THE UNIVERSITY OF HULL

A CRITICAL STUDY OF VARIOUS METHODS USED TO IDENTIFY INTELLECTUALLY GIFTED MALAY CHILDREN

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SUMMARY

A CRITICAL STUDY OF VARIOUS METHODS USED TO IDENTIFY INTELLECTUALLY GIFTED MALAY CHILDREN

In chapter 1, the discussion is focussed on the underlying reason for the introduction of the education programme for the gifted in Malaysia and the need to undertake this study. The review of literature on the concept of giftedness, procedures and the measures used to identify intellectually gifted is presented in chapter 2.

Almost all measures used to identify intellectually gifted have been developed in the USA and the UK, so,they have had to be translated to Malay and pretested. Thus, in chapter 3, the stability and to some extend the validity of the Malay version of these measures are presented. The Malay version measures are found to have similar ability as the original version.

Since the criterion of intellectual giftedness is high IQ, an individual intelligence test has to be administered and this will limit the number and the representativeness of the sample. The possibility of screening the respondents and the procedure used to collect the data is detailed in chapter 4. The descriptive statistics that served as a basis for further analyses are presented in chapter 5.

The effectiveness of the current or conventional procedure of using a grade from a public achievement test and categorization of test score is evaluated in chapter 6. Having found that the conventional procedure is not effective, multiple regression and discriminant function analyses are conducted to find the predictor(s) of giftedness and its the effectiveness especially in term of reducing false positives and false negatives. On the basis of these findings, presented in Chapter 7, a multi-stage procedure of identifying intellectually gifted Malay children can be developed by education authorities in Malaysia.

In chapter 8, the main findings of the study is summarized and the establishment of longitudinal validation study is proposed.

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CONTENTS

FIGURES/GRAPHS/TABLES

a. Figures

b. Graphs

c. Tables

ABBREVIATIONS

HMI	-	Her Majesty Inspectorate of School
KBSR	-	New Curriculum for the Primary School [Kurikulum Baru Sekolah Rendah]
MARA	-	Council for People Trust [Majlis Amanah Rakyat]
MRSM	-	MARA Junior Science College [Maktab Rendah Sains Mara]
PIQP	-	Predicted IQ based on Parent's Rating
PIQS	-	Predicted IQ based on SFT
PIQT	-	Predicted IQ based on SRBCSS
PIQU	-	Predicted IQ based on UPSR
PIQW	-	Predicted IQ based on WISC-R short form
SD	-	Standard Deviation
SEM	-	Standard Error of Measurement
SFT	-	School Failure Tolerance
Aff	-	Affect
Act	-	Action
PD	-	Preferred Difficulty
SPM	-	Standard Progressive Matrices
SRBCSS	-	Scale for Rating Behavioral Characteristics of Superior Children
UK	-	United Kingdom
UPSR	-	Primary School Assessment Test [Ujian Penilaian Sekolah Rendah]
USA	-	United States of America
WISC-R	-	Weschler Intelligence Scale for Children (Revised)
Arit	-	Arithmetic
BD	-	Block Design
Cod	-	Coding
Com	-	Comprehension
Info	-	Information
OA	-	Object Assembly
PA	-	Picture Arrangement
PC	-	Picture Completion
Sim	-	Similarity
Voc	-	Vocabulary

CHAPTER 1

THE NEED TO IDENTIFY INTELLECTUALLY GIFTED MALAY CHILDREN AND THE INTRODUCTION TO THE RESEARCH STUDY

1.0 Preamble

The main focus of research in psychology is studying individual differences. In human beings, the findings have led to the recognition of exceptionality in human behaviours. In terms of ability to learn, exceptionality is in a continuum ranging from those who are mentally handicapped to those who are gifted. Both need a different type of educational programme. Children who are mentally handicapped need compensatory education, while gifted children need enrichment and accelerated education.

Although many people realize the need to provide special education for the gifted, they shun the idea for it smacks of elitism. In the United Kingdom, the HMI in their report entitled `Gifted Children in Middle and Comprehensive Secondary Schools (1977)', stated that the concept of giftedness had not even been widely considered. In this report, the HMI also highlighted the fact that staff in one of the schools declined to identify gifted and talented children because they claimed that it is wrong to differentiate and categorize children. The HMI were also of the opinion that teachers in the UK were more in favour of

special treatment for the educationally disabled than for the gifted and talented.

Another reason that led to the abandoning of special education for the gifted was a popular belief that no matter what the circumstance, the gifted will achieve. This belief is contrary to the research findings that have shown that many gifted children are performing far below their intellectual potential. Marland (1972) estimated that as many as 15-30% of American high school dropouts were gifted and talented (Lemov, 1979). In the United Kingdom, the ablest children are also operating well below their ability in school (Painter, 1976).

The search for gifted and talented children has been intensified in the last two decades. The motive behind the renewed interest in the education of the gifted varies from nation to nation. In a developed country, such as the USA, the launching of Sputnik by their Russian rivals stimulated the interest among politicians and educators to set up gifted educational programmes so as to maintain superiority. Developing countries such as Malaysia tend to promote educational programmes for the intellectually gifted for economic reasons. With the depletion of natural resources (tin, timber, rubber and petroleum) and poor commodity demand, Malaysia has had to develop human resources as an alternative for survival.

1.1 The Educational System in Malaysia: A Brief Historical Review

Malaysia (formerly known as Malaya) is a multiracial country, whose population in 1990 was estimated to be made up of about 62% Indigenous Malays, 29% Chinese and 8% Indians. A historical review on the formation of this multiracial society has been widely documented (see Chelliah, 1947).

In short, the British, after obtaining control over the affairs of the Malay states through the Pangkor Engagement of 1874 from the Malay Rulers, brought the Chinese and the Indians to develop natural resources for economic growth. They are now to be found in the more economically developed parts of the country. The indigenous Malays, who were geographically secluded in their traditional villages, remained detached from all economic progress and thus failed to gain economically from the colonial experience.

Before World War Two, the main concern of the Colonial government was just to exploit natural resources for the Crown's coffers. The Colonial authorities took little if any controlling interest in the educational system at that time. The Chinese and the Indian immigrants built their own schools; imported a curriculum from their homeland and engaged teachers from their respective communities. After World War Two, there were three types of vernacular schools;

Malay, Chinese and Tamil. The nationalistic movements, in the mainland of China and among the Malays, forced the Colonial government to control the expansion of vernacular schools.

Independence was achieved in 1957 and the education system of newly independent Malaysia is mainly the result of the implementation of the Education Act of 1961. This Act, was not something devised in a hurry to fulfil the spirit of independence. It was moulded and honed into its present form through a series of committee investigations and reports namely; The Barnes Report 1951, The Fenn-Wu Report 1951, The Education Ordinance 1952, The Razak Report 1956 and The Rahman Talib Report 1960.

The Barnes Report, published in 1951, was the Colonial government's effort to improve Malay education in response to the demand from the nationalistic movement following the Japanese Occupation during World War Two. The covert aim of establishing the committee was to control the expansion of the other vernacular schools particularly the Chinese schools following nationalistic and socialist movements in the mainland of China. The committee, chaired by L.J. Barnes of Oxford University, highlighted the need for change to the whole system of education in order to improve educational opportunities for the benefit of the Malays. It proposed the setting up of inter-racial bilingual National Schools with either English or Malay as the medium of instruction. The Barnes Report also suggested that vernacular schools in

Malay, Chinese and Tamil should be gradually transformed into National Schools.

The Chinese and the Indians perceived the Barnes Report to be a dangerous threat to their cultures and customs. They sought cultural maintenance and protection through the continued use of Chinese and Tamil as the medium of instruction in their respective vernacular schools. The fierce opposition to the Barnes recommendations, especially from the Chinese, forced the Colonial government to establish another committee on Chinese education. In 1951, the proposed committee was set up and chaired jointly by Dr. Fenn of China and Dr. Wu from the United Nations. The Fenn-Wu Report argued that vernacular Chinese schools should be preserved and strengthened. As the Chinese had opposed the Barnes Report, so the Malays also expressed their dissatisfaction with the Fenn-Wu Report. The Malays alleged that the immigrant communities had no intention of being identified with the local population.

The vigorous debate that followed the publication of these two Reports prompted the British Colonial authority to form a Central Advisory Committee on Education. The main task of this committee was to reconcile the conflicting positions indicated by the Barnes and Fenn-Wu reports. There was the Education Ordinance of 1952 which stated that Malay vernacular schools should become bilingual with English as an

additional medium of instruction, and other vernacular schools become tri-lingual with English and Malay as additional media of instruction. The proposed recommendation was not implemented as Malaya was on the brink of independence.

Prior to Independence, the interim Cabinet appointed the first Minister of Education to examine the existing policy on education and to recommend any alterations or adaptations that were necessary with a view to establishing a national education system for the proposed independent state of Malaya. Keeping in mind that Malay was accepted as the official language in the Constitution, the committee had to make recommendations that would satisfy the needs of the people, and to promote cultural, social, economic and political development.

As a foundation for National Education Policy, the Razak Report, published in 1956, proposed that Malay and English should be compulsory subjects in all schools. The Report also contained a recommendation for centralization through establishing a Malayan outlook by means of common curricula, syllabuses and timetables. The Razak Report formed the basis for the formulation of an Education Ordinance in 1957 for the newly independent state of Malaya.

After Independence, the Government felt that an Education Act had to be passed by Parliament so that the

Ministry of Education would have wider powers to regulate and enforce educational practices in Malaya. Before drafting the Act, the government set up another committee to review educational policy with the intention of producing a more thorough-going policy on education. The government then was of the opinion that through a sound educational policy, more effective national development and progress could take place. The committee's report, known as the Rahman Talib Report published in 1960, introduced streaming and vocational education.

The Rahman Talib Report together with the earlier reports discussed above, namely Barnes, Fenn-Wu and Razak reports, jointly formed the basis for the Education Act of 1961. What is evident from the formulation of the Education Act of 1961 is, that it was not easy to cater for the demands of the different ethnic groups. Although this Act is currently under review, it has existed as the guiding framework for the education of Malaysian children for more than thirty years.

The public announcement made by the Minister of Education in 1990 to review Education Act of 1961 is in-line with the 173 recommendations proposed by the Cabinet Report of 1979. The Cabinet Report was produced by the committee appointed by the Cabinet in 1977 to review the implementation of National Education Policy. According to Professor Awang Had Salleh, the Education Adviser to the Ministry of Education, on 24th February, 1990, the proposed Education Act

will include some innovations: the inclusion of provision for the education of the gifted; and the improvement of the quality of educational output.

The conclusion that can be drawn from the historical development of the education system of Malaysia is that the need to preserve the mother-tongue languages among ethnic groups had to be recognised. The prime concerns of both the Ministry or the Government were with satisfying themselves that the allocation of educational provision and resources reflected the ethnic composition of the country. As a newly independent state, Malaya was in need of trained and skilled manpower to replace expatriates and to exploit the abundance of natural resources. The issue of 'quality' and appropriateness of educational provision at that time was not properly addressed.

After more than three decades of independence, there has been a shift of focus from mere quantitative aspects to issues relating to quality and appropriateness of educational provision. This is evidenced in the amendment drawn up in 1990, to the Education Act. To make Malaysia a progressive and competitive nation, the Ministry of Education has had to undertake the task of designing educational policy to contribute to the achievement of the Prime Minister's aim, Vision 2020*.

*Vision 2020 is the Prime Minister's master plan to make Malaysia a progressive and competitive nation. See Mahathir M. (1991) for details.

1.2 The Education for the Bright Malay Children.

The following is a review of educational practices that can be identified as the education of the gifted among Malay children in Malaysia both before and after Independence.

1.2.1 Before Independence.

The British Colonial Government introduced a formal educational system and the first school was built in 1890 in Kuala Lumpur. Elementary education was compulsory for Malay children. Initially, elementary education, with Malay as the medium of instruction, was for four years. After the Second World War, it was increased to six years to meet the demands of nationalistic movements resulting from the Japanese Occupation. Graduates from Malay elementary schools could only be expected to obtain jobs as low status village school teachers, lower rank members of the security forces and office boys or drivers in government administrative offices.

Secondary education was only accessible to the Chinese and some Indian immigrants, as schools were only built in major towns. As the Malays lived in the villages, they could not afford to pay the maintenance and school fees for their children. Furthermore, since the medium of instruction was English, the graduates from the Malay primary schools were deprived of secondary education.

There were, then, no educational programmes for the intellectually gifted. However, there were a few common educational practices regarding the intellectually gifted. School principals in Malaya used their discretion to allow academically bright students to skip one or two classes. They could also employ them as a `teacher' to teach other children. Not all bright children had this privilege, because some teachers were not in favour of this practice, since they believed it to be detrimental to the children's social and emotional development (Chiam, 1979).

In 1905, the British Colonial Government established the Malay College in Kuala Kangsar. This was the first fully residential secondary school which used English as the medium of instruction for Malay boys. Initially it was meant to cater for the need to provide formal education for the Malay Ruler's children with a few 'bright' children selected from the common Malays. Since the ruling classes preferred to send their children to Britain, from its inception, the number of children at the Malay College in Kuala Kangsar from the non-ruling classes was greater. Later, another two fully residential schools for Malay girls were established. The reasons for the establishment of these schools were similar to those for the Malay College.

Academically, almost all students from these residential schools graduated with flying colours in public examinations. Most of them were awarded scholarships and sent

to Great Britain to further their studies. They were recruited, on their return to Malaya, to important positions in the Colonial Government. When Malaya gained her independence, the graduates from this school automatically formed a nucleus of technocrats and replaced the expatriates.

1.2.2 After Independence.

Immediately after independence, the first Minister of Education officially introduced express classes for bright children. Thus, 'bright children' in any National or Vernacular school could complete their primary education in less than six years. In the absence of any guidelines, teachers were again entrusted to identify these children.

With the introduction of Malay as the medium of instruction in 1970, teachers had much to master and retraining courses to attend. So as a result of extra pressure and workload caused by the change in the medium of instruction, express classes did not survive into the post 1970 era. As an official language in the Constitution, Malay was perceived by the government to be a vehicle for achieving national unity. Proficiency in Malay was stressed not only among school children but also among school teachers. From 1970, school children must have at least a Pass in Malay to obtain any school certificate. Teachers must have a Pass in Malay at Sijil Pelajaran Malaysia or SPM (equivalent to GCE `O') for them to be tenured.

The year 1970 was a significant year in Malaysian history. Following a racial riot after the general election in 1969, there were calls from the nation for serious attention to be given to the design of policies that would ensure that such an incident would not recur. Many studies have been conducted to investigate the conditions that caused the outbreak of racial violence. The government believed that general feelings of dissatisfaction, primarily among the Malays, was the major cause, as a result of their not sharing the economic prosperity (Goh, 1972).

To rectify this problem, an overarching New Economic Policy (NEP) was launched in 1970. The main objectives of the NEP were to eradicate poverty among all races, particularly the ethnic Malays. The 1970 census indicated that 42 percent of Malay households were living below the poverty line, while among the immigrant Chinese and Indians the figures were 10 percent and 6 percent respectively. There was concern about the gross ethnic imbalance in the membership of professional groups. The Malays, who constituted over 60% of Malaysia's population in 1970 held only about 5% of posts as Registered Professionals, as shown in Table 1.1.

