well-organized, making effective use of time and seeking out appropriate working conditions to earn the best grades possible", a salient factor for achievement in

this subject which supports the previous correlational results associating high achievers with this particular approach to learning.

The variable "hope for success" which contributes 2.6% to achievement variance in General Science, is more evidence of the possibility that high achievers are likely to possess "achieving orientation" as this competitive motivation (hope for success) goes together with a "strategic approach" to learning as described in Entwistle's and Ramsden's (1983) learning theory. According to Entwistle et al.(1979), the achieving student is extrinsically motivated by a hope for success and is said to be "stable, self-confident, and ruthless". Altogether the predictor variables only explained 5.5% of the achievement variance in General Science.

Principles of Accountancy - achievement in this subject has significant negative correlations with: (a) "warmth", suggesting that low achievers in this subject area are likely to possess less warmth and empathy from parents as well as less warm relationships with teachers and peer groups. During the early stages of child-rearing the friendly relationship with the parents, and later with the teachers and peer groups, should establish a strong, fundamental and continuing motivation of "warmth", of caring, and of loving sentiments. In Maslow's (1954) human

hierarchical needs, he also noted the importance of 'love and belonging: affiliation and affection' which is quite similar to Kozeki's "warmth". According to Child (1986), psychotherapy places great faith in the influence of thwarted love needs on the conscious life. Thus, lack of "warmth" tend to make children insecure and may lead to low achievement; (b) "sociability", indicating that low achievers are likely to be less sociable. Being unsociable, low achievers are likely to lack participation in class and group discussions, which may lead them to achieve less well in this subject; (c) "competence", showing that low achievers in this subject are likely to lack competence, that is, gaining no reward from a recognition of developing knowledge and skills. Motivation never acts in a vacuum, but is always acting on and being acted on by both learning and perception. Sprinthall and Sprinthall (1981) noted that various researches have also found that a student's personal feeling of self-directed competence was the most important factor in determining academic achievement. In Sprinthall's and Sprinthall's (1981: 330) own words:

> Competence was discovered to be more important than a whole host of seemingly crucial variables, including social-class differences, race, pupil-teacher ratios, and even the educational background of teachers. Academic achievement depended most heavily on the student's personal conviction of being in charge of his or her own fate.

(d) "responsibility", meaning that low achievers are likely not to accept the consequences of their own actions and

monitoring their behaviour accordingly. In other words, low achievers tend not to accept responsibility for their own failure (weaknesses) and likely to be what Ahmad (1981) called 'regular school absenteeism"; (e) "compliance", indicating that low achievers are likely to possess less compliance to responsible demands, and react unfavourably to the security of behaving according to defined rules or norms. Such student's attitudes seem to lead to poor levels of performance, and probably worse, may lead to juvenile delinquency, drink and drugs (Coleman and Hendry (1990), and according to Mohamed (1989), about 48.4% out of 314 Malaysian adolescents (ages 10-20) in his study took dangerous drugs such as cannabis, heroin and morphine; (f) "instrumental motivation", suggesting that low achievers are also likely to lack instrumental motivation. In other words, low achievers tend not to foresee the vocational and economic importance of this subject area in today's competitive business world. This is also probably true because only a very small proportion of the sample in this study (15 out of whole 925, or 15 out of 593 arts-stream students) showed interest by studying Principles of Accountancy, possibly because they could not foresee its importance; (g) "conscientiousness", meaning that low achievers are less determined to carry out what is expected of them as well as possible. As expected, all these correlational results provide supporting evidence to the school motivational theory suggested by Entwistle and

Kozeki (1985) which we have discussed in Chapter II.

The best predictor variable for Principles of Accountancy is "holistic style", which contributes over 55% to its achievement variance. "Compliance" (preferring the security of behaving according to defined rules or norms) contributes about 14% to achievement variance in this subject area. These results mean that variation in achievement in Principles of Accountancy is dependent on the extent to which students adopt a "holist style" of learning and their possession of "compliance". As noted earlier (see Entwistle and Ramsden 1983 and Pask 1988), a "holist style" is associated with a "deep approach" to learning, thus, leading to a "meaning orientation" (search for personal understanding). "Compliance" falls under "moral domain" and according to Kozeki (1985: 196):

> ...overemphasis on the moral domain might lead to apathetic compliance in some cases or in others a form of fanaticism (believing absolutely in a particular code of conduct and trying to impose it on others).

Students should be more independent and understand the contents (rules or norms) of the subject area and not to rely too much on excessive formality in teacher's teaching because this could be expected to encourage excessive passivity and unresponsiveness leading to failure. Altogether the predictor variables contribute more than 69% to achievement variance in Principles of Accountancy.

Relationships of students' optimistic view of academic study to their learning approaches, learning styles and school motivation

Two distinct patterns of relationships can be seen in Table 4.4 and Figure 4C. The first three school motivation sub-scales, namely, "intrinsic motivation", "conscientiousness", and "hope for success", show strong positive relationships with students' optimism. These positive correlations indicate that optimists are likely to possess an interest in the subject matter itself, to carry out what is expected of them as well as possible, and to compete strongly so as to do better than others as well as maintaining a high level of self-esteem. Thus, optimists are likely to be more confident and to have less doubt and fear of failure. In the second group, consisting of the learning approaches and styles, students' optimism correlated significantly with a "holist style" of learning (the use of a broad focus in learning and making use of a wide variety of information such as analogies and real-world experience) and a "deep approach" to learning (student intends to understand and make active attempts to relate new ideas to previous knowledge or real life experience, and to adopt an independent and critical stance towards knowledge). The existence of "intrinsic motivation", "holist style" and "deep approach" to learning, when combined together (see Entwistle and Ramsden, 1983),

suggest that optimistic students are likely to possess a "meaning orientation" (search for personal understanding).

The results here parallel the optimism versus pessimism theoretical view point provided by Carver and Scheier (1985, 1988). Optimists, who have favourable expectancies tend to be more intrinsically motivated and to possess more hope for success. Thus, they are likely to continue to focus on task efforts. Optimists have no fear of failure, are less stressed or anxious, and even if they do, they are people who expect good outcomes and keep trying "*...provided they have favourable expectancies*" (Carver and Scheier, 1988:328). In times of difficulty optimists appear to have better outcomes - both behavioural and affective - than do pessimists. According to Carver and Scheier (1988), these optimists (1) adopted an active, problem focused coping style, aimed at resolving the difficulties that they are encountering and (2) tended to suppress activities that are competing for their attention in order to concentrate more on a particular problem at hand.

Although optimism versus pessimism is not entirely the same as succeeding versus failing an examination, there are certain similarities. The results of the present study, also, support previous observations (Carver and Scheier, 1988; Scheier *et al.* 1986) that optimism was associated

with evidence of an active interest in subject matter, being competitive and determined to carry out what is expected of them as well as possible and relying on meaning orientation (in search for personal understanding). The *t*-test results in Table 5.1 show these trends and, also, suggest that optimist students are likely to possess more of these school motivation variables as they have significantly higher mean scores than pessimist students in "sociability", "competence", "interest", "responsibility", "compliance", "intrinsic motivation", "hope for success" and "conscientiousness". In contrast, as predicted, pessimist students tend to possess more "fear of failure" (means= 22.37 for pessimist, 21.10 for optimist; t= 2.94; $p<.01$), which fits in with those of the previous studies.

Thus, these factors combined with "favourable expectancies" are good motives for success. On the other hand, pessimism is likely to be associated with a tendency to give up and disengage from goals, a fear of failure, lack of motivation and the adoption of rote learning or an over-dependence on "spoon feeding" (see Rohana Zubir, 1988). Thus, these negative feelings together with stress, anxiety and family financial problems may lead to early school withdrawal (see Ahmad, 1981) and to be a recipe for failure.

Differences in achievement between students who possess "internal" locus of control and those who possess "external" locus of control in different subject areas.

The *t*-test results in Table 4.5B indicate that there are no significant mean differences in achievement between "internal" and "external" locus of control groups of students in all subject areas. The present findings indicate that the claim that one ought to possess an "internal" locus of control in order to obtain a high achievement level (Lao 1970, Fanelli 1972, Messer 1972, Bar-Tal and Bar-Zohar 1977, Stipek 1981, and Maznah Ismail and Foong 1984) is not supported. This is probably because the previous studies were based on primary school pupils (from third to fifth grades), whereas the sample in this present study are high school students or adolescents aged around seventeen years. At this stage, adolescence is usually thought to be a time of both change and consolidation. Apart from major physical changes, they will face changes in emotion, intellectual growth, more complex and sophisticated self-images (the individual's description of the self) and self-esteem (the individual's evaluation of the self). Harter (1983) delineated four dimensions underlying global self-esteem:

1. Competence (cognitive, social and physical sub-areas), or success in meeting achievement demands.

2. Social acceptance (including peers and adults), or attention, worthiness, and positive reinforcement received from significant others.
3. Control, or feeling of internal responsibility for outcomes.
4. Virtue, or adherence to moral and ethnical standards.

As children develop, the strong bond with parents (Kozeki's affective domain) is challenged by an increasing demand for autonomy and independence which comes from cognitive and practical accomplishments (cognitive domain). Apart from these two domains of motivation which can be seen as mapping out the external sources of reinforcement, adolescents also need a moral domain, an internal source of reinforcement, where they can possibly judge their behaviour in terms of their own internalized standards of what is accepted. Control, Harter (1983) suggested should include not only 'feeling of internal responsibility' but also 'feeling of external responsibility' for outcomes because "compliance" (conformity)" in Kozeki's moral domain reflects the controlling influence of the acceptance of religious beliefs where reinforcement is perceived as fate from God or powerful others ("external" control). Young pupils at primary-school level are likely to rely solely on "internal" locus of control (perceive that their achievement is contingent upon their own abilities). As

they grow up, they tend to rely on both "internal" and "external" locus of control (the latter perceived as the result of luck, fate, chance, external pressures and to be under the control of powerful others). External pressures, for example, can be split further into situational specific categories such as poor socio-economic status (SES), parents' or adult pressures (too demanding of students' success), and social or cultural norms where higher education is meant for male only. Carver and Scheier (1987: 201) noted that,

> ...locus of control (causality) is not necessarily an important determinant of outcome expectancies. In order to adequately measure generalized expectancies for favourable or unfavourable outcomes, one must measure these expectancies per se. Locus of control is simply not a suitable proxy.

There are numerous predictor variables such as students' IQ, cognitive abilities, personalities, school motivation, learning environments, learning approaches or styles which may contribute more effectively to students' achievement variance rather than locus of control. Thus, students' academic achievement at the adolescence stage are likely to be less dependent on either "external" or "internal" locus of control. The results from the present research support this contention.

The contributions to student achievement in the Sijil Pelajaran Malaysia (Malaysian Certificate of Examination) external examination in Malaysia of student variables gender, residency (urban/rural), residential status (boarder/day scholar), learning approaches and styles, locus of control,school motivation and optimism-pessimism view.

"Academic stream" is the best predictor which contributes more than 20 percent to achievement variance in the whole SPM external examination. This indicates that academic stream in which a student is placed, has significant effects on achievement. The *t*-test results in Table 4.6B show that the students in the science stream have a significantly higher mean score than those in the arts stream in the whole of the public examination. It is not surprising that achievement in the SPM is higher for science-stream students because they were 'selected' students who had obtained good results in the **Sijil Rendah Pelajaran** (Lower Certificate of Education) external examination before spliting into streams (arts and science) on entering Form IV. In addition, it has been Malaysian educational policy since 1968 to improve science education offered in schools so as to build of a progressive society orientated towards modern science and technology. There is also an increasing awareness of the need for more people with scientific training and critical attitudes towards science and science activities to meet national manpower demands in the fields of science and technology. As such, science-stream students tend to

receive better facilities, more trained and qualified teachers and smaller class enrolment than arts-stream students. Thus, it is not surprising that academic stream is the best predictor variable contributing to achievement variance in the SPM.

The variable "father's qualification" contributes about 5 percent to achievement variance in the SPM, which indicates that a significant percentage of the variation in students' achievement is determined by whether or not their fathers are educated or literate. Father, as the head of a family, plays an important role in providing education to his children. Thus, educated fathers are likely to realize the importance of education and of sending their children to school. According to Ko (1984), about 53 percent or half of the population in Sarawak in 1980, were literate. Some fathers needed their children to labour in such daily occupations as working in the paddy fields, pepper gardens, rubber and coconut plantations, fishing or helping in the family business. This leads them to perform less well in external examinations and, in some cases, students become early school dropouts.

"Hope for success" contributes about 4 percent of achievement variance in the SPM. This result indicates that variation in achievement is to some extent dependent on the degree of hope for success (competitive, determined to

do better than others so as to maintain a high level of self-esteem). Thus, being competitive, determined and self-confident, which are characteristics motivated by "hope for success", are salient factors leading to success in the SPM.

"Fear of failure" (anxiously aware of assessment requirements; lack of self-confidence) contributes about 2 percent to achievement variance in SPM. Thus both variables, "hope for success" and "fear of failure" affect achievement. Kozeki (1985) refers to these students as diligent, very reliable and likely to be rather dependent, passive followers who are seen as conformists. Students who fear failure (who anticipate punishment or failure) are likely to study hard, to be not over-confident and, thus, to be more successful.