Table 1.1

Malaysia: Membership of Registered Professionals by Ethnic Group in 1970

Profession	Malay		Chinese		Indian		Others	
	N	%	N	%	N	%	N	%
Architects	12	4.3	224	80.9	4	1.4	37	13.4
Accountants	40	6.8	387	65.4	47	7.9	118	19.9
Engineers	66	7.3	643	71.0	122	13.5	75	8.3
Dentists	20	3.1	579	89.1	33	5.1	18	2.8
Doctors	79	3.7	954	44.8	857	40.2	241	11.3
Vet. Surgeons	8	40.0	6	30.0	3	15.0	3	15.0
Total	225	4.9	2793	61.0	1066	23.3	492	10.8

Source: First Malaysia Plan 1970-75.

Education has been given several crucial tasks in response to the prevailing needs of the time. Seen as a key instrument for providing skilled and professional personnel, education in Malaysia has also always been regarded as a means of forging national unity and identity. With the New Economic Policy, education has also become a means for social restructuring and the eradication of poverty.

The success of the residential school in producing Malay technocrats in the past, particularly before independence and the racial riot, has led the government to build more residential schools. Before the racial riots of 1969, there were nine residential schools in Malaysia. From 1970 to date, the Ministry of Education has established another 23 residential schools. They are named as 'Sekolah Menengah Sains' or 'Science Secondary Schools' and have been built in every state.

An independent agency established by the government, 'Majlis Amanah Rakyat' or MARA, set up another 12 residential schools. They are known as MARA Junior Science Colleges (MRSM). These schools were set up to cater for bright Malay students from the rural poor. The Ministry's residential school has a provision for a 10 percent intake for non Malays (including the Chinese and the Indians) but this provision is not fully realized due to a lack of poor but bright non-Malay children.

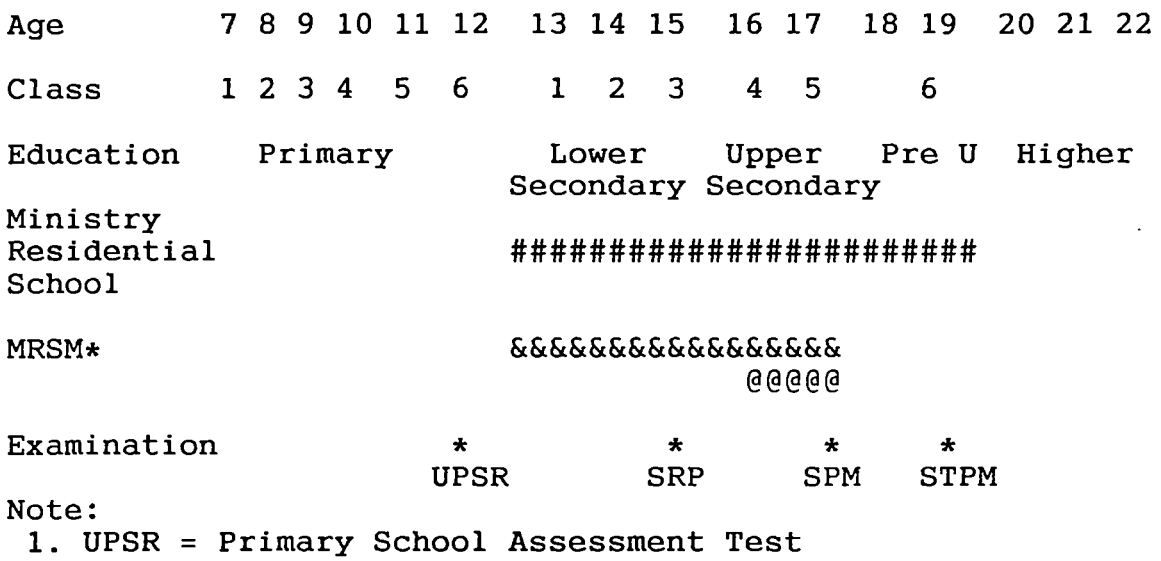
In 1989, the total enrolment of residential schools under the Ministry of Education was 18,315 which is slightly more than 5 percent of the total enrolment in the secondary school. Many more such schools are being planned in the coming years. Besides the Ministry of Education and other government agencies, private corporations are also keen to build residential schools to cater for the demand for such education. The Deputy Director General of MARA announced, in a press statement on 8th. May 1992, that another 40 MARA Junior Colleges are going to be built in the next five years (Utusan Malaysia, 8th May 1992, p11).

From 1970 to 1988, the criterion for the intake into these schools (residential schools under Ministry of Education and MRSM) is solely on the basis of achievement in the primary school assessment test or UPSR (Please refer to Figure 1.1: Education System in Malaysia). Initially, the

minimum qualification needed is 3 grade A's and 2 grade B's from the five subjects. Lately, due to the growing number of pupils who are eligible, only those with all grade A's are accepted and priority is given to those who come from poorer families. In 1988, the Ministry introduced a Residential School Entrance Test. The Residential School Entrance Test score is not reported but it is only used for final selection.

Figure 1.1

EDUCATION SYSTEM IN MALAYSIA



Note:
1. UPSR = Primary School Assessment Test
   SRP = Lower Secondary Certificate
   SPM = Malaysia Education Certificate
   STPM = Higher School Certificate
2. MRSM - &&&& 1970 to 1987
   @@@@ from 1988

As in Figure 1.1, in 1988, MARA Junior Science Colleges no longer admitted students after primary six. Although no specific reasons were provided by MARA, it was believed that the number of pupils performing below

expectation is increasing alarmingly. MARA Junior Science Colleges now select their candidates among Year Three secondary school students based on the overall and mathematics achievement in SRP or the Lower Certificate Examination.

In 1977, a committee to study the implementation of educational policy was set up and chaired by the Minister of Education. The Report was published two years later. It was entitled 'The Cabinet Report on The Implementation of Educational Policy' and was also popularly referred as the Cabinet Report of 1979. The Cabinet Report contains 173 recommendations for the Ministry of Education to achieve quality in the education system after two decades of implementing the National Education Policy. There are five recommendations to improve the education for the handicapped but the Report made no clear recommendation on the education of the gifted.

In-line with the recommendations proposed by the Cabinet Report, the Ministry of Education revised the school curriculum. In primary schools, this change was implemented in 1983 as KBSR or, 'Kurikulum Baru Sekolah Rendah'. This curriculum which emphasizes the three basic skills of reading, writing and arithmetic, commonly referred to as the 3'Rs, has a provision to allow a `bright' child to complete his/her primary education in less than six years. At the end

of the primary phase, every pupil has to sit a public examination which is known as 'Ujian Pencapaian Sekolah Rendah' or UPSR.

Before the implementation of the new curriculum for the primary schools (KBSR), a nationwide study on 'Levels of Achievement of Primary School Pupils in Malaysia' was conducted by the Curriculum Development Centre of the Ministry of Education in 1980. The findings of this study established conclusively the unsatisfactory levels of achievement among primary school children in rural areas. The study also highlighted the increasing attention given by parents, teachers, pupils and schools to the Primary School Assessment Examination. The priority was for pupils to excel in this examination. To ensure their children performed well, urban parents generally engaged private tutors for their children, or at least sent their children for extra 'tuition classes'. Urban parents were also demanding that their children's teachers should devote all available resources, to cram facts and information, and to train their children to answer multiple-choice questions. This practice rendered less effective the government's effort of providing equality of educational opportunity through standardized curricula and schools, since disadvantaged children in the rural areas could not afford the luxury of extra resources, personal tutors or tuition classes and coaching enjoyed by their urban counterparts.

The aims of KBSR, as stated in its basic document, are, among others, to provide equal opportunity to every pupil to acquire basic skills, knowledge, values and attitudes. At the end of six years, the children sit for UPSR. From a close scrutiny of the 1988 results from one of the districts in Selangor (Table 1.2), it is obvious that rural children do not perform as well as urban children.

Table 1.2

Performance of Rural and Urban Pupils in UPSR in the District of Klang, Selangor

	Rural		Urban	
	1983	1988	1983	1988
Candidates*	2229	2664	4909	5623
Number passed	517	980	1660	2561
% pass	23.2%	36.8%	33.8%	45.6%
Pass with 5A's	22	77	153	412
% 5A's	1%	2.9%	3.1%	7.3%

*includes non-Malays

Source: Sulaiman et.al., 1990 p48

Note: 1983 - the last result for Standard Five assessment under the old curriculum
1988 - the first UPSR under KBSR

There is still, after 4 years, a wide disparity of achievement between rural and urban pupils especially in English and Mathematics (Sharipah and Azizah, 1991). The deteriorating school physical facilities that led to low

morale among teaching staff (Nazaruddin, Kamariah and Abd Majid; 1989), was another explanation why rural Malay children, still lagged behind in all subjects.

1.3 Rationale for the study.

The Education Act, passed in the year 1961 only contains provision for the educational programmes for the mentally retarded and physically handicapped. Thus, the Special Education Unit that was set up in the Ministry of Education exists just to plan and to monitor the needs of these children. The gifted are left to fend for themselves as this Unit never considered education for the gifted to be a part its responsibility.

In his keynote address to a Seminar on Education for the Gifted, on 24th February 1990, at the University of Malaya, Professor Awang Had Salleh, Education Advisor to the Ministry of Education, indicated that the task of providing education for the gifted should be on the basis of the present residential schools. MARA's Chairman, in his exclusive interview with a local newspaper 'Utusan Malaysia' on the 14th November 1991, announced MARA's plan to convert one of the MRSM for pupils of high intelligence so that MARA will produce at least 1000 gifted prodigies by the year 2020, in-line with the Prime Minister's Vision 2020.

Despite some criticisms levelled against the residential schools in certain quarters (Sharipah and Noran, 1990), the Government is still convinced that the residential school can be instrumental in developing and preparing Malays to achieve the objectives of the NEP. This is evident from the fact that all Malaysia Plans (from the First to the Fifth Malaysia Plan covering the years 1970 to 1990) have highlighted the need to expand these schools. Special allocations, by the Ministry of Education and MARA, for the development of these schools were clearly specified.

Following racial riots in 1969, a National Economic Plan (NEP) covering the period of 1971-90 was launched. This has now come to an end. After almost 15 years of implementing the NEP, by 1984, only 21 percent of registered professionals were Malays (Table 1.3). The Ministry of Education officials realized that a comprehensive action plan was needed in order to achieve a situation where 60% of Malays were engaged in all economic activities, thus reflecting the national population composition. Between 1970 and 1984, despite government efforts to achieve an overall 30 percent active participation in economic activities, Malays still lag behind in almost all economic activities.

Table 1.3

Malaysia: Membership of Registered Professionals
by Ethnic group, 1980 and 1984

Profession	1980				1984			
	Malay	Chinese	Indian	Others	Malay	Chinese	Indian	Others
Architects	57	461	7	8	103	539	7	9
(%)	*(10.7)*	*(86.5)*	*(1.3)*	*(1.5)*	*(15.6)*	*(15.6)*	*(1.1)*	*(1.4)*
Accountants	120	1261	126	122	286	2678	195	75
(%)	*(7.4)*	*(77.9)*	*(7.2)*	*(7.5)*	*(8.9)*	*(82.2)*	*(6.0)*	*(2.3)*
Engineers	1533	5904	526	321	3500	9294	752	335
(%)	*(18.5)*	*(71.3)*	*(6.3)*	*(3.9)*	*(25.2)*	*(67.0)*	*(5.4)*	*(2.4)*
Dentist*	117	744	241	30	194	444	286	33
(%)	*(10.3)*	*(65.7)*	*(21.3)*	*(2.7)*	*(20.3)*	*(46.4)*	*(29.9)*	*(3.4)*
Doctors	341	1531	467	172	753	1881	1745	126
(%)	*(9.7)*	*(43.7)*	*(41.7)*	*(4.9)*	*(16.7)*	*(41.8)*	*(38.7)*	*(4.9)*
Vet Surgeons	63	98	164	28	128	123	198	37
(%)	*(17.8)*	*(27.8)*	*(46.5)*	*(7.9)*	*(26.3)*	*(25.3)*	*(40.8)*	*(7.6)*
Total (%)	*14.9*	*63.5*	*17.4*	*4.2*	*21.0*	*61.9*	*14.5*	*2.6*

*Data for 1984 refers to Dentists I only. The total for 1984 is less than 1980 due to the exclusion of Dentist II category. Dentists I are professional dental surgeons, while Dentists II are registered but not considered as professionals.

Source: Fifth Malaysia Plan, p105

To date, there has been no study conducted to determine the accuracy of UPSR in selecting students for the residential schools. The selection of the students, based on their UPSR achievement, should indicate that he or she is among the top five percent of the population. In the later public examinations, they are also supposed to be among the top five percent.

In SPM (taken after 5 years in the Residential schools), for a student to be within the top 10%, he/she should have at least a grade 2 in each subject. Data in Table 1.4 shows that, apart from Islamic Studies, all mean grades were below 2.

Table 1.4
Mean Grades* of subjects in SPM for 1988
(Residential Schools)

Subjects	Candidates	mean grade*	passed(%)	No.failed
Malay Language	3802	2.75	100	-
English	3801	3.45	97	55
Islamic studies	3586	1.75	99	1
Geography	3562	4.49	98	75
Mathematic C	3789	3.43	98	90
Additional Maths	3310	6.11	75	811
Physics	2952	4.42	99	33
Chemistry	2952	4.25	96	109
Biology	2952	4.36	99	40
History	491	3.04	99	7
General Science	847	2.59	99	1
Accounting	440	5.45	85	68
Commerce	417	4.41	99	1

*Grade for each subject ranges from 1 (distinction) to 9 (fail).

Source:Residential Schools Unit, Ministry of Education

In the case of MRSM's 1990 SPM result (equivalent of GCE 'O' level in Britain), only 12.58 percent (375 out of 2982 candidates) were performing within the national top ten percent (Utusan Malaysia, 14 November 1991). Nearly 87 percent of MRSM's students failed to be in the top 10 percent after five years with MRSM.

There are various reasons which can be offered to explain the failure of residential school students to perform as expected (top 10 percent). They are various reasons being offered to explain this phenomenon. One common reason advanced was a regression to the mean. However, the data in Table 1.5 indicate that the residential schools have very significant advantages over ordinary schools. Thus, the performance in the SPM could not be attributed to the regression to the mean. It might be expected, not unreasonably, that pupils at such residential schools ought to perform very well.

Table 1.5

Learning Environment: Comparison between residential and ordinary secondary schools for the year 1989

Learning Environment	Residential	Ordinary
No. of student/class	25	35-45
Student/staff ratio	1:10	1:20
Graduate Teacher (%)	66	31

Source: Ministry of Education: Unpublished Educational Statistics of Malaysia, 1989

It is being suggested that the stability of UPSR as a criterion for selecting these students needs to be studied. Performance in UPSR seems not to be an effective criterion as a predictor of academic potential in later years of schooling (Noran and Sharipah, 1990). Since the residential schools have excellent learning facilities, Sharipah and Noran suggested that other measures that can reliably predict children's potential to learn, should be utilised in selecting students for these schools.

Using children's achievement in UPSR as a sole criterion for selecting candidates for residential schools, therefore, has to be supplemented by other measures so that economically poor and bright rural Malay candidates are not wrongfully eliminated. Experience in Great Britain indicated that the use of the 11+ examination as a criterion for streaming secondary students, had not only wrongly placed the children but also had adverse psychological effects (Kelly, 1990).

In order to be effective, other more reliable instruments to measure potential must be sought to replace or supplement UPSR. This is in-line with the intention of the Ministry of Education and MARA to convert the present residential schools into institutions for gifted children. MARA has openly stated (see Utusan Malaysia, 14 November, 1991) that the intellectually gifted may be defined mainly on the basis of IQ, intelligence tests are to be administered to select the candidates for these institutions.

There is a significant range of evidence which suggests that children with higher IQ benefited better from the experience of school than children with lower IQ (please refer to section 2.4.1 of chapter 2 for details). An individual test score, according to Butcher (1969), is an adequate predictor of scholastic achievement and yields a more useful picture of cognitive development. Vernon (1969) in his famous book `Intelligence and Cultural Environment', stated that intelligence tests are a better estimate of potentiality than other measures of achievement. Later Vernon added that the main usefulness of an intelligence test score is to predict educability or trainability particularly in scientific and technological disciplines (the correlation between IQ and achievement in science is found to be higher than achievement in arts). The residential schools were established to produce Malay scientists and professionals. Therefore, based on these findings, the candidates for these schools have to selected based on the IQ score.

It should be borne in mind that the cost per residential school student is five times that of an ordinary school student (Ministry of Education Financial Statistics, 1970-1990). In order to enhance the accountability of residential schools and to determine the stability of UPSR and other reliable measures, there needs to be research such as a longitudinal study to generate appropriate data.

1.4 Statement of Research Problem

Under the present review of the 1961 Education Act, it is anticipated that changes will be made to incorporate a special educational provision for intellectually gifted children. It is envisaged that the present residential schools will accommodate intellectually gifted children.

The establishment, by the Ministry and other government agencies of such schools and educational programmes to cater for intellectually gifted children raises a number of important questions. These may be better resolved on the basis of research findings. The basic problem will be how to identify these children.

It is indicated in the literature, that the most common measures of intellectually gifted children are standardized instruments that have been developed by psychologists in Western countries. These instruments may only be administered by qualified psychologists, and they are not only time consuming but also costly.

After an exhaustive literature search, it appears that instruments have never been tested for their applicability in Malaysian classrooms. It is, therefore, crucial that basic research in test development in order to establish reliability and validity be conducted so as to substantiate and justify their potential as selection tools for identifying intellectually gifted children.

1.5 Operational definition.

1.5.1 Intellectually Gifted

The practical application for the proposal of selecting the intellectually gifted from those of lesser ability has to do with the cut-off point in an IQ distribution. However, there is no flat rule offered because there are some differences between the intelligence tests. Terman (1925) advocated a minimum score of 140 on a Stanford Binet Intelligence Test as the criterion for intellectually gifted. As this score only constituted the top two percent, such a cut-off score seemed impractical for two main reasons. The recommendations from research limited to those with IQ's of 140 and above could be limiting. Secondly, it is not economical for an exploratory research where a large sample size is needed.

Argument about the minimum IQ score needed for the categorization of gifted children is still continuing. A study conducted among British children by Hudson (1966) indicated that for success in scientific subjects, a minimum IQ is 115 and that above an IQ of 125 further increments are not important. Successes in arts require lesser IQ than science and an IQ of over 115 does not contribute much towards success. This finding is parallel with the achievement among the Terman's (1925) intellectually gifted children as reported by Oden in 1968.

For the purpose of research, in a conference attended by 30 prominent academicians in May 21-23, 1959,the NEA (National Education Association) of America has suggested,

> 'Somewhat better success is obtained when the line is drawn on a percentage basis.... Earlier conferences under NEA auspices recommended that the Academically Talented Project focus on the upper 15 to 20 percent, or, more precisely, on the population one standard deviation above the mean.... In the research conference, from which this report emerged, it was observed that in local situations the centre of attention might be upon the upper 20 percent of an individual school (Anderson,1961 p 13)'.

On the basis of the suggestion put forth by NEA and Hudson's research findings stated above, for this study, intellectually gifted children are defined as those who have a score of 120 which is 1.33 standard deviations above the mean, of the 1974 version of WISC-R. Theoretically, the children having a score of 120 and above are among the top 10 percent. This procedure is in-line with the procedure of selecting intellectually gifted children in USA, where their criterion on tests of intelligence ranges from one-and-a-third to two standard deviations above the mean (Karnes and Collins, 1978).

1.5.2 Standardised Measurement

A standardised measurement is either a test or an inventory whose scoring, norms and administration have been established as a result of the test or the inventory being tried out on large numbers of subjects. The standardised

measures used in this study are Raven's Standard Progressive Matrices (Raven's SPM), Weschler Intelligence Scale for Children-Revised (WISC-R), Scale for Rating Behaviour Characteristics of Superior Students (SRBCSS) and School Failure Tolerance (SFT).

The rationales for using these measures or instruments are discussed in greater detail in chapter II. In short, Raven's SPM has been found to be a culturally and verbally free group intelligence test. The WISC-R is chosen instead of Stanford Binet due to its popularity among practising psychologists (Karnes and Collins, 1978) and WISC-R is found to be well-researched (Mueller, Matheson and short, 1983), 1983). The SRBCSS is more popular and well-researched compared to other teacher rating scales (Burke et. al., 1982). SFT is used in this study because it is the revised version of the measure for Locus of Control (that was widely administered to determine children's personality), based upon the attribution and the achievement theory of motivation.

1.5.3 The stability of the measures.

The usefulness of standardised tests are assessed according to two criteria, namely validity and reliability of the test scores. The validity of the test is the measure of what the test is intended to measure and the reliability is the measure of the test's score consistency. Thus, the stability in this study is the reliability of the test's

score reported in terms of standard error of measurement (SEM). In theory, 'SEM is the percentages of the test-score variance that is attributable to the true differences rather than error'(Cronbach, 1990 p194).

The relationship between the reliability coefficient and the SEM can be explained by the formula:

SEM^2 = observed score variance x (1-reliability index).

Thus, in the case of a standardised score of 100, with SEM of 3, the 'true' score of the individual at 95 percent confidence interval is between 97 to 103.

1.5.4 Efficiency and Effectivenes

It was Pegnato and Birch who, in 1959, introduced the concepts of effectiveness and efficiency of various measures of giftedness. They defined effectiveness as the percentage of gifted children the measure locates. The efficiency on the other hand, is the ratio between the total number of children referred and the number of gifted children found among those referred.

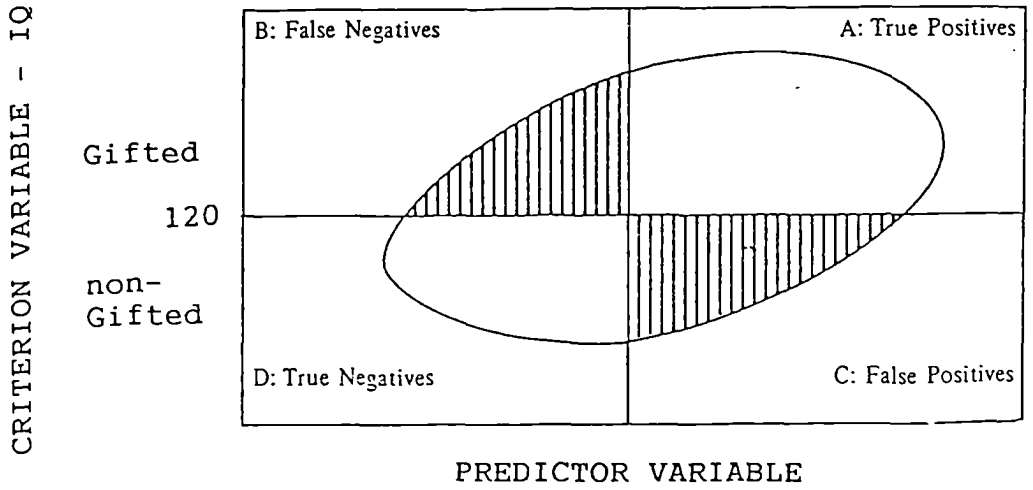
Assuming that there are 20 gifted children in a class of 100 pupils. Thirty six pupils are achieving grade A in Mathematics, and among the 36 children who are having grade A, fifteen are gifted. The effectiveness of grade A in Mathematics in identifying gifted children is, 15/20x100, or 75 percent. The efficiency is calculated as, 15/36x100, or about 44 percent.

A good measure is one that has high effectiveness and high efficiency. However, if the objective is to find as many gifted children as possible, more emphasis should be put on the effectiveness rather than the efficiency (Pegnato and Birch, 1959).

1.5.5 The False Positive and the False Negative

The pertinent problem in the identification of gifted children, according to Fineman and Carran (1986), is to reduce two types of errors namely the false positive and the false negative. A false positive is to include the non gifted and the false negative is to exclude the actual gifted (see Figure 1.2). Since the residential school is built for the intellectually gifted Malay children, a false negative is more serious than a false positive. However, an effective identification measure is the one that not only reduces the false positive but is also able to minimize the false negative.

Figure 1.2
The Errors in Identification
of Intellectually Gifted Children



1.6 Objectives of the study

The specific objectives of the study are as follows:

a. to determine the reliability and validity of various standardized measurements of giftedness such as:

i. Group and Individual Intelligence Tests,

ii. Teacher and Parent Rating Scales, and

iii. Pupils' Self Appraisal;

b. to determine the effectiveness and efficiency of UPSR in identifying intellectually gifted Malay children;

c. to propose a multi-stage procedure of identifying intellectually gifted Malay children by recommending referral/screening instruments and final confirmation of instruments with cost consideration; and

d. to propose the establishment of a longitudinal research study to determine the stability of the proposed measures.

1.7 Research Questions

a. Do standardised measurements or instruments developed in the West prsent convincing evidence (in terms of reliability and validity) to justify their effectiveness in identifying Malay gifted children in Malaysia?

b. How effective and efficient is current policy and procedure, using UPSR as measure of giftedness?

c. To what degree are these measures predictive of giftedness?

d. In a proposed multi-stage identification procedure, what measure/s should be used as screening so that an individual intelligence test can be administered as a final confirmation?

1.8 Assumptions.

It is crucial to state clearly the three assumptions made in this study. An assumption is a generalization and not an empirical fact. The assumptions below are believed to be true at the time the research study was conducted. Debates about the merits of the research assumptions are not discussed.

The first assumption is that there exists an identifiable group of Malay children who may be appropriately categorized as intellectually gifted. The criteria for the identification of this group of children are founded on the basis of their IQ score derived from Wechsler Intelligence Scale for Children-Revised (WISC-R).

The second assumption in this study is that the child's potential for learning is measurable through their intelligence. The Malay version of the 1974 WISC-R score is assumed to be the standard measure of intelligence and is the predictor for the academic success of the children.

The final assumption for this research study is that the educational programmes in the residential schools are tailored towards the needs of intellectually gifted Malay children.

1.9 Scope of the study.

There are two main limitations on this study i.e. the location where the study was conducted and the respondents. The study was conducted in one district in Peninsula Malaysia. Since there are geographical and social differences among the districts, the generalizability of the findings may be restricted. Therefore, the district has been chosen with the help of a computer in two departments namely the Statistics Department and the Prime Minister's Department of Malaysia. The district was selected so that its population characteristics and statistics most closely reflected those of the Malay population as a whole. The Malay population's median statistics for age, income, education level and family size, and the distribution of the Malays according to the rural-urban dimension were the indicators used to identify the district.

The second limitation is that this study focuses only on Malay children. This is done for two reasons: technical and applicability. Technically, this study involves standardised measurements or inventories such as intelligence tests and self ratings. These measurements are sensitive to the socio-cultural backgrounds of the respondents. The other reason for choosing Malay children as the respondents is that residential schools are currently admitting Malay children and the study only focuses on Malay children so that the ministry can consider applying the findings.

1.10 Contribution of the findings

Providing an educational programme for the gifted needs a substantial allocation in terms of finance and resources. In Malaysia, this allocation comes from the tax payers. The public has demanded that the Ministry and other institutions should provide some evidence of accountability.

In Education, achievement in public examinations is normally accepted as an indicator of whether the administrators have spent public money wisely. The cost to the taxpayers per student is almost five times higher for a residential placement compared with an ordinary student place. The Ministry's effort to find alternative and more effective procedures to select candidates for the residential schools has to be supported.

In Malaysia, the growing awareness of the importance of having a good result in UPSR has forced many parents to send their children to tuition classes (Sharifah and Azizah, 1991). They are of the opinion that `test-wiseness' has considerable influence in UPSR. Therefore, UPSR as a measure of `potential to learn' remains questionable.

In Great Britain, many research findings indicated that the 11+ Examination result wrongly placed British students in secondary schools. These findings are contrary to Gardner's (1961) suggestion that standardized achievement tests revealed intellectual gifts at every level of the

population in USA. Therefore, a research study has to be conducted to determine other, preferably low cost measures to identify intellectually gifted children. The study will also attempt to indicate that these other measures will either serve as a supplement to or a replacement for UPSR.

The findings, likely to emerge from this study, will indicate further areas for subsequent research. The most immediate would be a replication of this study in an other location or district so that the findings can be validated. A longitudinal research study on the stability of the measurements would generate data to enable the ministry to decide the usefulness of these measures. It is hoped that these findings will contribute some insight on the complexity of the identification of gifted children in a Malaysian context.

CHAPTER II

LITERATURE REVIEW

2.1 Preamble

This chapter focuses on three major issues; the concept and definition of giftedness, models of identification and measures used to identify gifted children. It has been established that the identification programme is based on the definition of the gifted. Since there are various `categories' of giftedness, the discussion of the concept and the definition of giftedness is being confined to the intellectually gifted.

Models for identification are proposed so that various measures (test, inventory, checklists and others) can be systematically administered. Each model has its own shortcomings. However, educationists and psychologists have been researching to increase the effectiveness and efficiency of various measures used to identify gifted children.

2.2 The Concept and the Definition of Giftedness.

People across all ages have been interested in men and women who have displayed superior ability. According to DuBois (1970), the Chinese, as early as 2200 BC., had developed an elaborate system of examination to select outstanding candidates for government administrative positions. Guy M. Whipple has been credited as the first to

use the term gifted in describing intellectually superior individual (Passow, 1981).

Since `giftedness' is a psychological construct or concept, it can be only be inferred by observing certain characteristics or behaviours of individuals. Thus, after Terman initiated a major study on gifted children, terms such as gifted, talented, potential gifted and latent gifted are frequently used to address the concept `giftedness' (Hagen, 1980).

The terms academically or intellectually gifted/talented are often used interchangeably in the literature. In some definitions, the term gifted refers to intellectually or academically gifted/talented. However, according to Feldman (1979) in some definitions, talented and gifted are differentiated, where talented are those with exceptional psychomotor ability and gifted are with high cognitive ability. There are some definitions which regard gifted as superior to talented in cognitive ability. This particular definition argues that talented is potential or latent gifted (Hagen, 1980). As this study focuses on the intellectually gifted, the term `gifted' used hereafter refers to those with high cognitive ability which may include potential or latent giftedness.