The variables "sociability", "compliance" and "residency" each contributes 1 percent or more to achievement variance. Figure 5A reveals the Pearson's product-moment correlations between academic achievement and "hope for success", "fear of failure", "sociability" and "compliance". These significant positive correlations indicate that high achievers possess lack of hope for success, little fear of failure, poor sociability and less compliance. It is a surprise that high achievers tend to possess poor sociability because sometimes it is rather

important to be more sociable, enjoy collaborative work and activities with peers and acceptance at school. They could possibly work together, having group discussions and exchange views on their school work.

With regard to "compliance" (preferring the security of behaving according to defined rules or norms) it is very important to be well-disciplined, obedient to school rules and regulations (Kozeki, 1985). The results of the present study do not support these trends (see Table 4.6A). According to Coleman and Hendry (1990), adolescents tend to be influenced easily by delinquents and juvenile gangs who may engage in drink, sex, gambling and drug addiction. Mohamed (1989) cited that from 1983 to 1986 there were 825 drug addicts in Malaysia and about 49 percent of them were of school age (10-17 years old). Thus, lack of "compliance" may lead to poor achievement and, to some extent, may lead to some of these adolescent problems.

"Residency", also, contributes a significant percentage to achievement variance. Results in Table 4.2D show that urban students have a significantly higher mean score than rural students in most subject areas. It is noted that achievement in the SPM is generally higher for urban students. This is probably because there are more educational facilities in an urban area, in this case Kuching City, than in a rural one. Thus, achievement in

the SPM is somewhat dependent on whether the students come from an urban or a rural area. The least important predictor variable, which each contribute less than 1 percent to SPM achievement variance are "warmth", "mother's qualification", "family size", "serialist style" of learning, "competence", and "strategic approach" to learning. Altogether the predictor variables contributes 36.5 percent of achievement variance as measured by the Sijil Pelajaran Malaysia (SPM) external examination.

Differences in the contribution of school motivation, learning approaches and styles, locus of control and optimism to achievement within different ethnic groups.

The results of stepwise regression analyses in assessing the contribution of predictor variables to SPM achievement (based on six best subject areas, see Chapter III), within different ethnic groups, are presented in Table 4.8. Some of these features, from the results in Table 4.8, merit comment.

a. *Malay*

"Responsibility" (students' accepting responsibility for own action) is the best predictor which contributes over 12 percent of variance in Malay students' achievement. This means that variation in Malay students' achievement is dependent on the extent to which they accept

"responsibility". According to Rogers (1969), the "unconditional regard" (over-emphasis on control and punishment) may lead to irresponsibility among the students. Thus, to develop personal responsibility, it seems essential that students are given clear indications of the behavioural limits beyond which disapproval or punishment would be the justifiable outcome. Kozeki (1985) classifies "responsibility" under the moral domain where rewards are derived from personal and social responsiveness. Students develop and enjoy personal responsibility and judge their behaviour in terms of their own internalized standards of what is acceptable. Thus, if a student is emotionally dependent, according to Kozeki (1985), it would make sense to encourage "responsibility" through encouraging greater autonomy in, for example, taking decisions. It is important to promote "responsibility", especially among the Malays, as it is a salient factor determining their success.

A "strategic approach" to learning contributes over 7 percent to Malay students' achievement variance. In other words, a Malay student's achievement is somewhat dependent on the extent to which he possesses a "strategic approach" to learning (student intends to get the best grades possible by being well-organized, making effective use of time and seeking out appropriate working conditions). A "strategic approach" to learning indicates

the use of both a deep and a surface approach to learning and, if supported by a competitive form of motivation, will form an "achieving orientation", that is, doing whatever is necessary to earn high grades.

"Competence" (rewards from a recognition of developing knowledge and skills; success in meeting achievement demands) contributes 6 percent to Malay students' achievement variance. In referring to global self-esteem, Harter (1983) splits "competence" into cognitive, social, and physical sub-areas. "Competence", in both cognitive and social areas, is equally important because lack of these abilities expresses negative affects towards self in relation to a particular task. Hence, such students may tend to give up or no longer wanted to participate, which may lead to failure. On the other hand, students' low on perceived competence in physical skills and activities may not have a negative effect on total self-esteem because they do not value physical competence as important for being successful (Rosenberg, 1979).

"Conscientiousness" (determination to carry out what is expected of them as well as possible) contributes 4.5 percent to Malay students' achievement variance. It is not surprising that this variable is somewhat important in determining their achievement because lack of determination to study may lead to early school withdrawal or giving up

schooling before completion. According to Ahmad (1981), this is a major problem in Malaysian rural schools. Altogether, student variables contribute 30.1 percent to Malay students' achievement variance.

b. *Iban*

"Strategic approach" is the best predictor and provides more than 21 percent of variance in Iban students' achievement. "Hope for success" provides an additional 20 percent to their achievement variance. These results indicate that success for Iban students is likely to depend on adopting a strategic approach to learning. To get the best grades possible they need to be well-organized, make effective use of time, seek out appropriate working conditions, and be alert to what type of work is rewarded most by individual teachers. This variable, "strategic approach" to learning, also appears in the regression equations for the Malay ethnic group and contributes 7 percent to their achievement variance. Thus, compared with other ethnic groups, Iban students are likely to be more competitive, by being determined to do better than others so as to maintain a high level of self-esteem.

Ibans are the poor people of Sarawak. Out of their total population of 396,280 (DSMS, 1980), 48.9 percent of the Ibans live below the poverty level which is much higher

than the national average of 20.7 percent (Kadam Kiai, 1990). In term of illiteracy rate (65 percent), Ibans stand out as one of the highest (Ko, 1984). More recently Ibans and other Sarawak indigenous ethnic groups are undergoing a rapid technical, social and educational change. They are making a conscious effort to inculcate attitudes and values in the young that are radically different from their elders who are shifting (itinerant) paddy field planters, hunters and craftsmen. Education is widely believed to be the key to upward social mobility and, thus, the Ibans are well on their way to economic and social development. Development in the State has been somewhat unbalanced as the opportunity structure in the urban sector is limited for the Ibans because the Chinese virtually control all commerce and business, and jobs in the government require at least eleven years of schooling. Consequently there is likely to be a discrepancy between educational and occupational aspirations and expectations.

The results, which show that Iban students' achievement in the SPM examination is significantly related to a "strategic approach" to learning and "hope for success" signify positive characteristics for successful achievement because, according to Entwistle and Ramsden (1983), a "strategic approach" when combined with "hope for success" will form an "achieving orientation". With such correlation, they are determined to do whatever is

necessary to earn high grades - a salient factor for Ibans achievement. It seems that Ibans are becoming aware of the importance of education and are determined to cope with national progress and developments. Schelsky (1961: 417) also noted that "...schools become a kind of distributive agency conferring future social security, status and consumption possibilities". All in all the predictor variables contribute 42.4 percent to Iban students' achievement variance.

c. *Melanau*

The best and the sole predictor of Melanau students' achievement is "sociability" which contributes 12 percent to achievement variance. Traditionally the autonomous, self-willed Melanau owes no permanent allegience to any person, institution or corporate group beyond the family which reflect the underlying values of individual autonomy, egalitarianism and sociability. Being sago planters and fishermen living in ***persisiran*** (coastal villages), it is not surprising that their way of life tempers their individualistic tendencies and enables them to develop a sense of sociability and gregariousness as each community tends to be socially and emotionally dependent upon each other. A few foremost authorities (Beebout, 1972) say that sociability associates significantly with academic achievement, especially at this adolescent stage (sixth formers aged about seventeen years), where parents'

involvement (parental control) has been carefully reduced and they turn to their peers for the support that was formerly provided by the family. This gives, to some extent, a confident baseline from which to progress towards independence. According to Brennan (1982), adolescents reporting themselves to be lonely, shy, or socially anxious appear to participate less often than their more sociable counterparts in peer activities. The adolescent tends to desire close, caring relationships with peers for the purpose of sharing mature affection, thoughts, concerns, and common interests, and to desire friends who are loyal, trustworthy, intimate, and who demonstrate potential for positive regard, admiration, and similarity (Rice, 1978). The Melanau students, who are likely to possess good relationships with others to gain acceptance at school, to enjoy collaborative work and activities with peers, tend to gain from these positive attitudes, and, thus, support the finding that the influence of "sociability" is considerable in leading to their success. The correlation matrix of regression analysis, also, shows that the variable "sociability" correlates significantly with Melanau student's achievement ($r = -.356$; $p < .05$). This negative correlation indicates that high achievement is significantly related to "sociability", thus, providing evidence that high achievers among Melanau ethnic group are highly sociable.

d. *Chinese*

The best predictor is "instrumental motivation" which contributes 10 percent to Chinese students' achievement variance. This indicates that their achievement is considerably dependent on the extent to which they possess "instrumental motivation", involving being interested in only qualifications, concerned with vocational and economic opportunities and working only because of external pressures. It is likely that the Chinese take education as a 'stepping stone' to qualify and reach prominence in the 'commerce and business arena' which they have virtually controlled ever since Malaysia gained **merdeka** (independence). There has been, and still is, an economic imbalance between the Chinese and the **Bumiputera** ('princely sons of the soil') or indigenous ethnic groups. De Tray (1984) noted that the Malaysian Chinese have generally been on the highest rung of the socio-economic ladder and, historically, Chinese children have had a better education.

Apart from that, as mentioned in Chapter I, a large majority of the **Bumiputera**, who live in rural areas, are still left out of the mainstream of development as there is no good communicational system to link urban modernization with the undeveloped rural hinterlands. Sarawak still relies mostly on the oldest form of transportation by means of rivers, as "In 1984, there were only 965 kilometres of surfaced road outside the towns in the state" (Asian

Business, September 1986: 43). What Sarawak people called 'highway' is no better than a road to a paddy field, a rubber estate or an oil-palm plantation in Peninsular Malaysia. The present approach, taken by the Malaysian Government in an attempt to equalize educational and economic opportunities through the New Economic Policy announced in 1970, is yet expecting positive results. Thus, Chinese students are likely to be more motivated towards vocational and economic opportunities and, consequently, it is not surprising that "instrumental motivation", to some extent, plays an important role in determining their success.

"Hope for success", involving being competitive and determined to do better than others, is another salient factor contributing to Chinese students' achievement variance. In contrast, "fear of failure" (anticipating punishment of failure, irrespective of previous successes and worrying about being behind with work or doing worse than others), to some extent, also contributes to their achievement variance. These results indicate that apart from being competitive and determined in their studies, the Chinese students are likely to be aware of failure. Fear of failure makes them work even harder and, thus, gives them neither over-confidence nor the desire to give-up, which eventually may put them into a high ladder

of success. Altogether predictor variables contribute 18.4 percent to Chinese students' achievement variance.

e. *Bidayuh*

"Conscientiousness" is the best predictor contributing over 11 percent to Bidayuh students' achievement variance. This means that variations in Bidayuh students' achievement is dependent mostly on the variability of "conscientiousness" (determination to carry out what is expected of them as well as possible) scores. Bidayuh or Land Dayaks are the third largest indigenous group, numbering 107,549 in 1980, and forming 8.3 percent of Sarawak population (Ko, 1984). They are mainly engaged in the cultivation of dry paddy fields under the shifting cultivation system. Acording to MISS (1988: 3), "...the Bidayuh are restless, lively and energetic people". In other words, Bidayuh are traditionally accustomed to hardships and, thus, their children are also likely to be keen and conscientious in their studies which, to some extent, appears to influence their academic performance.

"Compliance" (acceptance of social norms, higher-order moral values, religious beliefs and compliance with responsible demands) and "locus of control" contribute 6.7 percent and 5 percent, respectively, to Bidayuh students' achievement variance. Some of the Bidayuh are Christian or

Muslim but the majority are Pagan and animism. The correlation matrix of regression analysis shows that the variable "locus of control" has a significant correlation with Bidayuh student's achievement ($r = -.140$; $p < .05$). This negative correlation indicates that high achievement is significantly related to 'external' locus of control. Thus, their possession of "compliance" and "external locus of control" is likely to reflect their belief in spirits, birds, dreams, luck and superior external power. This may be a possible reason why these variables are related to achievement.

"Surface approach" to learning contributes another 6.7 percent to Bidayuh students' achievement variance, suggesting that they are likely to rely on rote learning leading to what Entwistle and Ramsden (1983) refer to as "reproducing orientation" (memorization). Moreover, the 'external' locus of control is important as it contributes 5 percent to their achievement variance, together with "instrumental motivation" contributing 1 percent. In Malaysian culture, religious beliefs and faiths are given priority as all deeds are regarded as being monitored closely by God. They tend to be more spiritual and morally motivated, and be less materialistic. Thus, they are likely to be more interested in their own beliefs and faiths rather than being concerned for vocational and economic opportunities. Altogether predictor or students' variables

contribute 30.3 percent to Bidayuh students' achievement variance.

f. *Others*

Others consist of the Sarawak indigenous ethnic groups of Kayan, Kenyah and Kelabit who live mostly in the interior highlands of the Fourth, Fifth and Seventh Divisions in Sarawak. According to the 1980 population census, this group consisted of 69,065 individuals (DSMS, 1987). Their religion is partly based on bird omens and dreams. The sole predictor variable is "locus of control", which contributes 29.2 percent to achievement variance for this mixed ethnic group. The *t*-test results in Table 5.4 show that the mean score among "external" students is significantly higher than for those with "internal" locus of control in academic achievement (mean= 30.20 for internal, 22.90 for external; t= 2.31; $p<.05$). Note that a low mean score for achievement implies the group performs at a high achievement level (see Chapter II).