Most of the definitions of the gifted include some reference to intelligence without attempting to define in

detail the precise nature of that intelligence (Fox, 1981). Terman (1925), using a psychometric theory of intelligence, proposed that a person could be considered gifted if he/she scored 140 and above on the 1916 version of the Stanford-Binet Intelligence Test. This definition was operational as gifted children made up the top one percent of his cohort. Since intelligence tests only measure the capacity of an individual to understand the world (Weschler, 1959), Terman's definition of the intellectually gifted is also highly restrictive and univariate. Several much broader definitions have been proposed by adding other skills that are specified and in the degree of excellence that must be examined in those areas (Renzulli, 1978).

The most popular multifaceted definition of gifted and talented is that proposed by Marland in 1972. In his report to the Congress of the United States of America (USA), Marland proposed that gifted and talented children are

> `capable of high performance... [Included are] those with demonstrated achievement and/or potential ability in any of the following areas, singly or in combination:
>
> 1. general intellectual ability,
> 2. specific academic aptitude,
> 3. creative or productive thinking,
> 4. leadership ability,
> 5. visual and performing arts, and
> 6. psychomotor ability.' (p.10)

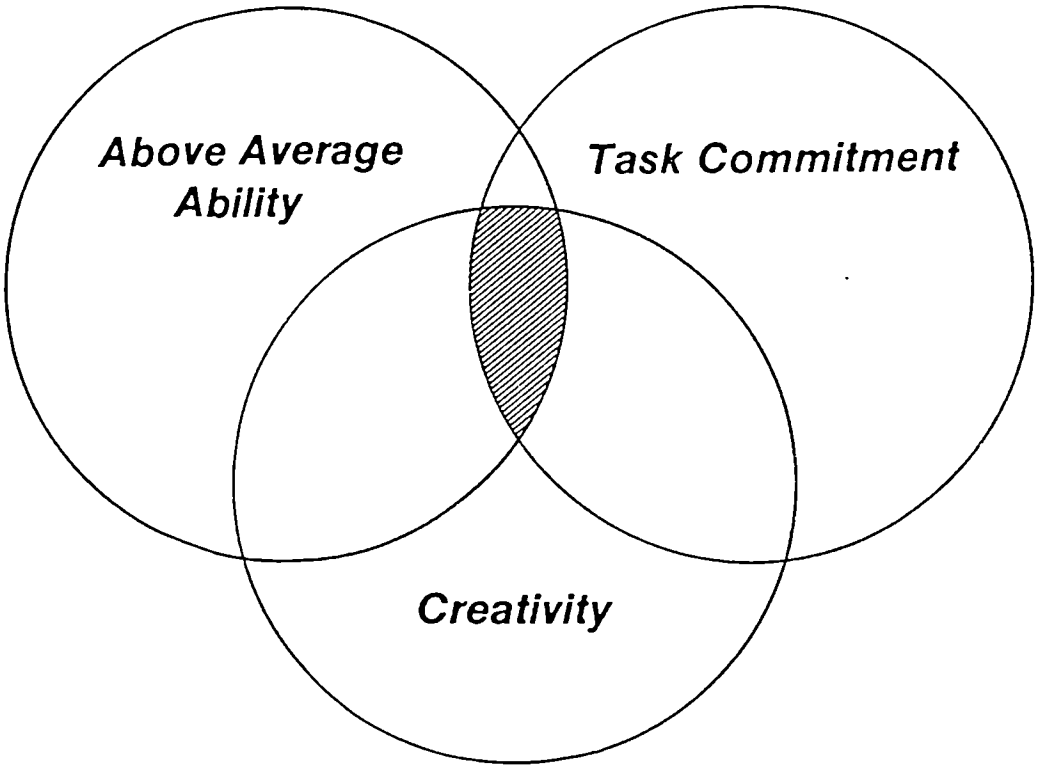
In adopting Marland's definition for the Federal Legislation Pub. L. 91-230, #806, Congress dropped the sixth category that is psychomotor ability. In a survey conducted

by Karnes and Collins in 1978, 42 out of 50 states in USA had formulated guidelines modelled along the Federal Legislation definition, with general intellectual ability clearly specified. Although the Federal Legislation requires gifted children to be identified by experts, in most states, giftedness is identified by using intelligence tests. The criterion for giftedness on tests of intelligence ranges from one-and-a-third to two standard deviations above the mean (from the top 10% to the top 2%).

In the light of his research, Renzulli (1978) pointed out that Marland's definition failed to address non-intellectual factors such as motivation and creativity which are important behavioural criteria among gifted children. Renzulli was also concerned that the definition proposed by Marland tended to be misinterpreted and misused by educators to develop identification systems based on the six categories as if they are mutually exclusive. In return, Renzulli (1978) in his famous `The Three Rings Conception of Giftedness' argued that giftedness consisted of three basic clusters of human traits namely above average ability, task commitment and creativity. Thus gifted and talented children according to Renzulli (1978) possess or are capable of developing this composite set of traits and applying them to any area of human performance (Figure 2.1). He contended that his proposed definition is based on numerous research studies of gifted and talented individuals. Without doubt this

definition provides guidance, guidelines and direction for an identification programme but according to Fox (1981), advocates of Renzulli's definition will identify fewer students.

Figure 2.1
The Three Rings Conception of Giftedness



Source: Renzulli, 1981 (p.28)

Definitions proposed by psychometricians differ on whether or not evidence of potential alone is a sufficient condition for giftedness. Some require only the evidence of achievement. Other definitions, like the one forwarded by Fliegler and Bish (1959), insisted that giftedness should be measured on both potential and functional skills necessary for academic achievement in the top 15% to 20% of the population. While the former definitions recognised the underachieving gifted, the definition forwarded by Fliegler and Bish leads to a paradox in the concept of underachieving.

A major conception of giftedness and talent has been Howard Gardner's (1983) theory of multiple intelligence. Gardner challenges the notion of `general intelligence' (typically measured by IQ) adopted by psychometricians and suggests that it is possible for individuals to be gifted in at least seven independent intellectual domains: they are linguistics, logic-mathematical, spatial, bodily-kinaesthetic, musical, interpersonal and intrapersonal. Gardner argued in school settings that the combination of linguistic and logico-mathematical domains are most addressed and valued.

Sternberg (1981) attempted to understand intellectual giftedness by drawing upon the information-processing theory of intelligence. He argued that studies of giftedness using

a psychometric theory of intelligence are limited to the measurable attributes of the gifted. On the other hand, Sternberg proposed that an Information Processing theory of intelligence provided a more comprehensive methodology to identify the differences in mental structure, contents and processes that enable educators to differentiate gifted from their ungifted peers.

Thus, Sternberg proposed that there are three components of intellectual giftedness namely metacomponents, performance components and transfer components. Metacomponents are a higher-order process used in problem solving. Performance components, on the other hand, are for the execution of a problem-solving strategy such as encode, reference, mapping, application, comparison, justification and response. Transfer components according to Sternberg, are involved in acquisition and retention of knowledge or information. Gifted individuals are those who are capable of manipulating many of these components at a high level and are also 'more sensitive to the feedback that various components can provide' (p.91). Recently, according to Sternberg (1985, 1988), there are three main kinds of giftedness namely analytic, synthetic and practical abilities. Analytic giftedness involves being able to dissect a problem and understand its parts. Synthetic giftedness includes the abilities of insight, intuition, creativity, or adaptation to novel situations. Practical giftedness involves applying

analytic and synthetic abilities to everyday pragmatic situations. Though it is a promising and comprehensive hypothesis, it is still in the research stage. There is as yet still a need for a method to identify gifted children.

Based on Piaget's cognitive developmental theory, Stanley, Keating and Fox (1974) equated gifted and talented to `precocity'. Stanley (1976) noted that scoring well beyond ones chronological age on a difficult test implies not just earlier development, but also higher levels of ability that "presage long-range, lasting differences in ultimate ability"(p.6). This definition enabled educators to identify academically gifted children in one or more specific areas without necessarily exhibiting overall general intellectual superiority. Thus, the number of gifted identified would be according to the number of talent areas and the extent of overlap among them.

Although attempts are made to expand the classical definition of giftedness to include various measures other than intelligence tests, there is still a lack of agreement among psychologists and educators as to the definition of giftedness. The conception of human intelligence is still crucial and central in defining giftedness. Although various measures are proposed to be included in the identification of intellectually gifted children, intelligence tests and, to some extent, achievement tests are two common measures of giftedness.

2.3 Methods of Identification.

Identification process and procedure is closely related to the adopted definition of gifted. Since the definition of the construct 'giftedness' has shifted from univariate to multivariate, the identification of gifted children has become more complex and complicated as more sophisticated identification tools or measures have been utilised. Two approaches or models have been proposed that enable the identification tools to be effectively deployed namely a Traditional Approach and a Multiple Measure Approach.

The main concern in the identification of gifted children is to reduce two types of errors which according to Fineman and Carran (1986) are the false positive and the false negative. A false positive is to include the non-gifted who did not actually meet the programme's requirement. On the other hand, a false negative is an actual gifted child that is being excluded from the programme. Fineman and Carran asserted that a false negative is more serious than a false positive.

2.3.1 The Traditional Approach.

The Traditional Approach, or sometimes called the Traditional Model, is the first method of identification that was proposed by Terman in 1926. It consisted of referral or screening and final confirmation measures. In his study, Terman used teachers' nomination as a referral and a Stanford Binet Intelligence test as a final confirmation. Among those nominated by the teachers, Terman (1926) identified the children as `gifted' only if they scored 140 and over on the Stanford Binet Intelligence Test. Thus, advocates of `giftedness' relied heavily on quantified cognitive processes and so intelligence scores became the main criterion for selecting gifted children.

In addition to the teachers' nomination being used as an instrument for referral, others such as parental rating, student achievement and group intelligence tests are currently employed. According to Pegnato and Birch (1959), referral measures have different levels of effectiveness and efficiency in identifying intellectually gifted children in America (Table 2.1). Therefore, in order to reduce the false negative through a traditional approach, one has to utilise a referral or screening measure that has substantial effectiveness and efficiency.

Table 2.1
Efficiency and Effectiveness of
Referral/Screening Methods

Method	Efficiency (%)	Effectiveness (%)
a. Teacher nomination	26.6	45.1
b. Honor Roll	18.0	73.6
c. Creativity	10.2	15.1
Art Ability	9.1	6.6
Music Ability	11.1	9.9
d. Student Council	15.8	14.3
e. Mathematics Achievement	27.9	56.0
f. Group Intelligence Tests		
Cut-off IQ 115	18.7	92.3
Cut-off IQ 120	27.1	71.4
Cut-off IQ 125	38.1	43.9
Cut-off IQ 130	55.5	21.9
g. Group Achievement Tests	21.5	79.2

Source: Pegnato and Birch, 1959 p.303

As for the final confirmation of the giftedness, the Traditional Approach relied on either an individual intelligence or an aptitude test. The Stanford Binet and Weschler Intelligence tests are widely used as a final confirmation measure. The Traditional Approach has, therefore, been widely criticised due to its total dependency on standardised mental or intelligence tests as the criterion to identify gifted children (Renzulli and Delcourt, 1986). The controversy surrounding IQ testing among psychometricians is directly used as a basis in questioning the merit of the identification programme put forth by this approach.

2.3.2 The Multiple Measures or Multiple Criterion Approach.

If we accept the current preference for the broadened conception of giftedness, the use of a single dimension intelligence test as the ultimate criterion for the identification of gifted children is no longer valid. Various forms of information have to be considered to suit the multifaceted definition of gifted children. An early form of multiple measures that was employed, as reported by DeHaan (1962), to select candidates for the Superior and Talented Programme in Central America was as follows:

> He is given two points if his IQ is 110 or if it is above the 75th percentile, one point for a score on the standardised achievement test above the 75th percentile, and one point if his grades are B or above, and one point if he is recommended by a teacher, and one point if his standardised reading score is above 50th percentile. If a student's total score is four out of possible six points, it is recommended that he be included.. p221

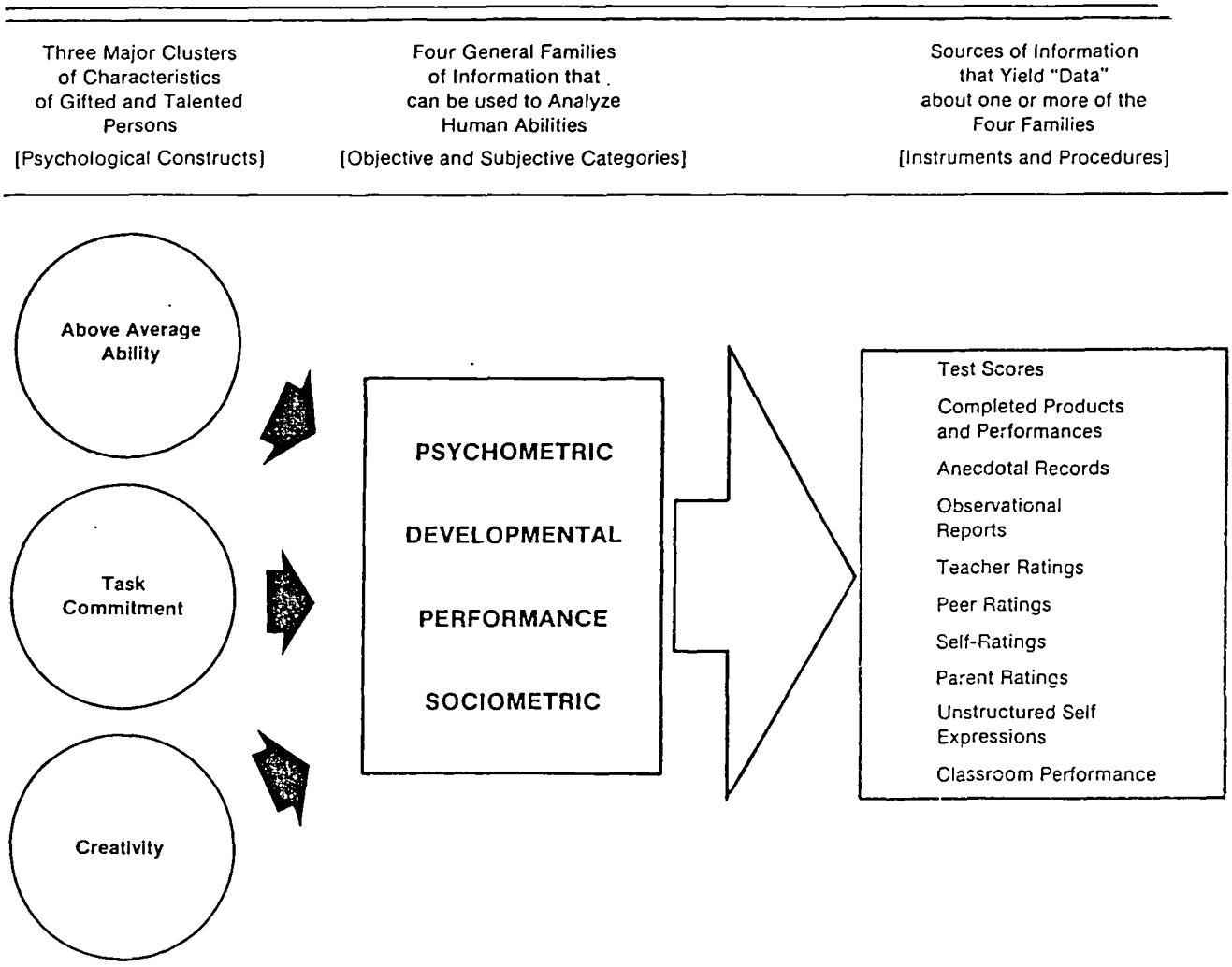
Some of the variations on this design include the use of a different or broadened range of predictors. Feldhusen, Baska and Womble (1981) observed that most of the multiple criterion approaches converted the data to a standard score to ease the comparison. The multivariate analysis proposed by Glasnapp et. al. (1981) and an additive or weighted matrix forwarded by Baldwin (1978); Weber and Battaglia (1985) are also used to obtain a standardised score to facilitate classification. It is important that these matrices are

developed according to both the definition and the proposed gifted programme. Therefore, they are situational in nature because socio-cultural backgrounds of the respondents will influence the formulation of these matrices.