TABLE 5.4
The difference in SPM achievement between internal and external locus of control.

	Locus of Control	Mean	SD	SE	*t*	Significance
Achievement.	Internal	30.20	4.20	1.88	2.31	$p<.05$
	External	22.90	6.33	2.00		

SD- Standard deviation; SE- Standard Error; df= 16.

Thus, this finding fits in with the attribution theory (Rotter, 1954; Lefcourt, 1982), as this mixed- group tends to attribute its success to luck, good fortune or on outer-power beyond its control rather than its own competence, abilities and efforts.

The most important variables predicting achievement in (a) arts stream and (b) science stream.

With regards to the arts-stream students, "warmth" (warmth and empathy from parents) is the best predictor which contributes over 10 percent to their achievement variance. In Kozeki's motivational hierarchy, "warmth" comes in the early stages of child-rearing where "the relationship with parents establishes one strong and continuing motivation - a pleasuring parent provides its rewards in the expression of *warmth*, of caring, loving sentiments" (Kozeki, 1985: 190). Burgess (1973: 169) also stressed the importance of parents spending time with their children to make them more confident and articulate in their learning,

> You cannot expect children to chat about their doings at school to order or by appointment. This sort of communication can come only if it arises naturally, in a situation where the children are encouraged, in normal course of events, to chat about what they are doing. Nor can you expect a child to have confidence to mention a problem if you have not established a relationship in which this sort of discussion is normal.

It is, no doubt, important to establish a warm reciprocal relationship with parents because they can give encouragement and praise, and show interest, love and liking. But as children develop, in this case they are adolescents, the strong bond with parents should be challenged by an increasing demand for autonomy and independence. If, at this age of seventeen, they are considered too demanding or reliant on parental love, empathy and approval, they are likely to be rather dependent and passive followers, who are likely to be seen as conformists. According to Kozeki (1985), this type of students' basic motivation tends to be "fear of failure", which is in line with the present finding where "fear of failure" contributes 1 percent to arts-stream students' examination achievement variance. This is what Kozeki (1985: 193) refers as,

> ...the pupil may want to solve everything by relying on personal relationships and so become anxious, over-dependent, even hypocritical and insincere.

Arts-stream students are likely to be over-dependent on parents or to possess an excess of "warmth" motivation which, to some extent, determines their achievement. This trend is supported by the correlation matrix in the regression analysis, in which, "warmth" correlates significantly with achievement ($r = .325$; $p < .01$). This positive correlation indicates that low achievement is likely to be affected by the variable "warmth". Thus, it is likely to

be one of the reasons why, as a whole, arts-stream students are performing less well than science-stream students.

The best predictor for science-stream students is "residency - urban/rural" which contributes about 18 percent to overall achievement variance. Results in Table 4.2D show that urban students have significantly higher mean scores in almost all subject areas than rural students. The *t*- test result in Table 5.2, also, supports the previous findings, in which, "urban" students go with high achievement (means= 21.94 for urban students, 26.61 for rural students; $t = -9.55$; $p<.01$). Based on these results, it is suggested that science-stream students' achievement is likely to be dependent on those from an urban community.

TABLE 5.2
The difference in SPM achievement between urban and rural students.

	Residency	Mean	SD	SE	t	Significance
Achieve-ment.	Urban	21.94	8.21	0.35	-9.55	p<.01
	Rural	26.61	5.71	0.29		

SD- Standard Deviation; SE- Standard Error; df=923
[A low mean score for achievement means the group performs at a high achievement level.]

What Hirschman (1972: 108) found about forty years ago in Peninsular Malaysia is still valid and applicable in Sarawak today where "educational facilities in the late

1960s were much more accessible to the essentially urban Chinese and Indians while educational facilities for the essentially rural Malays were much less accessible". A strategy for improving the academic achievement of rural students has been the establishment of boarding schools and more hostel facilities in day schools. This strategy is very suitable for Sarawak because of the scattered nature of its population where communication is a major problem. Thus, the boarding system remains a special feature in Sarawak schools. In 1987 the total boarding enrolment in Sarawak was 98,845 out of a total enrolment of 341,228 pupils. Board and lodging were provided in 465 primary and 88 secondary schools. Out of a total primary enrolment of 218,501 pupils, 49,112 or 22.5 percent are boarders. In the secondary school system, out of a total enrolment of 122,727 pupils, 49,733 pupils or 40.5 percent are boarders (MISS, 1988). In Peninsular Malaysia, "residential (boarding) schools are increasing fully equipped, usually have a small class size, fewer teaching hours for the teachers and more personal supervision of the students' work. Out-of-class contact with teachers is more frequent, which is a further stimulus to the students" (Spaulding and Hussain, 1989: 108). Thus, only selected students with good public examination results could go to such residential or boarding schools. This remains an 'idealistic dream' in Sarawak where educational provision is not as generous. Most schools have more than 40 pupils per class,

more teaching periods involving over 30 hours per week and lack of facilities and academic staff (personal interview). Unliked in Peninsular Malaysia, "residential/boarding" schools in Sarawak are more like 'hostels' with their main objective to accommodate as many as possible rural students. In other words, there is still significant educational Peninsular Malaysia-Sarawak and urban-rural imbalances in Sarawak as noted by Hirschman (1978). This is accentuated by poor communication where in most rural areas the people have never been visited by a 'mobile library', there are no bookstalls, and often newspapers are only read a day or two later than read in urban areas. Good science facilities, modern equipment and qualified teachers are more likely to be found in urban areas. Hence, it is not surprising that "residency" is a salient factor among the selected best predictor variables of achievement of science-stream students.

The variables "competence", "sociability", "father's qualification", "compliance" and "fear of failure" are less vital factors as each of them contributes only 1 to 3 percent to arts-stream students' achievement variance. Altogether the predictor variables explain 24.5 percent of overall achievement variance for arts-stream students.

5.3 Conclusions

This study is, in many respects, exploratory, but tentative conclusions may be derived. First and foremost are the answers to the research questions and, in addition, the evidence supporting the alternative hypotheses. These results may be regarded as offering support, on a wider basis, for the findings of previous research within the affective domain concerning students' study behaviours, academic motivation, locus of control, optimism versus pessimism and their relationships with achievement in high schools. The following observations are, therefore, made in the light of this study and evidence from the literature.

1. The Chinese ethnic group achieved the highest in the overall public examination, and, Malays achieved the lowest among all ethnic groups. Thus, the Chinese achieved the best results in the SPM examination compared to all Bumiputeras (indigenous) ethnic groups. [mean score analyses].

2. Science-stream students achieved better than arts-stream students; day scholars achieved better than boarders and urban students achieved better than (with a certain exception such as in Bahasa Malaysia) rural students in the SPM examination.
[mean score analyses, see Appendix 3E).

3. Science-stream students possess more compliance and conscientiousness than arts-stream students. Thus, science-stream students tend to be more acceptable of school norms and to have more determination to carry out what is expected of them as well as possible [t-analyses].

4. Science-stream students tend to adopt a deep approach and a surface approach to learning and an holistic style of learning more than arts-stream students which suggest the possibility of science-stream students possessing both 'meaning orientation' in that these students search for personal understanding, and 'reproducing orientation' which leads to memorization. Probably this is why science-stream students achieved significantly higher than arts-stream students in all subject areas, apart from the reason that they are selected students who possessed good results in the SRP external examination [t- analyses].

5. Arts-stream students' achievement is likely to be affected by the variable "hope for success" and "optimism". Such achievement depends, also, on the extent to which a "strategic approach" to learning (achieving orientation) is adopted, that is, the

tendency to do whatever is necessary to earn high grades [t- analyses].

6. The best predictor contributing to Bahasa Malaysia achievement is "residential status - day scholars/ boarders". The t- analysis shows that the boarders' contribution to achievement is superior to that of day scholars in this subject area [regression and t- analyses].
   Low achievement in Bahasa Malaysia is associated with lack of interest, adoption of a surface approach to learning (rote learning), too sociable and lack of hope for success [correlation analyses].

7. The best predictor contributing to English Language achievement is, also, "residential status - day scholars/boarders". In English Language, day scholars' (in the reversed of Bahasa Malaysia) contribution to achievement is superior to that of boarders [regression and t- analyses].
   Low achievement in English Language is related to fear of failure and intrinsic motivation.
   [correlation analyses].

8. The best predictor contributing to Malay Literature achievement is "conscientiousness" (determination to work hard and to carry out what is expected of them

as well as possible) [regression analyses].
Low achievement in Malay Literature is related to less adoption of a serialist style of learning.
[correlation analysis].

9. The best predictor contributing to Fine Arts achievement is "academic stream- science/arts". The *t*-analysis shows that science-stream's achievement in Fine Arts is superior to that of arts-stream.
[regression and *t*- analyses].
Low achievement in Fine Arts is associated with lack of responsibility [correlation analysis].

10. The best predictor contributing to History achievement is "optimism" [regression analyses].
Low achievement in History is related to adoption of a surface approach to learning (rote learning), possession of a high degree of sociability and warmth, and fear of failure [correlation analyses].

11. The best predictor contributing to Geography achievement is "academic stream" [regression analysis], whereby, science-stream's to achievement is superior to that of arts-stream in this subject area.
[*t*- analysis].
Low achievement in Geography is related to fear of failure [correlation analysis].

12. The best predictor contributing to Physics achievement is "fear of failure" [regression analysis]. This result supports what Birney *et al.* (1969) noted, that fear of failure pushes some pupils to work harder. [correlation analyses].

13. The best predictor contributing to Biology achievement is "residency- urban/rural". The *t*- analysis shows that urban students' achievement is superior to that of rural students in Biology [regression and *t*- analyses].
    Low achievement in Biology is associated with fear of failure and the absence of a serialist style of learning [correlation analyses].

14. The best predictor contributing to Additional Mathematics achievement is "residency- urban/rural". Again, the *t*- analysis shows that urban students' achievement is superior to that of rural students in this subject area [regression and *t*- analyses].
    Low achievement in Additional Mathematics is related to fear of failure, a surface approach to learning, hope for success (over-confidence) and a high degree of instrumental motivation [correlation analyses].

15. The best predictor contributing to Chemistry achievement is, also, "residency- urban/rural", whereby, urban students' achievement is surperior to that of rural students in Chemistry [regression and *t*-analyses].

    Low achievement in this subject area is associated with a high degree of fear of failure, hope for success, surface and strategic approaches to learning, sociability, compliance and intrinsic motivation [correlation]. The results suggest that hoping for success, adopting a strategic approach to learning and possessing an intrinsic motivation are insufficient if there are lack of qualified teachers and facilities. This is probably what Perrott (1975) refers to as, "...most people have been consumers of the products of science without understanding its spirit, methods and basic concepts." (page 2).

16. The best predictor contributing to Modern Mathematics achievement is "academic stream- arts/science". *Science-stream students' achievement emerged superior to that of arts-stream students [regression and t-* analyses].

    Low achievement in Modern Mathematics is linked with fear of failure, hope for success, compliance and an adoption of a strategic approach to learning. [correlation analyses].

17. The best predictor contributing to Human Biology achievement is "residential status- day scholars/ boarders". The *t*- analysis shows that day scholars' achievement is superior to that of boarders. [regression and *t*- analyses].
Low achievement in Human Biology is related to the lack of conscientiousness and the adoption of a low surface approach to learning [correlation analyses].

18. The best predictor contributing to Elementary Islamic Knowledge is "residency- urban/rural". Rural students' achievement is superior to that of urban students [regression and *t*- analyses].
There is no significant correlation between achievement in this subject area and the students' variables. [correlation analyses].

19. The best predictor contributing to Advanced Islamic Knowledge is a "serialist style" to learning. [regression analyses].
There is, also, no significant correlation between achievement in Advanced Islamic Knowledge and the students' variables [correlation analyses].

20. The best predictor contributing to Arabic Language achievement is "residential status- day scholars/ boarders". Day scholars' achievement is superior to

that of boarders [regression and *t*- analyses].
Low achievement in Arabic Language is related to a high degree of compliance [correlation analysis]. This is probably because 'defined rules and norms' in school may tend to be inadequate, or, according to Kozeki (1985), a compliant student is likely to be too dependent and reliant on teachers.

21. The best predictor contributing to Chinese Language achievement is "academic stream- arts/science". Science-stream students' achievement is superior to that of arts-stream students.
Low achievement in this subject area is associated with fear of failure and intrinsic motivation.
[regression, *t*- and correlation analyses].

22. The best predictor contributing to Commerce achievement is "residency- urban/rural". Urban students' achievement is superior to that of rural students [regression and *t*- analyses], probably because rural students tend to lack of exposure to trade and commercial activities compared with urban students.
Low achievement in Commerce is related to high hope for success, high fear of failure, possession of a strategic approach to learning and being too sociable.
[correlation analyses].

23. The best predictor contributing to General Science achievement is "strategic approach" to learning [regression analysis].
There is no significant correlation between achievement in this subject area with students' variables.

24. The best predictor contributing to Principles of Accountancy achievement is "holist style" [regression analysis].
Low achievement in this subject area is associated with less warmth, less sociability, lack of competence, less responsibility, less comliance, lack of instrumental motivation and conscientiousness.
[correlation analyses].

25. The best predictor contributing to science-stream students' over-all examination achievement is "residency- urban/rural". Urban students' achievement is superior to that of rural students.
[regression and t- analyses].
This is probably due to the fact that there are significant differences between urban and rural life styles and in the quality of teaching, educational facilities and economic status as between the urban and rural areas.

26. The best predictor contributing to arts-stream students' over-all achievement is "warmth" (empathy and close relationship with parents) [regression analysis]. In other words, the result indicates that the more warmth they possess the better is their achievement. Kozeki (1985) suggested that if they possess too much "warmth" motivation, they are likely to be over-dependent and to become passive followers, which, does not seem to fit in the present finding. Thus, this may explain why their achievement is significantly lower than that of the science-stream students.

27. Girls possess significantly more fear of failure and likely to possess more external locus of control than boys, thus, supporting previous researches. In contrast, girls seem to possess more conscientiousness than boys, that is, they are more determined to carry out what is expected of them as well as possible. Concerning achievement in the different subject areas, girls stand a better chance of beating boys in English Language and Malay Literature [t- analyses].

28. Boys are significantly more reliant on a holist style of learning (concentrate initially on a broad view of the topic - 'see things as parts of a whole', learn best by making use of analogies and illustrations and

prefer anecdotal personalized teaching) than girls. Boys seem to achieve better than girls in History probably because this subject area is male dominated since textbooks use mainly male examples of warriors and nationalists [t- analyses].

29. Day scholars have significantly more interest and instrumental motivation than boarders and these seem to foster much better achievement than boarders in almost all subject areas offered in the SPM examination [t- analyses].

30. Boarders possess significantly more fear of failure than day scholars, and at the same time tend to adopt a strategic approach to learning, leading to an achieving orientation (doing whatever is necessary to earn high grades). Boarders, also, possess considerably more optimism than day scholars. [t- analyses].

31. Urban students possess significantly more interest, instrumental motivation and conscientiousness than rural students. They also achieve significantly better in all, except in two subject areas, possibly due to better school facilities, more research and information centres, more graduate teachers and more exposure to modern developments [t- analyses].

32. Rural students are significantly more optimistic than urban students, and to some extent, more 'external' in their locus of control [*t*- analyses]. This is probably because students from rural areas are likely to be associated with such beliefs as animism based on bird omens and dreams. Being reared in poverty their desires and aspirations to further their studies depend very much on external circumstances such as whether their labours are needed on the farm and whether or not they secure government financial support. Thus, rural students may tend to perceive their achievement as resulting from the guidance of a 'super-power' (spiritual power), luck or chance.

33. High achievers are more inclined to adopt a serialist style of learning which may leads to a reproducing orientation (memorization) than low achievers. [*t*- analysis].

34. Low achievers possess significantly more fear of failure, hope for success, optimism and adopt more strategic approaches to learning than high achievers. Fear of failure, according to Birney *et al.* (1969), pushes some students to work harder, and, when combined with hope for success, optimism and a strategic approach to learning may possibly cause them

to survive and pass the former SPM examination [*t*- analyses].

35. The variable "optimism" correlates significantly with such variables as intrinsic motivation, conscientiousness and hope for success. All these variables provide students with the necessary determination, competition and self-esteem to succeed. Such optimism is, also, associated with a holist style and a deep approach to learning which form a meaning orientation (search for personal understanding). Thus, all of these factors are likely to lead to high achievement [correlation analyses].

36. There are no significant differences in achievement between students who possess internal locus of control and those who possess external locus of control. This result rejects the previous findings proclaimed that one ought to possess an internal locus of control in order to obtain a high achievement level. Thus, this study concludes that the previous findings are probably true in the case of younger pupils but not at the adolescent stage where their own IQs, abilities and efforts are likely to be more important in contributing to achievement [*t*- analyses].

37. "Academic stream- arts/science" is the best predictor contributing to students' overall achievement in the SPM external examination. Science-stream students' achievement in the whole examination is superior to that of arts-stream students [regression and *t*-analyses]. It is not surprising that achievement in the SPM is higher for science-stream students because (a) they are 'selected' students who obtained good results in the previous SRP (Lower Certificate Examination) external examination, and (b) they tend to receive better facilities and to have more trained teachers as a result of undergoing government educational programmes which promote modern science and technology.

38. The best predictor contributing to each ethnic group's achievement is as follows:
(a) "responsibility" for Malays; (b) "strategic approach" to learning for Ibans; (c) "sociability" for Melanau; (d) "instrumental motivation" for Chinese; (e) "conscientiousness" for Bidayuh; and (f) "locus of control" for Others (mixed indigenous groups). Students with 'external' have significantly higher mean score than students with 'internal' locus of control in the mixed ethnic groups.
[regression and *t*- analyses].

39. The best predictor contributing to arts-stream students' overall achievement is "warmth" (warmth and empathy from parents). Thus, they are likely to have more encouragement and interest actively shown by parents [regression analyses].

40. The best predictor contributing to science-stream students' overall achievement is "residency- urban/ rural". Urban students' achievement is superior to that of arts-stream students in almost all subject areas. This is probably because there are still an urban-rural educational imbalance where educational facilities and graduate teachers are more accessible in urban areas than in rural areas [regression and t- analyses].

5.4 Recommendations

It is rather difficult to make strong recommendations from an *ex post facto* research as the results do not show clear cause-and-effect relationships. The literature and the data collected from the questionnaires, however, provide evidence to back up suggestions for improvements and further research.

(a). Improvement of students' achievement

1. It is obvious, in this study, that Malay students achieved the lowest grades among students of all ethnic groups in the SPM external examination. Thus, this situation needs immediate remedial action to allow Malay students to undergoextra classes or tuition through the Sarawak Education Department, **Persatuan Melayu Sarawak** (Sarawak Malay Association), **Kesatuan Guru-guru Bumiputera Sarawak** (Sarawak Native Teachers' Union) and **Yayasan Sarawak** (Sarawak Foundation).

2. The present study has identified the best predictor contributing to achievement in each subject area and among each ethnic group. It is suggested that teachers and students should pay more attention to these variables. Teachers could possibly give guidance and remedial action to help students to adopt appropriate learning approaches, learning styles and to make good use of motivation associated with 'hope for success' and 'fear of failure'.

Example: Low achievement in **Bahasa Malaysia** is associated with lack of interest, adoption of a surface approach to learning (rote learning), being too sociable and lacking of hope for success.

Teachers, of course, have numerous ways to make the subject interesting and attractive. Students should be guided not to rely entirely on rote learning. It is, of course,

improper to encourage adolescents to be less sociable since that is their nature. Instead teachers and parents may be able to guide them to improve their skills in time and personal management, so that they have more time to study and to motivate them to be independent and to carry out what is expected of them as well as possible.

(b). Institutional problems that need improvement

1. In the present Malaysian educational system, students are, somewhat, 'forced' to be an arts or science stream based student strictly on their **Sijil Rendah Pelajaran** (Lower Certificate of Education) external examination results. Those with good results are streamed into science and those with poor results are put into an arts-stream. This policy fits in with the Government's promotion of science and technology in schools. Consequently, science-stream students tend to enjoy better facilities (text-books and learning materials) and more ideal learning enrolments than arts-stream students. The present study finds that this trend seems to affect the SPM performance, whereby, science-stream students' achievement remain superior to that of arts-stream students. It is, therefore, suggested that the academic streams be abolished and replaced by an "open-system", whereby, students are free to choose the subjects they like but the choice of

which must be properly guided by career and guidance teachers.

2. This study, also, finds that boarders' achievement is inferior to that of day scholars. This is probably because boarding-house (school hostel) in Sarawak merely provide accommodation. These are often qualitatively very poor compared with the average home environment. There are numerous researches which relate high achievement to good learning environment (Fraser, 1983 & 1986; Moos, 1979; Wilkinson et al., 1988). It is strongly suggested that the Sarawak Education Department provides enough basic facilities, among others, such as study-tables and chairs, proper beds (in some cases boarders sleep on the floor), good lighting, proper toilets and baths, sports and first-aid facilities.

Lack of infrastructure facilities in the boarding schools (small dining-hall; few toilets, baths and laundaries) make the boarders do things on shifts. They have to wake up as early as 5.00 o'clock in the morning to get ready for breakfast and be on time for school which starts around 7.20 a.m. It is suggested that schools should start at 8.00 a.m. and close at 1.30 p.m. to enable them to wake up much later and be back about lunch time. Since most schools have two-sessions, the afternoon session could start immediately after the morning session and close

around 6.30 p.m. so as to reach home well before dark. In schools where there are two sessions, it is, also, suggested that the examination classes (Form III, Form V and Upper-VI) be in the morning so as to give them more time to study, go to private tuition or public library in the afternoon. As a long-term recommendation, these two-session classes should be abolished so that (i) teachers can display students' work at all time, and, in this way may nurture a sense of responsibility and pride and to promote a "self-belonging" within the class group and (ii) teachers and students can prepare and leave teaching-learning materials for the following day undisturbed. Afternoons can then be used entirely for school extra-circular activities such as games, sports, clubs and parent-teacher meetings. These could be achieved when more schools are built.

The warden-student ratio in most boarding schools is very low (roughly 1: 200) and, thus, boarders tend to get inadequate attention and guidance. This problem should be remedied by the authorities (school and the education department) by appointing more wardens.

3. Information provided by school offices show that there are very few graduate teachers in schools. Lack of qualified and well-trained teachers is a salient factor that may lead to students' low achievement in the SPM

examination in Sarawak. Thus, a quick solution of this problem should be undertaken. One solution is by assigning the task to the branch campus of **Universiti Pertanian Malaysia** (Agriculture University of Malaysia) in Sarawak, or to build a new State university, to conduct degree courses and recruit more candidates to a teaching-career.

4. The present study, also, finds that rural students' achievement is inferior to that of the urban students. These results suggest that improved physical facilities needed to be provided to rural schools such as roads, educational broadcast, transportation and mobile libraries.

(c). Further Research

Based on the findings of this study, the following research topics are recommended:

1. The present study is an *ex post facto* research, whereby, the results of the SPM academic achievement are already known. In order to make an early possible diagnosis, there needs to be a specific study on students' learning approaches, learning styles, school motivation, locus of control and optimism well before the SPM examination so as to be better prepared for any remedial actions.

2. The present study is limited to high schools in Kuching City. Thus, a longitudinal study which covers a wider range of samples needs to be undertaken to find out whether or not learning approaches, learning styles, school motivation, locus of control and optimism are stable over a period of years.

3. It seems that one of the prominent findings of this research indicates that the variable "residency- urban/ rural" contributes significantly to achievement. It is likely that an ethnic factor also has contributed to this finding because most Chinese, for example, reside in the urban area. These results suggest the need for further research since this phenomenon has not been examined in the present study.

Other researches using different methodologies are suggested such as:

1. Ethnographic or qualitative research on learning approaches and styles based on individual ethnic group.

2. Experimental researchon the different types of "learning approaches and styles" and its effect on achievement.

3. Case-Study research such as the effect of "school motivation" and school environment on achievement.

4. Action research on, for example, the effect of teaching style on the learning approaches and styles and achievement.

5. Policy research on, for example, the effects of Government policy on streaming in relation to students' success in their academic achievements and later careers.