In recent years, the selection of gifted children in some states in America has no longer been based on the proposed matrices (Birch, 1984). All relevant information is considered by the selection panel consisting of experts from various fields to decide whether or not the child is selected to enrol into the programme. The latter technique is called 'case study'.

Renzulli, Reis and Smith (1981) proposed The Revolving Door Identification Model (Figure 2.2). This identification model is based on his famous definition of the 'three rings conception of giftedness. Since giftedness according to Renzulli is not a fixed entity, the Revolving Door Identification Model argued that educators should identify, select, educate, and assess each individual. Thus this model advocates identify-educate-assess, which is likely to reduce both errors (false positive and false negative) during the identification of gifted children. It is costly and time consuming because it involves not only identification, but also curriculum planning, implementation and evaluation.

Figure 2.2
The Revolving Door Identification Model



Source: Renzulli, Reis and Smith, 1981 (p.28)

Since there are many tests and appraisals used in multiple measures, those psychologists and educators advocating multiple measures have to consider either the depth or the breadth of such tests. As for the depth, gifted children are selected if they scored superlatively high on any one of the assessment areas regardless the level of their performance in other areas, whilst for the breadth, gifted children are selected if they score moderately well on several assessment areas simultaneously. Dirth and Quarfoth (1981) suggested that the depth has more advantages than the breadth especially in identifying the gifted among underachievers. This finding alone is not conclusive and so more research needs to be conducted to determine `what breadth and how in-depth' a particular test or inventory ought to be.

2.3.3 Evaluation of the Approaches.

Proper identification of gifted children needs a great deal of time, effort and money (Oglesby and Gallagher, 1983). According to Kirschenbaum (1983), the debate regarding the identification of gifted children has been intense. Despite efforts to minimise errors, the proposed approaches or methods of identification are still being criticised due to the purportedly high number of false positives and false negatives found in the selection pool (Harrington, 1983).

A study conducted by Renzulli and Smith (1977) compared cost efficiency and effectiveness of the traditional and the multiple criterion approaches. They found that the traditional model not only cost three times that of the multiple measure, but it also identified fewer gifted children. Since the multiple measure gathered more information, Renzulli and Smith alleged that it was superior and effective in identifying minority and disadvantaged students.

As Renzulli and Smith are known to be strong advocates of multiple measures, the findings of their study may still be questionable. Since the multiple measure approaches requires more information than a traditional approach, it is unlikely that the cost is lower than the traditional approaches. As for the errors and its superiority, this finding alone is not conclusive. More longitudinal research studies need to be conducted to verify which approach is likely to have less errors, especially false negatives.

2.4 Measures Used to Identify Gifted Children.

Various measures are being deployed to identify gifted children, both, in Traditional and Multiple Measure Approaches. Each measure has advantages and disadvantages and thus has a different level of effectiveness. Some of these measures were developed with no intention of being used to identify gifted children. Among the commonly used measures are Intelligence Tests, Achievement Tests, Teacher Nomination/Rating, Parent Nomination, Peer Rating and Child Self Appraisal.

2.4.1 Intelligence Tests.

The use of an intelligence test to identify gifted children is based on the classical definition of giftedness i.e. high intelligence. It is interesting to note that the first intelligence test was developed by Binet and Simon in 1905 to identify educationally subnormal children in Paris. In 1920, Terman extensively revised the test in the United States of America and the revised version of the test is now called the Stanford Binet Intelligence Test. More intelligence tests were developed due to requests from the United States Army to identify personnel for the air force, navy, infantry and marines during World Wars One and Two.

According to Hollingworth (1951), although intelligence tests will not be able to pick out all mentally

gifted children, they are probably the most effective single instrument available to select them. There are two types of intelligence tests; group and individual. Group intelligence tests, such as the Ottis-Lennon and Hennon-Nelson Mental Ability Test, are used mainly for screening or referral purposes.

Group intelligence test scores often correlate highly with scores on individual intelligence tests (Covin, 1977; Lowrence and Anderson, 1979; Rust and Lose, 1980) and can be administered quickly and economically by persons with a minimum of training. But on the other hand, group tests do not have a high enough ceiling to differentiate well among the most able children (Pegnato and Birch, 1959). In one study conducted by Martinson and Lessinger of 332 gifted children in 1960, of those who scored 130 or higher on an individual intelligence test only half scored 130 or higher on a group intelligence test. Thus, for screening purposes, they suggested lower scores be used to avoid false negatives i.e. depriving true gifted children from being identified.

Individual intelligence tests are normally used as a final confirmation of giftedness. Evidence of the long term predictive validity of an individual intelligence test score, for identifying gifted children, has been derived from Terman's 1926 longitudinal study of those with scores of 140 or higher on the Stanford Binet as reported by his student

Oden (1968). As adults, the gifted identified by Terman have a high proportion of prestigious degrees; are pursuing professional careers; have published books and articles; and holding patents and awards. As a group, they performed better than their peers. As individuals, there are some subjects in Terman's study who were not successful.

To date, there is enough evidence to suggest that individual intelligence tests can accurately identify gifted children from kindergarten level upward (Martinson, 1961; Reynold, 1962). Their limitations compared to group tests are that they are time consuming and require specially trained personnel. Individual intelligence tests do not adequately cover such areas as creative potential, leadership quality, aesthetic production or psychomotor skills. Individual intelligence tests also penalise children with language or environmental handicaps (Martinson, 1974; Vernon et. al., 1977; and Fatouros, 1986). As a response to such criticism, psychologists developed a culturally fair intelligence test, in which the dependency on verbal instruction is minimised. However, a culturally fair intelligence test is poor index of potential because the verbal component is an important predictor of achievement (Gallagher, 1985). Therefore, Mercer and Lewis (1977) proposed the use of a multiple norm but most of the intelligence tests are yet to be published.

In their survey, Karnes and Collins (1978) found that the Stanford Binet Intelligence Test and the Wechsler

Intelligence Scale for Children-Revised (WISC-R) are the most commonly used individual tests to identify gifted children in America. Interestingly, in their literature survey, Mueller, Matheson and Short (1983) found that WISC-R was the single most popular and well-researched instrument to be used for the assessment of intellectual functioning in both clinical and academic settings. Norms for the WISC-R have been developed in many countries throughout the world (Rashed, 1989).

In terms of quality, the items in the WISC-R have been the subject of literally thousands of research investigations and have been found to be clinically and psychometrically sound. The WISC-R verbal and performance scales are found to be correlated with Cattel's (1971) crystallized and fluid abilities (Kaufman, 1979). According to Meeker (1975), the WISC-R are as if developed from Guilford's SOI (Structure of Intellect) model. Therefore, based on these findings, the WISC-R has strong theoretical backing in quantifying intelligence.

The intelligence measured by the WISC and WISC-R is also found to be the best predictor of school achievement. Sattler (1974) found out that the correlations between Full scale IQ of WISC and a wide variety of achievement measures averaged 0.61. For the Full scale IQ of WISC-R, a similar magnitude, in terms of correlations, have been reported for groups of white or predominantly white (Hale, 1978), for

groups of minority or primarily minority youngters (Harlage and Steele, 1977), and for exceptional populations (Raskin, Bloom, et al. 1978).

The WISC-R consists of 10 compulsory subtests and is therefore, time consuming to administer. It is interesting to note that in the last decade, research studies on the WISC-R have indicated that the short-form of the WISC-R consisting of vocabulary and block design subtests is comparable to a Full Scale WISC-R for gifted children (Dirks, Wessels, Quarfoth, and Quenon, 1980; Karnes and Brown, 1981; Elman, Blixt and Sawicki, 1981; Lustberg, Motta and Naccari, 1990). Therefore, if a short-form of WISC-R can be effectively used for screening purposes, an enormous amount of time and money can be saved.

2.4.2 Teacher Nomination/Rating

A number of researchers have reported that intelligence tests and teachers' rating/nomination are the two most commonly used tools in selection or identification programmes (Jenkins, 1979; Alvino et al., 1981; Yarborough and Johnson, 1983). Terman (1925) selected gifted children for his sample from the list provided by teachers. In a landmark study by Pegnato and Birch (1959), teachers were able to effectively identify about 50% of gifted children. Their finding has stimulated many studies to increase the efficiency and effectiveness of teachers' nomination/rating.

In an identification programme, teachers are either asked to nominate any children either without any guideline or to rate each student using a given set of rating instruments. Some teacher effectiveness studies are according to Denton and Postetlethwaite (1984) are very badly designed. Therefore, their findings, as presented in Table 2.2, have to be interpreted cautiously. Based on the information provided by Table 2.2, teacher nomination has an effectiveness of between 0 to 70% with the mean of 35.5%. For the efficiency of teachers nomination, it ranges between 26 to 78%, with the mean of 47.2%. Thus using IQ as a criterion for giftedness, teachers' nomination seems not to have been very successful in identifying gifted children.

Table 2.2

Effectiveness and Efficiency of teachers Nomination using an IQ test as a criterion measure

Investigation	Year	N	Effectiveness	Efficiency
Ashman & Vukelich	1983	183	33%	78%
Baldwin	1962	140	NA	26-38%
Cornish	1968	86	31%	42%
Hartsough, Elias & Wheeler	1978	536	0%	NA
Jacobs	1971	654	10%	4%
Lowenstein	1982	163	70%	69%
Pegnato & Birch	1959	781	45%	27%
Wilson	1963	205	45%	NA

Note: NA - not available

Perhaps data from Denton and Postlethwaite (1984) can be used to explain this phenomenon. Using regression analysis, Denton and Postlethwaite found that teachers and IQ tests (using Differential Aptitute Test or DAT) used different predictors for giftedness. In physics for example, MR (Mechanical Reasoning) was the best single predictor of achievement but for teachers, the predictor was VN (General Academic Ability) that consisted of verbal reasoning and numerical ability. Therefore, the variation of effectiveness and efficiency of teachers nomination using IQ as a criterion might be due to a different conception of the nature of giftedness. If IQ is to be used as the only criterion for giftedness, teachers should probably be trained before being asked to nominate gifted children.

Teachers' ratings should be more effective and efficient than teachers' nominations because there are specific guidelines for ranking (Renzulli and Hartman, 1971; Borland 1978). A study by Solomon (1979) indicated that by using a checklist, teachers' identification efficiency increased from 25% to 50%. Contrary to that, Ashman & Vukelich (1983) found that the effectiveness of teachers rating was 20-81% (33% for nomination) and for efficiency, the teacher rating was 54-71% (78% for nomination). Teachers' rating was more variable than teachers' nomination. Using correlation technique, teachers' rating has a low correlation with IQ test (Table 2.3). Like teachers' nomination, the teachers' rating is also a poor predictor of giftedness if the giftedness is being defined by intelligence tests.

Table 2.3

Correlation of Teachers rating with IQ test

Researcher	Year	N	Finding(r)
Borland	1979	195	0.22,0.32
Kirk	1966	112	0.41-0.73
Renzulli, Hartman & Callahan	1971	72	0.36,0.61
Rust & Lose	1980	438	0.01-0.20

The most widely used teachers' rating is the Scale for Rating Behaviour Characteristics of Superior Students (SRBCSS) developed by Renzulli, Hartman and Callahan (1971). They reported that SRBCSS significantly discriminated between gifted and average children, has a promising reliability coefficient (r=0.77 to 0.91). The construct validity of the SRBCSS is established by using factor analysis. However, Renzulli et. al noted that SRBCSS is intended to provide an objective aid to guide teacher judgement in identifying gifted children. Thus, if the criterion of giftedness is based on IQ scores the SRBCSS was not successful in aiding teachers in their identification of gifted children (Rust and Lose, 1980). In light of this finding, Burke, Haworth and Ware (1982) suggested that SRBCSS has to be extensively studied.

There must be some explanation why both teachers' nomination and teachers' rating did not successfully identify gifted children. Awanbor (1989) found that teachers are more likely to use scholastic achievement as an index to identify gifted children. Burt (1955) alleged that teachers gradings' are markedly biased in favour of memory or capacity to learn. Data from a large body of research on the notion of `self fulfilling prophecy' indicated that teachers behaviour and attitude are often determined more by physical attractiveness, compliance and active participation. Most gifted children are, on the other hand, are `precocious'

(i.e. in the formal operational stage instead of in the concrete operational stage according to Piagetians) (Keating, 1975). Hence, they do not demonstrate their ability because of their perception that working harder is not advantageous (Burden, 1979). Therefore they have a tendency to exhibit undesirable behaviour to the teachers, as they appear to be bored, lazy and indifferent in the classroom (Benn, 1982).

Teachers, having diverse job specifications, are not expected to be well trained psychologists. Since the number of gifted children is small, teachers' time and attention are fully occupied with other children. It is interesting to note that Gear (1975) found that teachers can be trained to improve their efficiency in identifying gifted children. Teachers who attended a special training programme were able to identify 86 percent while teachers in the control group only identified 50 percent of gifted children. Since the cost of training all the teachers is high, if possible, an initial study should be conducted to find the type of teacher that has the highest effectiveness in identifying intellectually gifted children so that they can be trained to identify intellectually gifted children in the classroom.

2.4.3 Parent rating

Despite criticisms that parents' ratings are biased, where it is said that they manifest a tendency to over-estimate their children, in the process of identifying gifted children, parents are as good as and sometimes better than teachers in identifying gifted children (Hagen, 1980; Ciha, Harris & Hoffman, 1974). With the attenuation of IQ during first two years of schooling, intelligence tests and teachers' rating/nomination might not be able to so effectively identify gifted children (Jacobs, 1970).

As teachers' effectiveness of rating/nomination are low, especially when the children are of a young age, parents may better identifiers of gifted children (Jacobs, 1972). There is a reservation about the capability of parents nomination with regard to their educational level and background. However, Ciha, Harris and Hoffman (1974) found that parents with a low level of educational and economic background are better than teachers and equal to parents having higher level of education and from a higher socio-economic background in identifying gifted children (Table 2.4).

Table 2.4
The Effectiveness(%) of Parent and Teacher Rating*

Student	Parent	Teacher
All students	67.0	22.0
High SES**	61.0	5.5
Low SES	75.0	21.0

*adapted from Ciha et al., 1974)
**SES: Socio-economic status

Since the above study was conducted in an urban and white dominated area, the parents are assumed to practise good parenting. If a parent that practises good parenting can be an effective identifier of gifted children, then, the indicators of good parenting such as the amount of time spent, educational level and child's attachment are to be factors that need to be studied before a general conclusion on the effectiveness of the parent rating can be derived.

To date, parents are recognised as important identifiers of giftedness although the research on parents' effectiveness is found to be not as extensive as compared to that on teachers. Various forms of parents' rating scales are proposed but not a single standardised parent rating scale has yet been published.

2.4.4 Academic Achievement.

In some countries, students are being tested at various stages of schooling either using a standardised achievement test, or a public achievement test. Student performance in each examination will determine the type of educational facilities which will be provided for them. Like other countries, Malaysia seemed to equate high achievers with gifted children. Hence, those who do well in the Primary Assessment Test (public achievement test) are selected for government boarding or residential schools. Candidates for scholarships and other grants are shortlisted according to their achievement in the respective examinations. The decision to use achievement test scores to stream children may be due to its strong correlation with intelligence test scores.

Pegnato and Birch (1959) found that a standardised achievement test has an effectiveness of 79.2% while standardised mathematics achievement test has an effectiveness of 56.0% in identifying intellectual giftedness. Since the correlation between the standardised achievement test with the intelligence test is high, therefore, according to Pegnato and Birch, an achievement test has a higher potential for identifying gifted children.

Most of the studies conducted using standardised achievement tests such as the American College Testing Assessment Program (ACT), Iowa Test of Basic Skills (ITBS),

and Scholastic Aptitude Test (SAT) have found that they are useful and important indicators of academic talent (Colangelo and Kerr, 1990; Davis and Rimm, 1989). Benbow (1983) indicated that a review of past research shows that the most effective means of identifying academically gifted children is through the use of standardised achievement tests. These standardised achievement tests are developed using the same procedure as intelligence tests and they reflect an academic posture similar to that of IQ tests. As the `first cousins of IQ tests (Yarborough and Johnson, 1983 p136)', therefore, the emergence of achievement tests as an additional measure or replacement for IQ tests is to be expected.

On the contrary, in some countries, public achievement tests are sometimes politically motivated. In Malaysia, the Standard Five Assessment test (recently changed to UPSR) was initially designed as a diagnostic measure (Cabinet Report, 1979). To date, there is no official data published by the Ministry of Education regarding the reliability and the validility of this test. Since its inception in 1965, it was used as the sole criterion to select candidates for the residential schools and to some extent to stream them during secondary schooling. If standardised achievement tests are found to be limiting as they eliminate gifted children who are underachievers (Renzulli, 1978; Gardner, 1983; Sternberg, 1985), the utilisation of the government's public achievement tests has to be scrutinised.

2.4.5 Child's Personality (Motivation and Creativity)

The gifted are always associated with genius and eminence among adults. Studies of the eminent adult suggest that besides intellectual factors, non-intellectual factors such as personality, motivation and creativity are also important indicators of giftedness during childhood. It had been reported that Thomas E. Edison, during his childhood spent twenty one days serving as an incubator to hatch a chicken egg. Inferred from this anecdote, behavioural traits such as persistence, tolerance, self confidence and freedom from inferiority feelings may be important indicators to be considered in identifying gifted children.

The IQ has been found to be limited in predicting occupational success (Kagan, 1971). It has been argued by Hudson (1971) that while intelligence tests measured ability, there are social mechanisms which are used to pass on educational advantages to the children. Hudson also alleged that intelligence tests leave the more creative and the more artistic at a disadvantage.

In the 30 year follow-up report of his research of intellectually gifted children, Terman (1959) suggested implicitly that besides internal factors, external factors or non-intellectual factors had to be considered for giftedness. He found that the difference between the most and least successful men among his 1925 gifted children was not in

intelligence but was due to differences in personality factors.

Roe (1952) conducted an intensive study on the characteristics of 64 eminent scientists and found that besides long working hours and fewer vacations, they would rather be doing their work than anything else. Other researchers suggested that emminent adults are self initiated and they are guided by self generated standards of excellence (Helson, 1971; Chambers, 1964; Nicholls, 1972). In the Tiverton Project, Burden (1979) observed that they:

> tended not to see it as being particularly advantageous to work harder ..[and]..this reluctance stemmed from some kind of implicit recognition that it was sometimes not quite `the done thing' to stand out intellectually-both in terms of the reaction of their peers and of their teachers. It is though they had independently gauged an optimum level at which it was acceptable to `shine' but beyond which lies a potentially dangerous no-man's land of social ostracism' (p.11-12)

As for creativity, MacKinnon's (1964) study of creative and eminent architects argued that intelligence did not differentiate between the most and the least creative. MacKinnon (1964) also proposed that highly creative persons often have enthusiasm, determination and industry in their endeavour. Both motivation and creativity are not necessarily mutually exclusive. According to Campbell (1960), fascination that underlying the motivation of creative children enables them to strive. In terms of personality, the creative individual is found to be committed to their own ideas (McCurdy, 1960; Cruthfield, 1962).

In addition, there are many research findings now supporting the view that children's perception of their own ability mediates achievement behaviour (Blumenfeld et. al., 1982). The way children perceived their ability and their attributions of success and failure can have consequences on their motivation towards school work (Dweck, 1986; Clifford; 1986). It is possible therefore, that the children's self-appraisal could become an additional criterion for giftedness.

There appears to be a disagreement about the age at which such self-assessment of non-intellectual factors should be administered. Data from research conducted in Britain (Crocker and Cheeseman, 1988) and North America (Nicholls, 1978; Stipek, 1981) suggest that it is not until 10 years of age or older that children can assess themselves accurately. In the most recent study by Blatchord, published in 1992, using children of various ethnic groups in London, children at the age of 11 appear to be `more realistic and more accurate [than other age (sic)] judges of their own attainments, when the accuracy of self assessment is assessed in terms of agreement with standardised tests (p41)'.

Although there is substantial evidence for non-intellectual factors to be considered as additional criteria in the identification of gifted children, they are not without complications. The correlation between academic

ability and these non-intellectual factors is limited (Dellas and Gaier, 1970; Torrence, Bruch and Morse, 1973). In addition, there is also lack of relationship between the non-intellectual factor during childhood and during adulthood (Nicholls, 1972). Thus, subjectivity in the measurement of these factors and the lacking of reliability and criterion-related validity forced psychologists and educationists to abandon them temporarily as a criterion for giftedness.

2.5 Summary and Conclusion

There is no single definition of giftedness that is agreed upon by educationists and psychologists. A primary result of the broadening of the concept of giftedness is to limit the use of IQ test scores. However, the definition of giftedness as a result of the broadening of the concept of giftedness based only from the research findings without taking into consideration realilities in the soceity may pose certain sociological, and subsequently political threat (Yarborough and Johnson, 1983 p.135). In the midst of multifaceted definition of giftedness, it is also interesting to note that in her survey of practices among school authorities all over the USA, Richert (1985) found that IQ is still central in defining and selecting intellectually or academically gifted. Therefore, there is a wide gap between the theory and the practise that should be resolved.

This study is the first attempt to evaluate various measures of giftedness in identifying intellectually gifted Malay children. So, with IQ as a criterion, the other measures of giftedness can be evaluated. Hence, in this study, the intellectually gifted are those who have a high IQ score.

The measures used to identify intellectually gifted children were originally designed and created in English. They have had to be translated to Malay. A pilot study had to be conducted to determine that the Malay version of these measures/instruments had similar properties, especially their reliability and validity, similar to the originals. The findings of this study are presented in chapter 3. If the instruments are found to have similar properties to the original version, then, their effectiveness and efficiency (except the WISC-R) in identifying intellectually gifted Malay children can be undertaken.

CHAPTER III

INSTRUMENTATION

3.1 Introduction

This chapter is divided into two parts. Part I focuses on the description of the instruments used to generate data for this study. Most of the information about these instruments has been extracted directly from their manuals, Eighth Mental Measurement Yearbook (Buros, 1978) and published articles. According to the literature, the instruments used to identify intellectually gifted children are intelligence tests (individual and group), teacher and parent rating scales, child self appraisal and standardised achievement tests.

In Part II, the findings of the initial study to determine the realibility of these instruments are presented. Since the instruments are in English, they have had to be translated into Malay. It is, therefore, crucial to establish the instruments' stability so that their applicability is well substantiated. Evidence of reliability and validity of the Malay version was sought to justify their usage in the research design for this study.

Part I: The Description of the Instruments.

3.1 Intelligence Tests.

3.1.1 Wechsler Intelligence Scale for Children (Revised)

3.1.1.1 Description and administration.

The Wechsler Intelligence Scale for Children-Revised or WISC-R is an individually administered intelligence test published in 1974. It was a revised version of the 1949 WISC. The WISC-R has been the major instrument for assessing the intellectual functioning of school age children (Anderson, 1976; Karnes and Collins, 1978). Compared to the WISC, the WISC-R has a number of improvements such as superior reliability, culturally unbiased and up-to-date items, and better representation (in term of diversity) of the norm (Sattler, 1974). It takes about one to one and a half hours to administer a WISC-R to each child.

The WISC-R contains a Verbal Scale and a Performance Scale of non-verbal items. The subtests for the Verbal Scale are Information (Info), Comprehension (Com), Arithmetic (Arit), Similarities (Sim) and Vocabulary (Voc). The Performance Scale on the other hand consists of Picture Completion (PC), Block Design (BD), Picture Arrangement (PA), Object Assembly (OA), Coding (Cod) and Mazes. For the Full Scale IQ computation and tabulation, Digit Span and Mazes are excluded. The detailed information about each subtest is:

a. Information (Info).

There are thirty items in this subtest. The items are sampled from a broad range of general knowledge. For children aged more than 8 years old, this subtest starts at item 11 and the test is discontinued after five consecutive failures. All items are scored 1 or 0 (pass-fail).

b. Similarities (Sim).

The similarities subtest contains seventeen pairs of words. The children are then expected to explain the similarity within each pair. For the first four items, the score for each item is 1 or 0 (pass-fail). For the remaining items, the score is 2, 1, or 0 according to the conceptual level of the responses. Three consecutive failures will lead to the discontinuation of this subtest.

c. Arithmetic (Arit).

In the Arithmetic subtest which consists of 18 items, the first 15 items are presented to the children orally and the last three are in writing. The children have to solve the problems without using paper and pencil within certain time limits. The time limit for each of the first thirteen items is thirty seconds and forty-five seconds each for the last three items. This subtest discontinued if there are three consecutive failures.

d. Vocabulary (Voc).

The Vocabulary subtest consists of thirty-two words. They are (the questions and the answers) translated into Malay using an official dictionary `Kamus Dwibahasa' published in 1980. This procedure was suggested by the publisher of WISC-R, the Psychological Corporation, when WISC-R was translated into Spanish (Chandler and Plakos, 1969). The child's oral explanation of the meanings of each word are scored 2, 1 or 0. This subtest begins with item 6 for the children of 11 to 14 years old. After five consecutive failures, this subtest is discontinued.

e. Comprehension (Com).

The comprehension subtest consists of seventeen items sampled from a variety of problem situations. All items are scored 2, 1 or 0 and this subtest is discontinued after four consecutive failures.

f. Digit Span

This is a supplementary subtest for the Verbal Scale and is not included in obtaining the IQ if the five standard verbal scale subtests are administered.

g. Picture Arrangement (PA).

In the picture arrangement subtest, children have to arrange a series of pictures in a logical sequence. The tester places the individual pictures in specified disarranged order and asks the children to rearrange them in a proper order so as to form a meaningful story. There are twelve items in this subtest and for children of 8 years and above, this subtest begins with item three. This subtest is discontinued after three failures.

h. Picture Completion (PC).

This subtest consists of 26 pictures with some essential portion missing. A maximum exposure of each picture is 20 seconds. The child will have to point out the missing part. For children of 8 years and above, this subtest begins with item 5. After four consecutive failures the test is stopped.

i. Block Design (BD).

This subtest requires the child to assemble blocks so that they are identical to a two dimensional red and white picture of abstract design shown to him earlier. There are eleven items in this subtest and children of age 8 years old will start at item 3.

j. Object Assembly (OA).

The Object Assembly subtest contains a presentation of four jigsaw problems. The child required is to assemble the pieces correctly to form a girl (seven pieces), a horse (six pieces), a car (nine pieces) and a face (eight pieces). Before the test begins, the tester demonstrated one sample item, an apple, to the child.

k. Coding (Cod).

The Coding subtest requires the coding of a series of symbols paired with other symbols. The tester scores the speed and the accuracy of the child's responses. The manual suggests Coding B for those who are over eight years of age.

l. Mazes.

As in the case of Digit Span for the Verbal Scale, Mazes will not be included if the other five subtests are administered for the Performance Scale to calculate the IQ.

3.3.3.2 Validity and Reliability of WISC-R

a. Validity.

The essential criterion for the selection of any intelligence test is the validity of its score. In short, validity is how one may be sure that a given test is a good measure of intelligence. The two types of validity most sought after in an intelligence test are content or construct validity and concurrent validity.

i. Construct Validity.

Wechsler acknowledged some of the problems in classifying intelligence. This arises due to fact that measures of intelligence are not as precise and as objective those measuring physical phenomena (Edward, 1972). By assuming general intelligence is on a continuum, Wechsler (1974) proposed a classification system of intelligence based on frequency of occurrence in the normal population. The six classifications of intelligence level in the WISC-R are very superior, superior, high average, average, low average, borderline, and mentally deficient (Table 3.1a).

Table 3.1a

Intelligence Classifications of WISC-R

IQ	Classification	Theoretical Normal Curve(%)	Actual Sample(%)*
130 and above	Very Superior	2.2	2.3
120-129	Superior	6.7	7.4
110-119	High Average	16.1	16.5
90-109	Average	50.0	49.4
80-89	Low Average	16.1	16.2
70-79	Borderline	6.7	6.0
69 and below	Mentally deficient	2.2	2.2

Source: Wechsler (1974), p.26

*The percent shown are Full Scale IQ, and are based on the sample (N=2200). The percent obtained for Verbal IQ and Performance IQ is essentially the same.

ii. Concurrent Validity

The usual procedure for concurrent validity of a standardised test is to correlate the score with some established test. The correlation coefficient of WISC-R with other intelligence tests (WPPSI, WAIS and Stanford Binet) ranges from 0.51 to 0.95 and is shown in table 3.1b. Thus, the WISC-R IQ score for the age group among 6 to 16 years has a high correlation with other intelligence tests. This indicates that the WISC-R and the other intelligence tests are therefore apparently measuring a similar construct of intelligence.

Table 3.1b

Coefficients of Correlation of IQs on WISC-R with IQs on the WPPSI*, WAIS** and Stanford-Binet***

WISC-R Test	WPPSI	WAIS	Stanford-Binet
Verbal IQ	.73	.94	.66
Performance IQ	.78	.79	.51
Full Scale IQ	.82	.95	.63

Source: Wechsler, 1974 p 49, 50 and 52.