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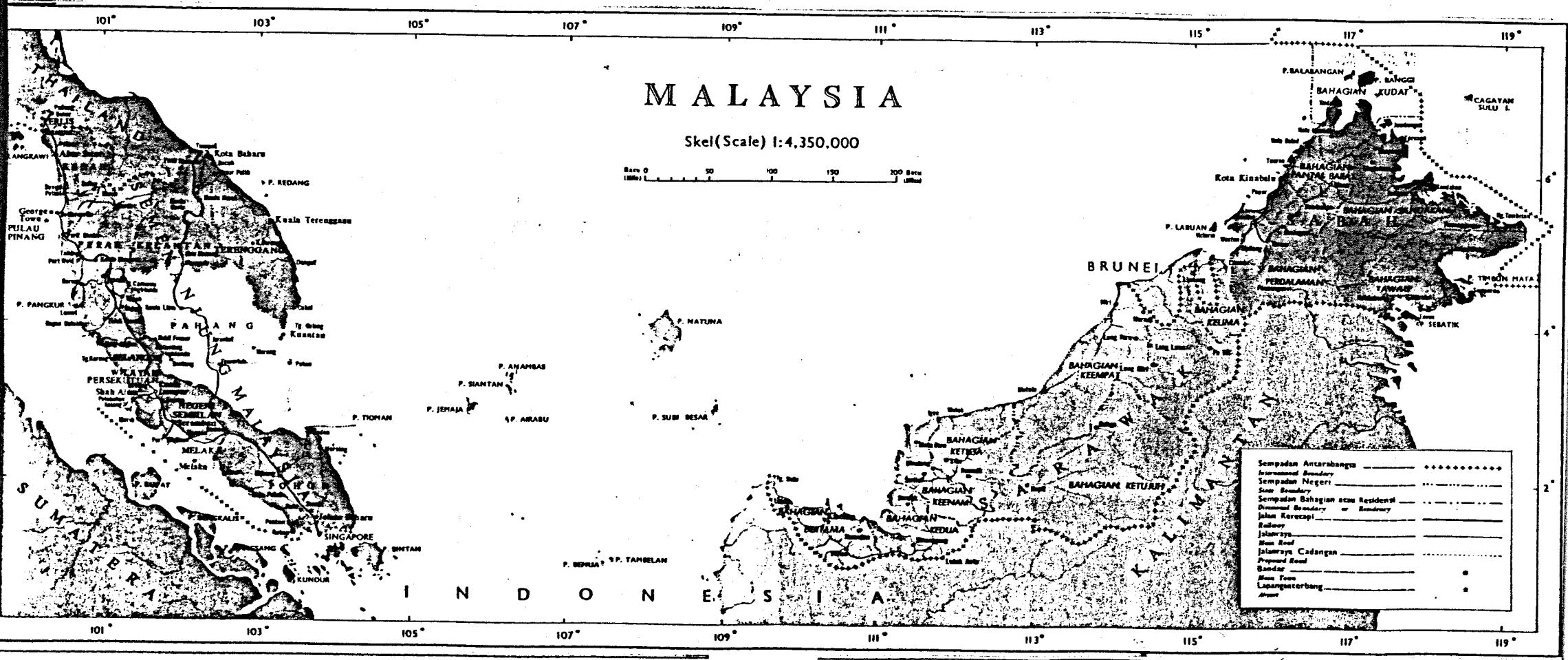
APPENDIC 1A

M A L A Y S I A

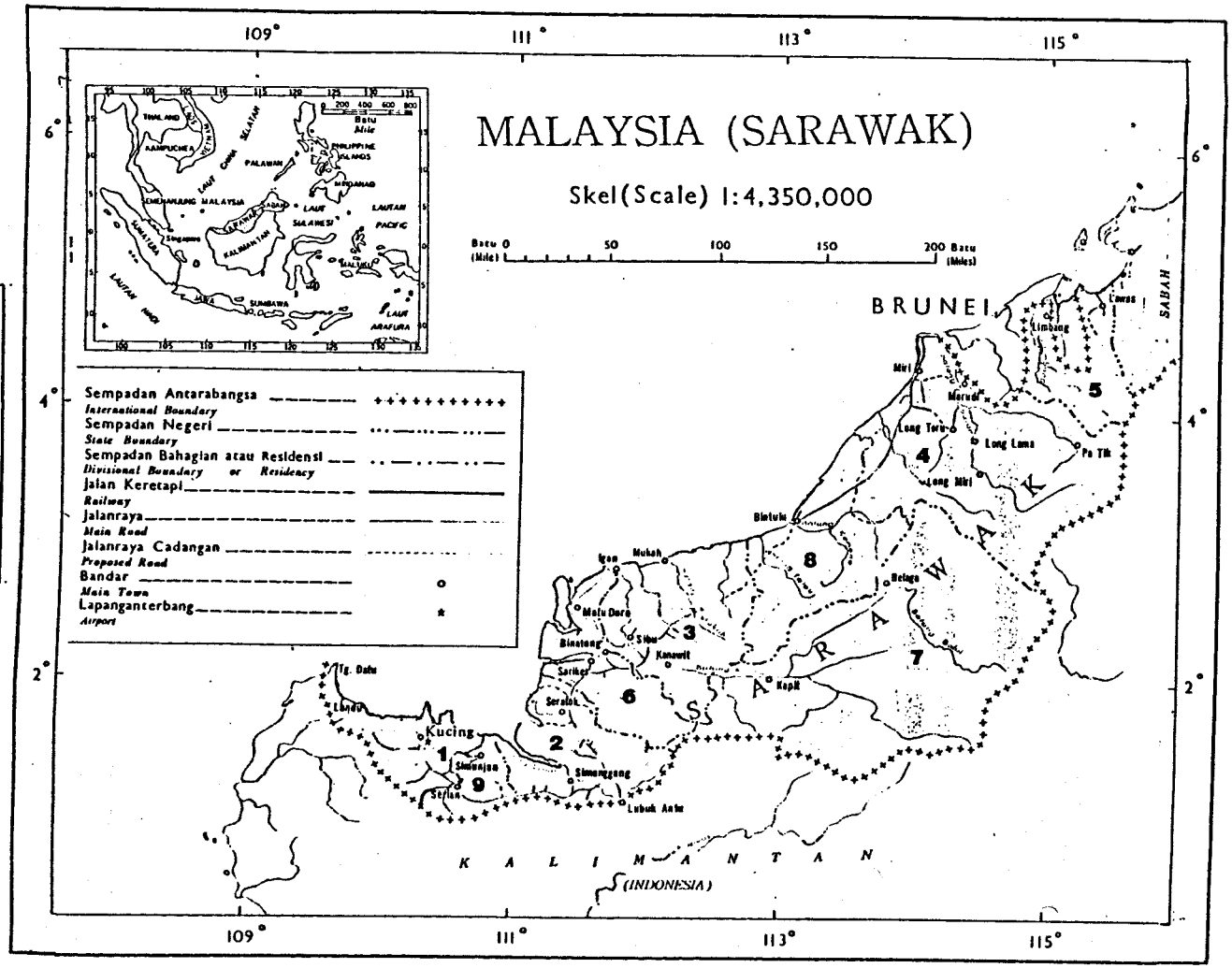


APPENDIX 1B

POLITICAL AND ADMINISTRATIVE BOUNDARIES OF SARAWAK

Key:

DIVISION	HEADQUARTERS
1-	KUCHING
2-	SRI AMAN
3-	SIBU
4-	MIRI
5-	LIMBANG
6-	SARIKEI
7-	KAPIT
8-	BINTULU
9-	KOTA SAMARAHAN



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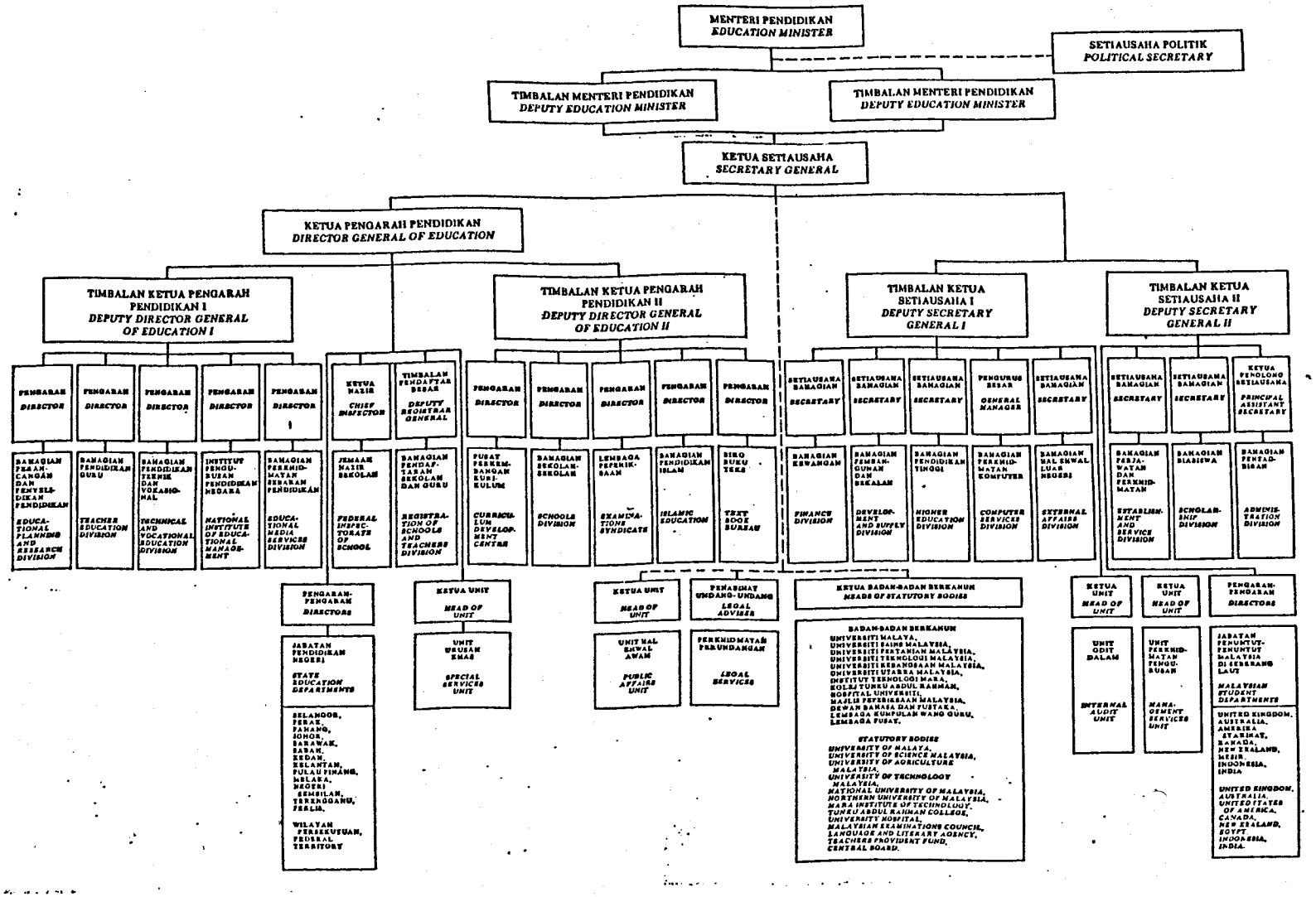
Printed by the Directorate of National Mapping, Malaysia 1982

APPENDIX 1C

STRUKTUR ORGANISASI KEMENTERIAN PENDIDIKAN MALAYSIA
ORGANISATION STRUCTURE OF THE MINISTRY OF EDUCATION, MALAYSIA



APPENDIX 1D

*BAHASA MALAYSIA (NATIONAL LANGUAGE) IN SCHOOLS**

Year	Implementation
1957 -	National Language was made a compulsory subject at all levels in all assisted primary and secondary schools.
1958 -	The establishment of Malay-medium secondary classes which eventually developed into National Secondary Schools.
1963 -	(a) The establishment of the first fully residential Malay-medium Secondary School in Kuala Lumpur - Alam Shah National Secondary School. (b) Malay-medium Sixth Form Classes started in Alam Shah National Secondary School, Kuala Lumpur.
1965 -	First batch of Malay-medium pupils admitted to University of Malaya.
1968 -	(a) First batch of Malay-medium students graduated from the University of Malaya. (b) Malay-medium classes in Secondary Vocational Schools. (c) Five subjects taught in Bahasa Malaysia in Standard I- III in National-Type English Primary Schools.
1969 -	Civics taught in Bahasa Malaysia in Standard IV in in National-Type English Primary Schools.
1970 -	(a) All subjects in Standard I taught in Bahasa Malaysia in National-Type English Primary Schools. (b) Geography and History taught in Bahasa Malaysia in Standard IV in National-Type English Primary Schools. (c) Malay-medium classes in Secondary Technical Schools.
1973 -	All Arts subjects in Form I to be taught in Bahasa Malaysia in National-Type English Secondary Schools.
1975 -	(a) No more English-medium Remove Classes. (b) National-Type English Primary Schools will be fully converted to National Primary Schools.

1976 - (a) All Arts, Science and Technical subjects in Form I to be taught in Bahasa Malaysia in the National-Type English Secondary Schools.
(b) All Arts subjects in Form IV to be taught in Bahasa Malaysia.

1978 - Arts stream in Form VI (Lower) to be taught in Bahasa Malaysia in National-Type English Secondary Schools.

1980 - First year in Arts and allied courses to be taught in Bahasa Malaysia in the universities.

1981 - All Arts, Science and Technical streams in Form VI (Lower) to be taught in Bahasa Malaysia in National -Type English Secondary Schools.

1982 - National-Type English Secondary Schools will be fully converted to National Secondary Schools.

1983 - First year in all courses (Arts, Science, Medical, Engineering, etc.) to be taught in Bahasa Malaysia in the universities.

* Schools in Peninsular Malaysia only.
Implementation of Bahasa Malaysia in Sarawak and Sabah were much later in late 1970s.

Source: *Report on the Implementation of the Recommendations of the Education Review Committee, 1960*, Dewan Bahasa Dan Pustaka, Ministry of Education Malaysia, Kuala Lumpur, 1971, pp. 37-38.

APPENDIX 1E

BAHASA MALAYSIA (NATIONAL LANGUAGE) IN EXAMINATIONS

Year	Implementation
1957 -	Introduction of the Federation of Malaya Certificate of Education Examination (English medium) in which a pass in National Language was compulsory.
1960 -	The Lower Certificate of Education Examination was conducted for the first time in Malay language.
1962 -	(a) A pass in National Language was made compulsory in the Lower Certificate of Education Examination (English medium). (b) The Federation of Malaya Certificate of Education Examination was conducted for the first time in Malay language.
1967 -	Higher School Certificate Examination for Arts Stream in Malay language.*
1969 -	(a) Higher School Certificate Examination for Science Stream in Bahasa Malaysia. (b) Malaysia Certificate of Vocational Education Examination in Bahasa Malaysia.
1970 -	(a) The Overseas Cambridge School Certificate Examination was abolished. All Form V pupils in English Secondary Schools to sit for the Malaysia Certificate of Education (M.C.E.) Examination in which a pass in Bahasa Malaysia I is compulsory. (b) The paper Bahasa Kebangsaan in the Lower Certificate of Education (L.C.E.) Examination (Bahasa Malaysia and English medium) was replaced by a higher paper Bahasa Malaysia.
1971 -	Geography and History in the Assessment Examination for Standard V pupils in National-Type English Primary Schools to be examined in Bahasa Malaysia.
1972 -	The paper Bahasa Malaysia I (Bahasa Kebangsaan) in the Malaysia Certificate of Education (Bahasa Malaysia and English medium) to be replaced by a higher paper Bahasa Malaysia (Bahasa Malaysia II/ Bahasa Melayu).
1974 -	(a) Arts and Crafts and Music to be examined in Bahasa Malaysia in the L.C.E. Examination (English medium). (b) Assessment Examination for Standard V pupils in National-Type English Primary School to be conducted in Bahasa Malaysia.

1975 - Geography, History, Arts and Crafts and Music to examined in Bahasa Malaysia in the L.C.E. Examination (English medium).

1976 - Arts and Crafts and Music to be examined in Bahasa Malaysia in the M.C.E. Examination (English medium

1977 - Geography, History, Arts and Crafts and Music to be examined in Bahasa Malaysia in the M.C.E. Examination (English medium).

1978 - L.C.E. Examination (English medium) to be abolished. Form III pupils to sit for the L.C.E. Examination in Bahasa Malaysia only.

1979 - Arts subjects in the Higher School Certificate Examination to be conducted in Bahasa Malaysia only.

1980 - M.C.E. Examination (English medium) to be abolished. Form V pupils to sit for the M.C.E. Examination in Bahasa Malaysia only.

1982 - Higher School Certificate Examination (English medium) to be abolished. Form VI (Upper) pupils to sit for the H.S.C. Examination in Bahasa Malaysia only.

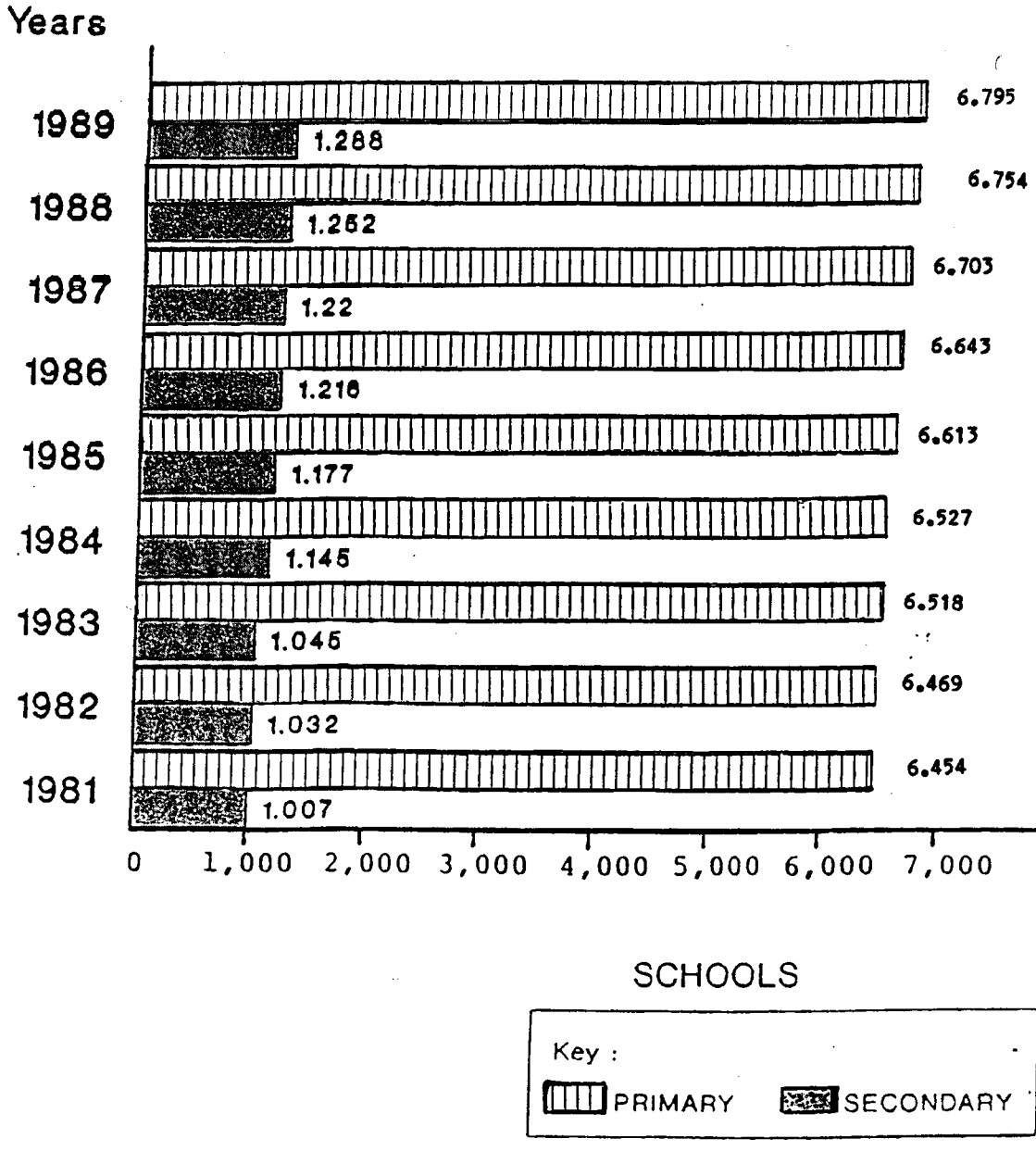
* The term 'Malay Language' was changed to 'Bahasa Malaysia' after 1967.

Source: *Report on the Implementation of the Recommendations of the Education Review Committeee, 1960*, Dewan Bahasa Dan Pustaka, Ministry of Education Malaysia, Kuala Lumpur, 1971, pp. 39-40.

APPENDIX 1F

SCHOOLS

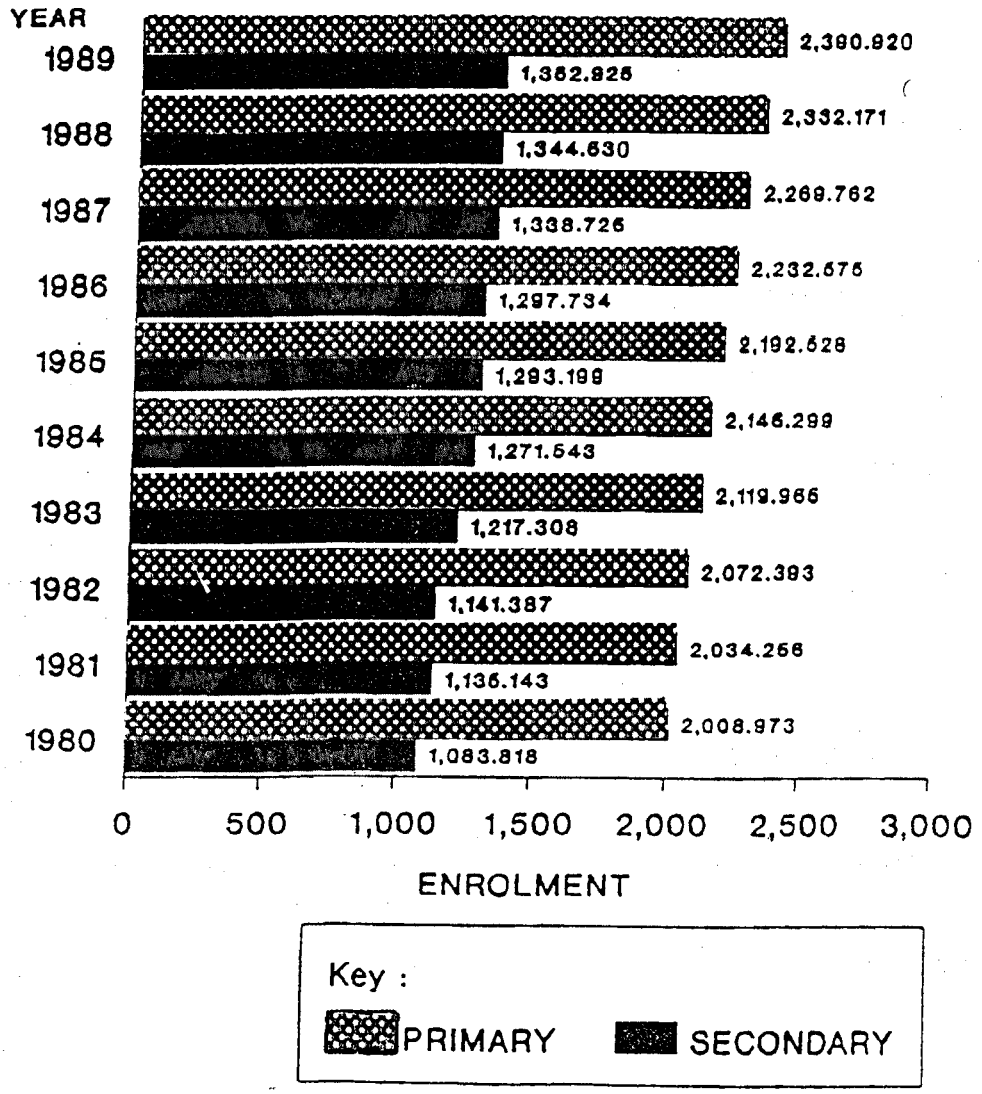
NUMBER OF PRIMARY AND SECONDARY SCHOOLS IN MALAYSIA, 1981-1989



(Source: 'EDUCATION IN MALAYSIA' Educational Planning and Research Division, Ministry of Education, 1989, Dewan Bahasa dan Pustaka, Kuala Lumpur.)

APPENDIX 1G

TOTAL ENROLMENT IN PRIMARY AND SECONDARY SCHOOLS FROM 1980-1989



(Source: 'EDUCATION IN MALAYSIA' Educational Planning and Research Division, Ministry of Education, 1989, Dewan Bahasa dan Pustaka, Kuala Lumpur.)

APPENDIX 3A

BAHAGIAN PERANCANGAN DAN
PENYELIDIKAN PENDIDIKAN,
KEMENTERIAN PENDIDIKAN,
PARAS 2, 3 DAN 5, BLOK J,
PUSAT BANDAR DAMANSARA,
50604 KUALA LUMPUR

Telefon: 2556900
Kawat: "PENDIDIKAN"

Ruj. Tuan:

Ruj. Kami: KP(BPPP)13/15/Jil.34(161

Tarikh: 11 Ogos 1989.

Encik Abang Ahmad Ridzuan B. Abang Awit
The University of Hull,
Institute of Education,
Cottingham Road,
Hull HU6 7RX,
England.

Tuan,

Kebenaran Bagi Menjalankan Kajian Ke Sekolah-Sekolah

Adalah saya diarah untuk memaklumkan bahawa permohonan tuan untuk menjalankan kajian mengenai
"Factors Relating To Achievement of High School Students In Kuching City, Malaysia",
telah diluluskan.

2. Kelulusan ini adalah berdasarkan kepada hanya apa yang terkandung di dalam cadangan penyelidikan yang tuan kemukakan ke Bahagian ini. Kebenaran bagi menggunakan sampel kajian perlu diperolehi daripada Ketua Bahagian/ Pengarah Pendidikan Negeri yang berkenaan.

3. Tuan juga dikehendaki menghantar senaskhah hasil kajian tuan ke Bahagian ini sebaik sahaja selesai kelak.

Sekian.

" BERKHIDMAT UNTUK NEGARA "

" CINTAILAH BAHASA KITA "

Saya yang menurut perintah,

(RUSLI BIN KASHIM)
b.p.: Pengarah,
Bahagian Perancangan dan
Penyelidikan Pendidikan,
Kementerian Pendidikan.

s.k:

i) Pengarah Pendidikan
Jabatan Pendidikan Sarawak.

APPENDIX 3B

JABATAN PENDIDIKAN NEGERI SARAWAK,
BANGUNAN TUN DATUK PATINGGI
TUANKU HAJI BUJANG,
JALAN SIMPANG TIGA,
93604 KUCHING.
SARAWAK.

Telefon: 243201
Kawat: PELAJARAN

Ruj. Tuan:

Ruj. Kami: 18/JP/KBMKKSS/MEN

Tarikh: 25 Julai 1989

Encik Abang Ahmad Ridzuan B. Abang Awit,
The University of Hull,
Institute of Education,
Cottingham Road,
Hull HU6 7RX,
England.

Tuan,

Kebenaran Menjalankan Kajian Ke
Sekolah-Sekolah

Surat tuan bil. KP/JPS(I) bertarikh 3.7.1989 itu adalah dirujuk.

2. Saya diarah untuk memaklumkan dengan sukacitanya bahawa Jabatan ini menyambut baik langkah dan usaha tuan membuat kajian terhadap pelbagai dimensi motivasi dan gaya pembelajaran di kalangan pelajar-pelajar Tingkat 6 kita, khususnya di Sarawak ini.

3. Dengan ini, kebenaran adalah diberi kepada tuan menghubungi sekolah-sekolah yang pihak tuan telah kesan itu, dan seterusnya menyampaikan kepada Jabatan ini sesalinan hasil dan dapatan kajian tuan itu nanti.