*WPPSI is Wechsler Preschool and Primary Scale of Intelligence at Age 6 years, 0 month (N=50).

**WAIS is Wechsler Adult Intelligence Scale at age 16 years, 11 months (N=40).

***Form L-M, 1972 Norms at age 12 years, 6 months (N=27).

b. Reliability.

According to Mehrens and Lehmann (1984), to make long-range predictions, the test score must have two important kinds of reliability estimate; these are internal consistency and stability. The WISC-R manual reports a split-half procedure to establish reliability estimates for internal consistency and test-retest procedure for the stability estimate.

i. Measure of Internal Consistency

As indicated by Table 3.1c, the WISC-R score has a sufficient internal consistency estimate to be used as a basis for predicting intelligence. On average, the reliability coefficient ranges from .70 to .96. The standard error of measurement, where the true IQ score is supposed to lie, is between plus and minus three points of the test score. Suppose a child has a WISC-R score of 105, then one has 95% confidence that a child's true IQ is between 102 to 108.

Table 3.1c

Reliability Estimates and SEM
for Age 11.5 years of WISC-R

Subtest	Age 11 1/2* r	SEM	Average** r	SEM
Info	.88	1.00	.85	1.19
Com	.81	1.37	.81	1.34
Arit	.81	1.29	.77	1.38
Sim	.86	1.18	.86	1.15
Voc	.83	1.21	.77	1.39
PC	.80	1.37	.77	1.45
PA	.73	1.50	.73	1.57
BD	.89	1.08	.85	1.17
OA	.72	1.67	.70	1.70
Cod	.79	1.38	.72	1.63
Verbal	.95	3.34	.94	3.60
Perform.	.91	4.39	.90	4.66
Full Scale	.96	2.98	.96	3.19

Source: Wechsler, 1974 p28 and p30

*N=200
**N=2200 (Age 7 to 16 year)

ii. Measure of Stability

The stability of WISC-R score is assessed by using a test-retest procedure over an interval of one month with a sample of 102 children (between 10.5 to 11.5 years old). The test-retest score correlation ranges from .70 to .95 (Table 3.1d). As expected, the test score for the second assessment is higher than the first assessment but there is no significant difference.

Table 3.1(d)

Stability Coefficient of the Tests and IQ
for Children Aged 10 1/2-11 1/2 years
(N=102)

Subtest	First Testing Mean	SD	Second Testing Mean	SD	r	corr r*
Info	9.9	2.4	10.6	2.6	.81	.86
Sim	9.5	2.8	10.3	3.2	.81	.85
Arit	9.8	2.6	10.6	2.8	.82	.85
Voc	10.0	2.9	10.3	2.8	.81	.81
Com	10.2	2.8	10.5	2.8	.81	.81
PC	9.7	3.1	10.9	3.1	.84	.82
PA	9.9	3.2	12.0	3.3	.72	.69
BD	9.6	3.0	10.8	3.1	.85	.86
OA	9.7	2.9	11.3	3.1	.70	.72
Cod	10.2	3.0	11.7	3.1	.77	.77
Verbal IQ	99.0	13.4	102.4	13.8	.93	.95
Perform IQ	98.5	13.9	109.3	16.3	.88	.89
Full IQ	98.6	13.7	106.2	15.1	.95	.95

Source: Wechsler, 1974 p32

*corrected correlation

3.1.2 Raven's Standard Progressive Matrices (SPM).

3.1.2.1 Description and Administration.

Raven's SPM was first published in 1938 and designed to assess mental ability with persons of all ages, diverse educational and cultural backgrounds. The scale consists of 60 items divided into five sets of 12 items. The tester is required to apprehend meaningless figures that demand a systematic method of observation and reasoning. According to the manual, the person's cultural and educational background has relatively little influence on his score.

Raven's SPM can be administered either individually or in a group. It also can be a timed or time free test. In this study, the researcher administered Raven's SPM as a group and untimed intelligence test. Before the test begins, each pupil has a set consisting of a test book, a record form, a pencil and an eraser. The respondents took 35 to 45 minutes to complete the test.

3.1.2.2 Reliability and Validity

a. Reliability.

The Raven's SPM was initially standardised with British people aged from 6 to 65 years old. The 1977 manual reported that nearly 30 reliability studies were documented in the literature with wide age-range, diverse cultural backgrounds and mental condition from samples all over the world.

The internal consistency measure of Raven's SPM, using the split-half procedure, ranges from .60 to .97. The stability coefficient of Raven's SPM ranges from .55 to .84, with some studies indicating that the stability index for a year was around 0.82. On the basis of these data, Raven's SPM evidently has convincing potential as a screening instrument for giftedness.

b. Validity.

The manual reports the correlation of Raven's SPM score with the Binet and Wechsler score ranges from .54 to .86. The correlation with the non-verbal or performance part of an intelligence test ranges from moderate to high (between .6 to .9). As expected, the correlation with the verbal intelligence and vocabulary tests tend to be below 0.7. The correlation with standardised achievement tests and teacher made tests are generally lower than correlation with intelligence tests. These data suggested that Raven's SPM is measuring a similar construct as intelligence tests such as the WISC-R do. Raven (1979) asserted that prominent psychologists like Spearman and Vernon even proposed that Raven's SPM is the purest and the best measure of 'g', a general intellectual functioning underlying the intelligence, available.

3.2 Teacher and Parent Rating Scale.

3.2.1 Scale for Rating Behavioural Characteristics of Superior Students (SRBCSS).

3.2.1.1 Description and Administration.

A Scale for Rating Behavioural Characteristics of Superior Students (SRBCSS) was developed by Renzulli, Hartman and Callahan in 1971 with the intention of providing a more objective and systematic instrument to guide teachers in the identification process. Items for the SRBCSS were derived from a comprehensive review of the literature concerning characteristics or traits of gifted children. Each item in SRBCSS had to be supported by at least three separate studies attracting attention to the importance of the behaviour. The final form of SRBCSS consisted of 37 items with four dimensions namely Learning Characteristics (8 items), Motivational Characteristics (9 items), Creative Characteristics (10 items) and Leadership Characteristics (10 items).

Renzulli, Hartman and Callahan stressed that the SRBCSS is a supplementary means to identify giftedness. The SRBCSS is, therefore, to be used in conjunction with existing identification procedures such as an intelligence test since it is intended not to replace them.

3.2.1.2 Reliability and Validity of SRBCSS.

a. Reliability.

The stability of SRBCSS has been established using a test-retest approach and interjudge reliability by asking two sets of teachers to rate the same students (fifth and sixth grades) after an interval of 3 months. As indicated in Table 3.2a, the stability of the rating coefficient ranges from 0.77 to 0.91 and the interjudge reliability index ranges from 0.67 to 0.91.

Table 3.2a

Stability and Interjudge Reliability Correlation for SRBCSS

Scale	Stability (N=78)	Interjudge (N=80)
Learning	.88	.89
Motivation	.91	.85
Creativity	.79	.91
Leadership	.77	.67

Source: Renzulli, Hartman and Callahan, 1971

b. Validity.

It is crucial that a SRBCSS score should be able to discriminate the intellectually gifted from their peers. Renzulli, Hartman and Callahan asked teachers of two special classes to rate each student using the SRBCSS. Compared with other measures of giftedness (intelligence and standardised achievement test), all four dimensions of the SRBCSS (learning, motivation, creativity and leadership) were found to be as effective as other reliable measures such as IQ scores in differentiating gifted children as shown (Table 3.2b). Since the intelligence test produced much bigger statistical difference between groups, Renzulli highlighted that the SRBCSS is not to be used to replace it.

Table 3.2b
Means, SD and F Statistics
of Gifted and Average Children

Variable	Gifted (N=40) Mean	SD	Average(N=40) Mean	SD	F
SRBCSS scale:					
Learning	24.43	6.27	16.00	7.22	41.04**
Motivation	24.43	5.46	17.95	5.50	27.95**
Creativity	25.01	7.64	17.13	4.70	31.43**
Leadership	29.48	5.17	22.33	6.45	29.88**
IQ	136.90	4.73	108.93	9.66	270.55**
Language Test	53.73	3.37	33.25	6.74	267.30**
Mathematics Test	43.80	3.93	31.98	7.88	103.41**

**p<.01

Source: Renzulli, Hartman and Callahan (1971) p212.

The validity of the learning and motivation dimension of the SRBCSS is determined by correlating the scores with standardised test of intelligence and achievement. The Creativity dimension is correlated with the well known Torrence Test of Creative Thinking (TTCT). The other dimension, leadership, is validated by correlating it with a standard sociometric technique developed by Hartman (1969). The standard sociometric technique is a peer rating scale of the student's ability in three constructs namely social, athletic and intellectual.

The correlation coefficient of Learning and Motivation scores with intelligence tests and achievement tests ranges from 0.36 to 0.61. The Creativity scores of SRBCSS correlated significantly with verbal sub-scores of TTCT. There is no significant correlation between the Creative score of SRBCSS and non-verbal TTCT. For the Leadership scale in SRBCSS, the correlation with Standard Sociometric Techniques ranges from 0.75 to 0.84 for fourth and fifth grade students.

3.2.2 Parent checklist

3.2.2.1 Description and administration.

To date, there is no standardised parent checklist used to identify gifted children. In America, various forms of checklist are made available by the educational authorities. Some parent checklists are open ended and some are Likert type rating scales. Inferring from research on parental behaviour in a child's upbringing (Holden and Edwards, 1989), for the parents with lower socio-economic status, a Likert type rating has an advantage over the open ended rating.

The Parent's checklist, proposed by Martinson (1975) for the Council of Exceptional Children, modified by almost all state education authorities in the USA (Lacy, 1979), was used in this study. It has 25 items; twenty-two items of a Likert type and three open ended items. The research assistants interviewed the parents using this rating scale.

3.3 School Failure Tolerance (SFT)

3.1.1 Description and Administration.

The School Failure Tolerance (SFT) scale developed by Clifford (1988) is, in some respects, similar to the Kuhl (1985) Action-Control subscale. Based on the attribution and the achievement theory of motivation, both tests are the revised version of the Rotter (1966) Locus of Control scale. the Locus of Control scale was the most pupular measure of child's personality (Buros, 1978). The SFT is an attempt to measure the extent to which an individual responds constructively to failures or misfortunes through self-report. Contrary to Kuhn's Action-Control subscale developed for adults, SFT focuses on school failure primarily for 7- to 17-year-old school children.

The SFT consists of 27 items with a 6-point agree-disagree Likert scale. It yields three subscale scores: Feeling about Failure (Affect or Aff), Action about Failure (Action or Act) and Preferred Task Difficulty (PD). The time taken to administer SFT is about 25 minutes with the researcher reading aloud every item to the children.

3.3.2 Reliability and Validity.

a. Reliability.

The SFT was standardised using 233 students aged 10 to 12 years old enrolled in two separate public schools in a

mid-western state of the USA. The alpha coefficient for the original 36 items is 0.90. For the SFT subscale, the alpha coefficient for Affect, Preferred Difficulty and Action is 0.85, 0.88 and 0.80 respectively.

The SFT was translated and administered to 194 fourth grade Taiwanese students (Clifford and Chou, 1991). The translated version of SFT has reliability of 0.87. The reliability for the subtests is 0.72 for the Affect, 0.82 for the Preferred Difficulty and 0.86 for the Action.

b. Validity.

Responses to the original 56 items in the SFT scale were analysed using factor analysis with varimax rotation. The analysis resulted in three factors that are namely Affect, Preferred Difficulty and Action. Items with minimal factor loading of 0.40 were retained. In the final form of SFT, each subscale contains nine items.

The SFT score was validated using selected items from well-known achievement tests; the Iowa Test of Basic Skills (ITBS) and the Iowa Test of Educational Development (ITED) which formed an inventory called Academic Risk-Taking (ART) Measure. The ART consisted of mathematics, spelling and vocabulary. The SFT has modest correlation with ART. For the fifth grade (11 years old) the correlation coefficient is 0.48 ($p<0.001$) for vocabulary, 0.41 ($p<0.001$) for spelling and 0.37 ($p<0.001$) for mathematics.

3.4 Achievement Test (UPSR-Primary School Assessment Test)

After introducing automatic admission to secondary education from primary education in 1960, the Ministry of Education in Malaysia introduced two standardised examinations during primary education. They are standard three assessments and standard five assessments. These assessments were intended to be diagnostic assessments. Since the ministry was not prepared to conduct a remedial programme: the standard three assessment was abolished in 1965. The standard five assessment then became a summative examination. There were five subjects in the standard five assessment: Malay, English, Mathematics, Science and History.

In 1983, the Ministry of Education introduced the New Curriculum for Primary Schools, which emphasized three basic skills: Reading, Writing and Arithmetic. The standard five assessment was replaced by Primary School Assessment or UPSR and administered at the end of standard six. The subjects tested by UPSR are Malay Language (Comprehension, Essay and Oral), English and Mathematics. In 1988, an additional test, that is an Entrance Test for the selection of students for residential schools, was introduced. The Ministry of Education has not provided any information regarding the Entrance test. The Entrance Test score was not reported to the pupil.

The Ministry of Education has made available, to the researcher, the scores of the Malay (total score for comprehension, essay and oral), English, Mathematics and the Entrance Test of the respondents.

PART II: The Suitability of the Instruments

3.5 Rationale and Objectives.

The objective of the initial study was to determine the stability and, to some extent, the validity of the instruments namely the WISC-R, Raven's SPM, SRBCSS, Parent Rating Scale and SFT. Bearing in mind that the instruments have been developed in Great Britain and America, it is essential to undertake a study to ascertain that the Malay versions of these instruments have the ability to identify intellectually gifted children.

3.6 Translation Procedure.

3.6.1 Translation Panel

With the exception of Raven's SPM, the English versions of WISC-R, SRBCSS, Parent Rating Scale and SFT were initially translated into Malay by the researcher and then given to a translation panel that comprised 5 local experts: two associate professors in Malay Studies, two lecturers in Educational Psychology and a teacher with 12 years experience teaching Malay children in a rural area (see Appendix I).

3.6.2 Item Analysis and Back Translation

After receiving separate comments from each translation panel member, the researcher made the necessary amendments to the wording and concepts (mostly found in

WISC-R) suggested by the panel. The WISC-R and SFT were then administered to a class of 25 primary six pupils in a school near to Universiti Pertanian. The respondents were instructed not only to respond to every item but also to mark any item that they did not understand. Four teachers appraised five pupils identified randomly from the above group of pupil respondents using SRBCSS. Thirty parents (15 mothers and 15 fathers) were interviewed by two research assistants at their houses. As almost all parents are Muslim, the mother has to be interviewed by the female research assistant and the father by the male research assistant.

On the WISC-R, all pupils indicated that they understood the items. Four items in SFT, namely item 2, item 10, item 13, and item 21, needed rewording. The teachers indicated no difficulty in administering the SRBCSS. Two items (item 4B and item 20) from the parent rating scale needed rewording. The parents found them difficult to understand.