4. Pihak tuan bolehlah menyalinkan surat ini untuk diserahkan kepada Pengetua Sekolah berkenaan untuk simpanan sebagai rekod.

Sekian dimaklumkan. Semoga Berjaya.

" B "

Say

(PUTIT MATZEN)
b/p Pengarah Pendidikan
Sarawak.

s.k. 1. Fail Timbul PPS
2. PPK (H & D)

PM/mar

APPENDIX 3C

SPM SUBJECTS GROUPING

I - **Bahasa Malaysia ***

IIA
- English Literature
- Malay Literature
- Chinese Literature
- Bible Knowledge
- Elementary Islamic Knowledge
- Advanced Islamic Knowledge

IIB
- History
- Geography

III
- English Language
- Arabic Language
- Chinese Language

IV
- Elementary Mathematics (Mathematics 'C')
- Additional Mathematics

V
- General Science
- Agricultural Science
- Physics
- Chemistry
- Biology
- Human and Social Science

VI
- Fine Arts
- Music
- Food and Nutrition

VII
- Commerce
- Principles of Accountancy
- Building and Geometrical Arts
- Geographical and Engineering Arts
- Science Engineering

* **compulsory subject**

APPENDIX 3D

ITEM-ANALYSES OF THE INSTRUMENTS - *(I) SCHOOL AND SCHOOL WORK*
(II) LIFE ORIENTATION TEST
(III) ROTTER'S I-E LOCUS OF CONTROL

I - SCHOOL AND SCHOOL WORK

SUB-SCALE/ITEM:	QUESTION	MEAN	STDDEV	ITEM-TOTAL CORRELATIO
1. WARMTH (WAR):				
WAR1-	I enjoy talking to my parents about what happens in school.	2.32	1.52	0.39
WAR2-	Being friendly with other pupils is more important to me than competing with them.	2.40	1.59	-0.19 [#]
WAR3-	My parents are really happy when I do well at school, and that makes me feel good, too.	3.74	0.44	0.33
WAR4-	It could make me feel bad if I disappointed the teacher.	3.02	1.07	0.50
WAR5-	My parents don't seem to be all that interested in what I've done at school (-).	3.04	1.14	0.37
WAR6-	My parents are always helpful and encouraging about my school work.	2.50	1.43	0.29
WAR7-	Adults are not really interested in trying to understand young people's feelings (-).	1.28	1.21	0.30
WAR8-	People seem to find it difficult to get on well with me (-).	2.62	1.30	0.18 [#]
WAR9-	If I do well at school, my parents always show that they are pleased with me.	3.29	1.13	-0.04 [#]
2. SOCIABILITY (SOC):				
SOC1-	Most teachers are fair to all their pupils.	2.37	1.35	0.31
SOC2-	I enjoy helping other pupils with their school work.	2.50	1.36	0.49
SOC3-	There are very few teachers that I can really admire (-).	0.91	1.22	-0.13 [#]
SOC4-	I feel really good when my friends can see that I've done well.	2.92	1.22	0.19 [#]
SOC5-	Most teachers never bother to explain things well enough (-).	2.64	1.11	0.64
SOC6-	I don't really care what other people think about me (-).	2.37	1.57	0.10 [#]
SOC7-	It is often the teacher's fault when you get into trouble at school.	2.85	1.16	0.38
SOC8-	Most teachers try hard to help all the pupils in his school.	2.96	1.02	0.61
SOC9-	There's a really good feeling among the pupils in this school.	1.97	1.40	0.32

(Continued)

SUB-SCALE/ITEM	QUESTION	MEANS	STDDEV	ITEM-TOT CORRELAT
3. COMPETENCE (COM):				
COM1-	When I'm absorbed in something, my parents don't interrupt me.	1.95	1.58	0.24
COM2-	I get so involved in some topics at school that I try to follow them up on my own.	2.28	1.42	0.39
COM3-	I generally leave my homework until the last minute (-).	1.53	1.49	-0.19 [*]
COM4-	You can't expect pupils to come up with good ideas of their own(-).	1.72	1.35	0.06 [*]
COM5-	School provides a great deal of useful knowledge about life.	2.83	1.30	0.25
COM6-	My parents always value my opinion.	2.25	1.45	0.47
COM7-	The things we learn at school are not of any real use to me (-).	3.22	1.01	0.06 [*]
COM8-	I quickly lose interest if new topics are difficult (-).	1.80	1.40	0.24
COM9-	I don't mind working hard if I learn something in the process.	1.98	1.38	0.40
4. INTEREST (INT):				
INT1-	School is a boring place (-).	2.86	1.23	0.23
INT2-	I don't feel happy having to work on my own (-).	1.91	1.48	-0.05 [*]
INT3-	Many school lessons are dull and uninteresting (-).	2.28	1.37	0.35
INT4-	I spend a lot of my spare time finding out about things on my own.	2.25	1.52	0.08 [*]
INT5-	I feel happy and excited when a new topic is introduced.	3.00	1.30	0.24
INT6-	I always prefer to work things out for myself.	2.28	1.42	0.23
INT7-	There are a lot of lessons which I find exciting and challenging.	2.90	1.04	0.37
INT8-	I'm expected to work out too many things on my own (-).	1.65	1.39	0.14 [*]
INT9-	I find school work really very interesting.	1.80	1.27	0.42
5. COMPLIANCE (CLE):				
CLE1-	I want teachers to know that they can depend on me.	1.60	1.34	0.12 [*]
CLE2-	Punishment in schools is always unfair (-).	1.72	1.49	0.48
CLE3-	If teachers would let pupils do whatever they want to do, I would enjoy school very much more (-).	2.12	1.52	0.03 [*]

(Continued)

SUB-SCALE/ITEM	QUESTION	MEANS	STDDEV	ITEM-TOT CORRELAT
CLE4-	If I'm given something to do, I always try to do it as well as possible.	3.32	0.91	0.44
CLE5-	School rules are sensible: I always try to follow them.	2.62	1.40	0.62
CLE6-	When school work is hard I usually give up (-).	3.20	0.95	0.38
CLE7-	If I am expected to do something, I do it.	3.20	0.95	0.48
CLE8-	I always put a lot of effort into what we're asked to do in school.	2.62	1.29	0.60
CLE9-	Only weak people like rules and need order (-).	3.05	1.10	-0.12 [#]
6. RESPONSIBILITY (RES):				
RES1-	When I don't do well at school, I feel ashamed of myself.	3.05	1.17	0.34
RES2-	I would rather admit something I have done wrong than try to cover it up.	2.55	1.35	0.42
RES3-	I would rather be corrected, than left to do something wrong.	3.12	0.94	0.18 [#]
RES4-	If I have done something wrong, I'm always ready to take the consequences.	2.55	1.25	0.41
RES5-	I always find a good excuse if I haven't done my homework (-).	3.03	1.15	0.17 [#]
RES6-	I find I am often having to make excuses (-).	3.31	0.91	0.46
RES7-	I am ready to take responsibility for all my actions, no matter what.	2.62	1.29	0.54
RES8-	I always try to live up to my parents' trust.	2.62	1.40	0.46
RES9-	A feeling of guilt is worse even than severe punishment.	2.12	1.46	0.16 [#]
7. DEEP APPROACH (DAP):				
DAP1-	I try to relate ideas in one subject to those in others, whenever possible.	3.04	0.90	0.48
DAP2-	I generally try to understand things even when initially see rather difficult.	3.50	0.54	0.37
DAP3-	Often I ask myself questions about the things I hear in lessons or read in books.	2.97	1.06	0.55

(Continued)

SUB-SCALE/ITEM	QUESTION	MEAN	STDDEV	ITEM-TOT CORRELAT
DAP4-	I try to relate what I read to previous work.	2.74	1.25	0.43
DAP5-	I prefer to make my own notes when I can.	2.24	1.41	0.37
DAP6-	In trying to understand new ideas, I often try to relate them to real-life situations.	3.10	0.97	0.50
8. HOLIST STYLE (HOS):				
HOS1-	When I'm reading, the ideas sometimes produce vivid images in my mind.	3.07	1.12	0.32
HOS2-	I like to play around with ideas of my own, even if they don't get me very far.	2.81	1.23	0.31
HOS3-	I enjoy doing things where I can use my imagination or my own ideas.	3.03	1.23	0.46
HOS4-	I prefer teachers who use lots of examples, or their own experiences, to help us understand things.	3.51	0.82	0.59
HOS5-	I suppose I'm a bit too ready to jump to conclusions.	2.12	1.40	0.35
HOS6-	In written work I try to put over my own view whenever possible.	3.20	0.98	0.37
9. INTRINSIC MOTIVATION (IMO):				
IMO1-	I find some subjects so interesting that I would like to go on with them after I leave here.	2.89	1.19	0.55
IMO2-	Some of the work here is really exciting and gripping.	2.64	1.32	0.50
IMO3-	My main reason for studying is so that I can learn more about the subjects which really interest me.	2.70	1.36	0.44
IMO4-	I spend a good deal of my spare time finding out about interesting topics which have been discussed.	2.91	1.47	0.37
IMO5-	I am fascinated by some of the topics we meet in school work.	2.89	1.17	0.70
IMO6-	I get very enthusiastic about some of my school work.	2.70	1.36	0.45
10. SURFACE APPROACH (SAP):				
SAP1-	I find I have to rely on memorizing a good deal of what we have to learn.	2.79	1.19	0.34

(Continued)

SUB-SCALE/ITEM	QUESTION	MEAN	STDDEV	ITEM-TOTA CORRELATI
SAP2-	I don't really have time to think about the implications of what I have read.	1.82	1.40	0.61
SAP3-	The best way for me to understand what technical terms mean is to remember just the text-book definition.	1.97	1.51	0.51
SAP4-	I like to be told precisely what to do in essays or other set work.	3.15	1.12	0.36
SAP5-	I make my own notes only when the teacher tells me to.	1.91	1.53	0.38
SAP6-	Generally I read only what we are specifically told to read.	1.03	1.36	0.47
11. SERIALIST STYLE (SST):				
SST1-	I prefer to tackle each part of a topic or problem in order, working through it one step at a time.	3.12	0.83	0.72
SST2-	I'm more ready to follow well-tried approaches to problems than unfamiliar ones.	3.12	0.93	0.36
SST3-	I think it's important to look at problems cautiously and logically without relying on intuition.	2.12	1.36	0.35
SST4-	I prefer to stick to one approach to a problem until I'm absolutely sure it won't work.	2.06	1.64	0.40
SST5-	I prefer teachers who stick to the point and don't go off at a tangent.	2.85	1.44	0.40
SST6-	When I'm explaining something, I generally try to give a lot of detail.	1.91	1.47	0.55
12. INSTRUMENTAL MOTIVATION (INM):				
INM1-	I suppose I'm more interested in the qualifications I'll get, than in the subjects I'm taking.	2.18	1.51	0.53
INM2-	My main reason for studying is so that I'll be able to get a good job.	2.88	1.32	0.41
INM3-	When I work hard, it's only so that I can continue my education.	2.88	1.45	0.55

(Continued)

SUB-SCALE/ITEM	QUESTION	MEAN	STDDEV	ITEM-TOT CORRELAT
INM4-	When I work hard it's only because I don't want to let my parents down.	2.73	1.50	0.44
INM5-	I suppose I'm at school only because I don't to have any real choice about it.	1.44	1.29	0.42
INM6-	I work well only when the teacher puts me under a good deal of pressure.	2.18	1.61	0.45
13. FEAR OF FAILURE (FOF):				
FOF1-	In exams I tend to panic.	3.20	0.82	0.47
FOF2-	I worry a lot when teachers criticize my work.	2.52	1.44	0.41
FOF3-	I am always worrying that I will get behind with my work.	3.39	0.90	0.62
FOF4-	I never seem to be able to do things as well as I feel I could.	2.85	1.37	0.33
FOF5-	Other people always seem to be able to do things better than I can.	2.64	1.45	0.49
FOF6-	Worrying about school work often prevents me from sleeping.	2.27	1.68	0.47
14. STRATEGIC APPROACH (STR):				
STR1-	I'm very good at organizing my study time effectively.	1.40	1.35	0.39
STR2-	I very rarely require extra time to complete written work.	1.43	1.39	0.33
STR3-	I always organize my work very carefully.	2.57	1.24	0.59
STR4-	If I do something badly, I try to work out why, so that I can do better next time.	3.40	0.75	0.68
STR5-	If conditions aren't right for me to study, I always try to do something to change them.	3.26	0.97	0.56
STR6-	I plan my working time carefully to make the most of it.	2.07	1.45	0.51
15. HOPE FOR SUCCESS (HFS):				
HFS1-	I hate admitting defeat, even in trivial matters.	2.22	1.58	0.34
HFS2-	I enjoy competing with other pupils in school work.	2.81	1.28	0.54
HFS3-	It's important to me to do things better than other pupils, if I possibly can.	3.12	1.11	0.47

(Continued)

SUB-SCALE/ITEM	QUESTION	MEAN	STDDEV	ITEM-TOTA CORRELATI
HFS4-	If I want something badly, I don't mind really pushing to get it.	2.90	1.25	0.48
HFS5-	I feel tense before an exam, but that seems to make me work better during it.	2.52	1.41	0.26
HFS6-	I play any game to win, not just for the fun of it.	1.66	1.58	0.39
16. CONSCIENTIOUSNESS (COS):				
COS1-	If I have something to do, I feel it's worthwhile only if I do it well.	3.33	0.80	0.25
COS2-	I feel it's my duty to work hard at school.	3.03	1.03	0.35
COS3-	I don't mind working long hours to complete my work satisfactorily.	2.66	1.21	0.34
COS4-	When I've started a piece of work, I stick at it even if I'm finding it really hard.	2.52	1.42	0.45
COS5-	I take my work seriously, no matter what.	3.16	0.81	0.58
COS6-	Even when I'm tired, I try to finish everything I have to do.	2.36	1.44	0.35
II- LIFE ORIENTATION TEST:				
OPM1-	In uncertain times, I usually expect the best.	3.50	1.03	0.58
OPM2-	If something can go wrong for me, it will.	2.73	1.25	0.36
OPM3-	I always look on the bright side of things.	2.52	1.36	0.29
OPM4-	I'm always optimistic about my future.	3.13	1.14	0.33
OPM5-	I hardly ever expect things to go my way.	3.00	1.12	0.34
OPM6-	Things never work out the way I want them to.	3.50	1.03	0.43
OPM7-	I'm a believer in the idea that "every cloud has a silver lining".	2.80	1.27	0.40
OPM8-	I rarely count on good things happening to me.	1.38	1.3	0.08 [#]

(Continued)

III - ROTTER'S INTERNAL-EXTERNAL LOCUS OF CONTROL

ITEM	QUESTION	MEAN	STDDEV	ITEM-TOT CORRELAT
EXC1-	A. Many of the unhappy things in people's lives are partly due to bad luck.			
	B. People's misfortunes result from the mistakes they make.	1.43	0.50	0.28
EXC2-	A. One of the major reasons why we have wars is because people don't have enough interest in politics.			
	B. There will always be wars, no matter how hard people try to prevent them.	1.83	0.45	0.10 [#]
EXC3-	A. In the long run people get the respect they deserve in this world.			
	B. Unfortunately, an individual's worth often passes unrecognised no matter how hard he tries.	1.88	0.34	0.35
EXC4-	A. The idea that teachers are unfair to students is nonsense.			
	B. Most students don't realize the extend to which their grades are influenced by accidental happenings.	1.75	0.44	0.24
EXC5-	A. Without the right breaks one cannot be an effective leader.			
	B. Capable people who fail to become leaders have not taken advantage of their opportunities.	1.47	0.50	0.47
EXC6-	A. No matter how hard you try some people just don't like you.			
	B. People who can't get others to like them don't understand how to get along with others.	1.40	0.49	0.47
EXC7-	A. I have often found that what is going to happen will happen.			
	B. Trusting to fate has never turned out as well for me as making a decision to take a definite course of action.	1.19	0.39	0.37
EXC8-	A. In the case of the well prepared student there is rarely if ever such a thing as an unfair test.			
	B. Many times exam questions tend to be so unrelated to course work that studying is really useless.	1.30	0.46	0.37

(Continued)

ITEM	QUESTION	MEAN	STDDEV	ITEM-TOT CORRELAT
EXC9-	A. Becoming a success is a matter of hard work, luck has little or nothing to do with it.			
	B. Getting a good job depends mainly on being in the right place at the right time.	1.23	0.43	0.32
EXC10-	A. The average citizen can have an influence in government decisions.			
	B. This world is run by the few people in power, and there is not much the little guy can do about it.	1.67	0.48	0.32
EXC11-	A. When I make plans, I am almost certain that I can make them work.			
	B. It is not always wise to plan too far ahead because many things turn out to be a matter of good or bad fortune anyhow.	1.62	0.49	0.25
EXC12-	A. In my case getting what I want has little or nothing to do with luck.			
	B. Many times we might just as well decide what to do by flipping a coin.	1.54	0.56	0.08 [#]
EXC13-	A. Who gets to be the boss often depends on who was lucky enough to be in the right place.			
	B. Getting people to do the right thing depends upon ability; luck has little or nothing to do with it.	1.13	0.34	0.26
EXC14-	A. As far as world affairs are concerned, most of us are the victims of forces we can neither understand, nor control.	1.82	0.39	0.33
	B. By taking an active part in political and social affairs the people can control world events.			
EXC15-	A. Most people can't realize the extent to which their lives are controlled by accidental happenings.	1.85	0.41	0.32
	B. There really is no such thing as "luck".			
EXC16-	A. It is hard to know whether or not a person really likes you.	1.62	0.52	0.29
	B. How many friends you have depends upon how nice a person you are.			

(Continued)

ITEM	QUESTION	MEAN	STDDEV	ITEM-TOTA CORRELATI
EXC17-	A. In the long run the bad things that happen to us are balanced by the good ones.	1.82	0.38	0.32
	B. Most misfortunes are the result of lack of ability, ignorance, laziness, or all three.			
EXC18-	A. With enough effort we can wipe out political corruption.			
	B. It is difficult for people to have much control over the things politicians do in office.	1.68	0.47	0.24
EXC19-	A. Sometimes I can't understand how teachers arrive at the grades they give.	1.28	0.49	0.28
	B. There is a direct connection between how hard I study and the grades I get.			
EXC20-	A. Many times I feel that I have little influence over the things that happen to me.	1.68	0.47	0.35
	B. It is impossible for me to believe that chance or luck plays an important role in life.			
EXC21-	A. People are lonely because they don't try to be friendly.			
	B. There's not much use in trying too hard to please people, if they like you, they like you.	1.47	0.50	0.31
EXC22-	A. What happen to me is my own doing.			
	B. Sometimes I feel that I don't have enough control over the direction my life is taking.	1.62	0.49	-0.02 [
EXC23-	A. Most of the time I can't understand why politicians behave the way they do.	1.67	0.48	0.38
	B. In the long run the people are responsible for bad government on a national as well as on a local level.			

KEYS: 1. [*] marked indicate items to be deleted in main study.
2. (-) marked at the end of some questions in the School And School Work inventory indicate the negatively worded items which were reverse-scored.
3. The underlined letter (A or B) in the Rotter's I-E Locus of Control inventory indicate 'external' items.

APPENDIX 3E

THE BREAKDOWN OF ACHIEVEMENT
(RESULTS OF SPM) BY ETHNICITY, ACADEMIC STREAM,
GENDER, RESIDENTIAL STATUS AND RESIDENCY.

	N	PERCENTAGE, (N) IN GRADE I	PERCENTAGE, (N) IN GRADES II & III	MEAN*	MEDIAN
A. *By Ethnicity:*					
CHINESE	315	93.3% (294)	6.7% (21)	17.1	18.0
OTHERS	18	55.6% (10)	44.4% (8)	25.3	26.0
MELANAUS	35	40.0% (14)	60.0% (21)	26.5	27.0
BIDAYUHS	139	39.6% (55)	60.45 (84)	26.2	27.0
IBANS	74	28.4% (21)	71.6% (53)	27.8	27.5
MALAYS	344	27.3% (94)	72.7% (250)	27.9	28.5
B. *By Academic Stream*					
SCIENCE	332	77.1% (256)	22.9% (76)	19.3	19.0
ARTS	593	39.1% (232)	60.9% (361)	26.4	27.0
C. *By Gender*:					
GIRLS	562	53.0% (298)	47.0% (264)	23.8	24.0
BOYS	363	52.3% (190)	47.7% (173)	23.9	24.0
D. *By Residential Status*:					
DAY SCHOLARS	614	62.4% (383)	37.6% (231)	22.4	22.0
BOARDERS	311	33.8% (105)	66.2% (206)	26.8	27.0
E. *By Residency*:					
URBAN	548	64.6% (354)	35.4% (194)	21.9	22.0
RURAL	377	35.4% (133)	64.6% (244)	26.6	27.0

* Low mean scores indicate High achievement levels.

APPENDIX 4A

Values of 't' against Degree of Freedom for 0.05 Significance and 0.01 Significance Levels.

Critical values of t[a]

For any given *df*, the table shows the values of *t* corresponding to various levels of probability. Obtained *t* is significant at a given level if it is equal to or *greater than* the value shown in the table.

	LEVEL OF SIGNIFICANCE FOR ONE-TAILED TEST					
	.10	.05	.025	.01	.005	.0005
	LEVEL OF SIGNIFICANCE FOR TWO-TAILED TEST					
df	.20	.10	.05	.02	.01	.001
1	3.078	6.314	12.706	31.821	63.657	636.619
2	1.886	2.920	4.303	6.965	9.925	31.598
3	1.638	2.353	3.182	4.541	5.841	12.941
4	1.533	2.132	2.776	3.747	4.604	8.610
5	1.476	2.015	2.571	3.365	4.032	6.859
6	1.440	1.943	2.447	3.143	3.707	5.959
7	1.415	1.895	2.365	2.998	3.499	5.405
8	1.397	1.860	2.306	2.896	3.355	5.041
9	1.383	1.833	2.262	2.821	3.250	4.781
10	1.372	1.812	2.228	2.764	3.169	4.587
11	1.363	1.796	2.201	2.718	3.106	4.437
12	1.356	1.782	2.179	2.681	3.055	4.318
13	1.350	1.771	2.160	2.650	3.012	4.221
14	1.345	1.761	2.145	2.624	2.977	4.140
15	1.341	1.753	2.131	2.602	2.947	4.073
16	1.337	1.746	2.120	2.583	2.921	4.015
17	1.333	1.740	2.110	2.567	2.898	3.965
18	1.330	1.734	2.101	2.552	2.878	3.922
19	1.328	1.729	2.093	2.539	2.861	3.883
20	1.325	1.725	2.086	2.528	2.845	3.850
21	1.323	1.721	2.080	2.518	2.831	3.819
22	1.321	1.717	2.074	2.508	2.819	3.792
23	1.319	1.714	2.069	2.500	2.807	3.767
24	1.318	1.711	2.064	2.492	2.797	3.745
25	1.316	1.708	2.060	2.485	2.787	3.725
26	1.315	1.706	2.056	2.479	2.779	3.707
27	1.314	1.703	2.052	2.473	2.771	3.690
28	1.313	1.701	2.048	2.467	2.763	3.674
29	1.311	1.699	2.045	2.462	2.756	3.659
30	1.310	1.697	2.042	2.457	2.750	3.646
40	1.303	1.684	2.021	2.423	2.704	3.551
60	1.296	1.671	2.000	2.390	2.660	3.460
120	1.289	1.658	1.980	2.358	2.617	3.373
∞	1.282	1.645	1.960	2.326	2.576	3.291

Reproduced from R.M. Kiplan, Basics statistics for the behavioral sciences, Allyn and Bacon Inc., 1987.

APPENDIX 4B

Values of Correlation Coefficient Required for Significance at 0.05 and 0.01 Levels for Samples of Various Size (N)

Critical values of r for $\alpha = .05$ and $\alpha = .01$ *(two-tailed test).*		
N	$\alpha = .05$	$\alpha = .01$
10	.632	.765
11	.602	.735
12	.576	.708
13	.553	.684
14	.532	.661
15	.514	.641
16	.497	.623
17	.482	.606
18	.468	.590
19	.456	.575
20	.444	.561
21	.433	.549
22	.423	.537
23	.413	.526
24	.404	.515
25	.396	.505
26	.388	.496
27	.381	.487
28	.374	.479
29	.367	.471
30	.361	.463
32	.349	.449
34	.339	.436
36	.329	.424
38	.320	.413
40	.312	.403
42	.304	.393
44	.297	.384
46	.291	.376
48	.284	.368
50	.279	.361
55	.265	.345
60	.254	.330
65	.244	.317
70	.235	.306
75	.227	.296
80	.220	.287
100	.197	.256
125	.176	.230
150	.161	.210
200	.139	.182
400	.098	.128
1000	.062	.081

Reproduced from A.C. Crocker, Statistics for the teacher or how to put figures in their place, Penguin Books, 1969.

APPENDIX 4C

Summary Statistics of Responses to School and School Work Inventory, Rotter's I-E Locus of Control Inventory and Life Orientation Test Inventory.

INVENTORY	SCALE NAME	N OF ITEM	SCALE RANGE Min.	Max.	MEAN	SD
School and School Work	1. Warmth	6	6	30	22.67	4.99
	2. Sociability	6	6	30	21.95	4.65
	3. Competence	6	6	30	21.99	5.01
	4. Interest	6	6	30	23.24	4.86
	5. Responsibility	6	6	30	23.66	4.11
	6. Compliance	6	6	30	23.14	4.83
	7. Deep Approach	6	6	30	23.55	4.20
	8. Holist Style	6	6	30	23.63	4.37
	9. Intrinsic Motivation	6	6	30	22.22	5.34
	10. Surface Approach	6	6	30	19.48	5.65
	11. Serialist Style	6	6	30	22.96	4.64
	12. Instrumental Motivation	6	6	30	19.86	5.95
	13. Fear of Failure	6	6	30	22.19	4.67
	14. Strategic Approach	6	6	30	21.05	4.49
	15. Hope for Success	6	6	30	22.56	4.86
	16. Conscientiousness	6	6	30	24.18	4.42
Rotter's I-E Locus of Control	(internal-external statements)	14	1	14	6.81	2.56
Life Orientation Test	(optimism-pessimism statements)	7	7	35	26.03	3.55

SD- Standard Deviation