The final Malay versions of the WISC-R, SFT, SRBCSS and parent rating scale (as in appendix II-V) were given to five final year Bachelor of Education (Teaching of English as Second Language) students in Universiti Pertanian Malaysia. They translated each item in the instruments back into English. This 'back translation procedure' is essential to ensure that the content of the final Malay version of these

instruments had not deviated from the original English version. From the back translation, the researcher found that only one item had been mistranslated. In the WISC-R item 18 of the Vocabulary sub-test, where the concept of `fable', had been translated as `lagenda' which means `heroic act'. It was therefore changed to `dongeng', which means 'fairy tales or folk story'.

3.7 Pilot Study

3.7.1 Respondents and Administration of Instruments.

One hundred pupils of primary six comprising of 53 boys and 47 girls, four teachers and 30 parents from a single school in Rembau, which is a neighbouring district where the main study was conducted, were the respondents for this pilot study. The Raven's SPM and the SFT were administered to the pupils during the first visit to the school. Fifteen pupils (7 boys and 8 girls) randomly chosen from the Raven's SPM score were chosen for the teachers to appraise using SRBCSS. Later, their parents were interviewed in their homes by two research assistants. The researcher administered the WISC-R to an average of seven pupils a day after the first visit. After a lapse of 30 days, 50 pupils, randomly selected from the rank order of Raven's SPM score, sat another Raven's SPM. Using a similar procedure, 30 pupils sat another WISC-R.

3.7.2 The Findings:

a. Intelligence Tests.

i. Raven's SPM.

The data obtained from the 100 respondents in this study indicate that the Raven's SPM has moderately high reliability. Using Cronbach Alpha to determine its internal consistency, Raven's SPM has a reliability of 0.76, with the standard error of measurement of 3.8 (at 95 percent confidence interval). A test-retest correlation of 50 pupils after 30 days of initial administration produced a stability coefficient of 0.77.

As for the descriptive statistics of Raven's SPM, the mean score was 40.88 and the standard deviation was 7.75. The scores ranged from 23 to 58. The median was 42 and the mode was 43. From the frequency distribution, the Raven's SPM score is slightly negatively skewed. On average, the girl's score is higher than the boy's, but there is no significant difference between the mean scores of two genders (Table 3.3).

Table 3.3
Gender Differences on Raven's SPM

Gender	N	Mean	SD	t	sig.
Boy	53	39.57	9.10	-1.82	0.072
Girl	47	42.36	5.62		

ii. The WISC-R

Inferring from the statistics in Table 3.4a, the WISC-R total scores and its sub-test scores are very close to a normal distribution. A close scrutiny of the means of the sub-test scores indicated that they are generally close to the 'western' values as published in the 1974 manual (which reported the mean as 10 and the standard deviation as 3 for each subtest). The subtests that have the mean lower than the value published in the manual are Com and OA and in the case of BD and Cod, their mean is comparatively higher. T-test statistics indicate that the differences are not significant.

Table 3.4a

Descriptive Statistics of the Malay version WISC-R (N=100)

Subtests	Mean	SD	Median	Mode	Kurtosis
Info	10.98	2.54	11	12	.63
Sim	9.49	2.98	10	10	-.15
Arit	10.87	3.01	11	13	-.13
Voc	9.27	3.18	10	10	1.48
Com	9.95	3.67	8	9	-.29
PC	10.31	3.37	10	10	-.05
PA	11.25	3.68	11	14	-.26
BD	11.01	2.97	12	13	.12
OA	9.56	4.03	9	11	-.46
Cod	10.18	3.21	10	10	.66
Verbal	49.13	11.31	52	54	.08
Performance	52.32	11.29	53	56	.02
Full IQ	103.12	14.92	104	101	-.28

The WISC-R score showed that the sub-tests had modest internal consistency reliability (Table 3.4b). The Cronbach alpha values ranges from 0.65 to 0.89. As the number of items for each subtest is between 4 to 30, no greater Cronbach alpha values can be expected. Thirty respondents randomly chosen from the rank order of initial WISC-R administration retested after a lapse of 30 days has a correlation between 0.81 to 0.95. Although the scores of the second administration are higher than the initial administration, there are no significant differences indicated by the t-test results for each subtest.

Table 3.4b
Reliability* of the Malay version of WISC-R

Subtest	No of Items	Initial Mean (N=30)	SD	alpha	After 30 Days Mean (N=30)	SD	r	SEM	t
Info	30	10.98	2.54	.75	11.33	2.63	.81	1.68	-0.65
Sim	17	9.49	2.98	.66	9.71	2.51	.76	2.23	-0.41
Arit	18	10.87	3.01	.86	11.66	2.96	.86	1.52	-1.28
Voc	32	9.27	3.18	.89	10.09	2.88	.86	1.78	-1.33
Com	17	9.95	3.18	.84	10.50	2.05	.84	2.01	-1.13
PC	26	10.31	3.37	.87	10.72	2.66	.88	1.66	-0.71
PA	12	11.25	2.97	.65	12.11	2.87	.73	1.80	-1.43
BD	11	11.01	2.97	.78	11.56	3.00	.81	1.84	-0.89
OA	4	9.56	4.03	.74	10.75	3.66	.79	2.72	-1.52
Cod	93	10.18	3.21	NA	11.12	3.33	.83	1.79	-1.36
Verbal		49.13	11.3	.89[1]	52.74	10.8	.90	5.17	-1.59
Performance		52.31	11.3	.87[1]	57.06	12.0	.91	5.57	-1.63
Full IQ		103.12	14.9	.91[1]	106.77	13.9	.91	6.19	-1.24

* Calculations based on Cronbach Alpha except in for Cod
[1] where it was calculated based on test-retest procedure.
Excluding Cod.

A close scrutiny of the gender differences of the WISC-R scores (Table 3.4c) indicated that it is only in the Arithmetic subtest where the scores for boys are significantly higher than for girls. This is a common phenomenon, where boys are better than girls in Mathematical skills and achievement (Maccoby and Jacklin, 1975).

Table 3.4c

Gender Differences of the Malay Version WISC-R Score (Boys=53 Girls=47)

Subtests	Gender	Mean	Std. Dev.	t
Info	Boy	11.08	2.60	.40
	Girl	10.87	2.49	
Sim	Boy	9.41	3.42	-.27
	Girl	9.57	2.42	
Arit	Boy	12.55	2.71	2.18*
	Girl	11.26	3.16	
Voc	Boy	9.23	3.59	-.14
	Girl	9.32	2.68	
Com	Boy	7.75	3.59	-.15
	Girl	8.17	3.55	
PC	Boy	10.58	3.42	.87
	Girl	10.00	3.31	
PA	Boy	11.26	2.74	.02
	Girl	11.25	2.66	
BD	Boy	12.55	2.98	1.95
	Girl	11.40	2.87	
OA	Boy	8.39	4.24	-.43
	Girl	8.74	3.83	
Cod	Boy	12.75	3.35	-1.42
	Girl	13.66	3.02	
Verbal IQ	Boy	48.38	11.97	-.70
	Girl	49.98	10.58	
Performance IQ	Boy	55.17	12.55	-.14
	Girl	55.49	9.80	
FULL IQ	Boy	102.66	16.73	-.33
	Girl	103.64	12.74	

*p<0.05

The inter-correlation coefficients of WISC-R subtests are modest, ranging from 0.2 to 0.6 (Table 3.4d). The correlation coefficients of verbal subtests with verbal IQ are generally higher than the correlation coefficients of performance sub-tests with performance IQ. As expected, verbal IQ and performance IQ are strongly correlated with the Full scale IQ, with values of 0.92 and 0.89 respectively. It can be concluded, therefore, that the Malay version of the WISC-R is similar to the original version in determining IQ.

Table 3.4d

Inter-correlation Coefficient*
of the Malay version WISC-R subtest
(N=100)

Sub-tests	1	2	3	4	5	6
Verbal:						
1. Info						
2. Sim	49					
3. Arit	20	30				
4. Voc	47	43	33			
5. Com	45	50	44	58		
6. VERBAL	68	75	59	77	79	
7. FULL IQ	64	73	50	73	72	71
Performance:						
1. PC						
2. PA	39					
3. BD	46	29				
4. OA	37	43	40			
5. Cod	21	30	25	31		
6. PERFORMANCE	71	68	66	74	60	
7. FULL IQ	57	59	65	57	92	89

All r are significant at $p<0.01$
*decimal point is omitted

b. The SFT

The internal consistency reliability of SFT is modest. The Cronbach Alpha coefficient for all 27 items is 0.6. A Cronbach Alpha coefficient of 0.75 can be obtained if 3 items are deleted. Therefore, the deletion of these items will also improve the reliability. The reliability for Affect increases to 0.60 from 0.55, for Preferred Difficulty to 0.67 from 0.59 and for the action to 0.55 from 0.43. As these three items shared a common feature, that they are all negatively worded, the deletion of these items for further administration seemed sensible. The final items for SFT are therefore reduced from 27 to 24.

Table 3.5a
Gender Differences of the Malay version SFT
(Boys=53 Girls=47)

SFT	Boy		Girl		t	sig
	Mean	SD	Mean	SD		
Aff	26.71	7.37	27.22	5.78	-.30	no
PD	37.26	4.81	35.65	6.29	.31	no
Act	28.67	5.14	26.30	3.84	.08	no
Total	92.63	9.79	89.17	12.61	1.09	no

The data for the 100 respondents indicates that scores for the SFT (with 24 items) range from 66 to 115. From the descriptive statistics: the mean=91.04, standard deviation = 11.19, median=93.5 and mode=90, the distribution of the SFT score is near normal (has similar score of central tendency

i.e. mean, median and mode). There is no significant difference in the score for the boys and the girls (Table 3.5a). The scores distribution for the sub-tests of SFT, Affect (Aff), Preferred Difficulty (PD) and Action (Act) are also similar to the total scores distribution.

Data from a test-retest procedure (after a lapse of 30 days for 30 pupils) indicates that there is no significant difference in the total score on the SFT. The mean scores for the second administration for the total scores and two subtests (Aff and Act) are higher than the initial administration, but the differences are not statistically significant (Table 3.5b).

Table 3.5b

Test-retest Result of the Malay version SFT
(N=30)

SFT	First		Second		t	r
	Mean	SD	Mean	SD		
Aff	25.51	5.23	27.48	5.88	-1.37	0.79
PD	33.35	5.01	34.98	6.11	-1.12	0.84
Act	26.18	4.12	28.15	4.87	-1.57	0.77
Total	87.03	10.45	88.64	8.88	-1.44	0.89

Critical Region for t (df=28)=2.048 at $p<0.05$

The three subtests of the SFT have modest to high and significant correlations with each other (Table 3.5c). The R square of SFT with its sub-tests ranges from 0.73 to 0.86. Based on these data the SFT and its sub-tests shared more than 70 percent of its variation with its sub-tests in measuring the SFT construct.

Table 3.5c

Inter-correlation of the Malay version SFT with Its Subtests (N=100)

SFT	1	2	3
1. Aff			
2. PD	7418		
3. Act	5401	7597	
4. Total	8581	9337	8693

Note: all are significant at p<0.001

The correlations of SFT scores with intelligence tests (Raven's SPM and WISC-R) are significantly modest ranging from 0.56 to 0.70 (Table 3.5d). The relationship of the SFT score with the WISC-R is stronger than with Raven's SPM.

Table 3.5d

The Correlation of Malay version SFT with Intelligence Tests (N=100)

SFT	WISC-R	Raven's SPM
Aff	.64	.58
PD	.62	.56
Act	.59	.56
Total	.70	.64

Note: All are significant at p<0.001

The median score of the Full scale WISC-R IQ score (that is 104) was used to differentiate those with high IQ (104 and above) with those of low IQ (103 and below). Those who are among the group with high IQ were found to have significantly higher SFT scores than those of low IQ (Table 3.5e).

Table 3.5e

The Differences in SFT score between High and Low IQ

SFT	IQ	Mean	SD	t	p
Aff	High	38.23	6.88	5.29	0.001
	Low	30.69	5.25		
PD	High	39.83	5.31	5.91	0.001
	Low	33.38	5.60		
Act	High	42.15	5.72	5.29	0.001
	Low	35.21	7.36		
Total	High	120.21	15.48	6.83	0.001
	Low	99.27	15.12		

Note: High - N=52
Low - N=48

c. The SRBCSS

Four teachers were each asked to rate 15 pupils (seven boys and eight girls) selected randomly[1] based on the pupils' score on Raven's SPM. The teachers were a teacher of Malay Language, a teacher of English, a teacher of Mathematics and a class teacher.

As for the descriptive statistics (Table 3.6a), SRBCSS score distributions are slightly negatively skewed. The distributions are not normally distributed due to the small number in the sample (four teachers).

Table 3.6a

Descriptives Statistics of the Malay version SRBCSS

SRBCSS	Mean*	Median	Mode	SD	Skewness
Learning	20.11	21.5	25	5.17	-.59
Motivation	17.86	19.0	19	6.15	-.21
Creativity	23.39	24.5	19	6.40	-.51
Leadership	26.67	28.0	31	6.12	-.26
Total	88.03	91.5	91	20.64	-.41

*N=60 (4 teachers x 15 respondents)

[1] The respondents are arranged according to their Raven's SPM score. A pupil is asked to picked a number from one to seven. The first respondent for these 15 pupils was the third highest score of Raven's SPM and the second was the 10th.

The teachers' rating scale has high internal consistency reliability (Table 3. 6b). The total score of SRBCSS has a reliability of 0.97. Its sub-tests reliability ranges from 0.91 to 0.95. It is therefore evident that the Malay-version of the teachers rating scale has enough reliability.

Table 3.6b
Reliability of the Malay version of SRBCSS
Teachers(N=4), Pupils(N=15)

SRBCSS	No of Item	Cronbach Alpha
Learning	8	.9138
Motivation	9	.9400
Creativity	10	.9468
Leadership	10	.9421
Total	37	.9717

Subject teachers consistently rated their pupils. For the four teachers, the internal consistency ranges from 0.89 to 0.92 (Table 3.6c). Based on these information, the teachers' standard error of measurement is calculated and it ranges from 7.6 to 10.2.

Table 3.6c
Mean, SD, Reliability and SEM of Teacher's Rating

Teacher	Mean	SD	Cronbach alpha	SEM*
Malay	89	19.4	.92	7.6
English	85	22.3	.89	10.2
Mathematics	87	20.6	.90	9.0
Class Teacher	91	18.4	.91	7.6

*95% Confidence

The subtests score inter-correlations ranges from 0.4 to over 0.9 (Table 3.6d). Therefore, the variance shared by the sub-tests ranges from 15 to 65 percent. These data confirm that each subtest is measuring related contructs.

Table 3.6d
Inter-correlation of the Malay version SRBCSS subtests

SRBCSS	1	2	3	4
1. Learning				
2. Motivation	.70			
3. Creativity	.86	.83		
4. Leadership	.63	.38	.63	
5. Total	.91	.84	.96	.76

All r are significant at p<0.01

Information in Table 3.6e indicates that teachers favour girls more than boys in two of the subtests, learning and creativity. Boys are generally rated higher than girls on the leadership subtest. There is no gender difference the in motivation subtest and the total score of SRBCSS.

Table 3.6e
Teacher Rating of Boys and Girls

SRBCSS	Boy(N=7) Mean	SD	Girl(N=8) Mean	SD	t
Learning	15.4	4.2	21.6	3.8	-2.97**
Motivation	20.6	3.1	22.5	3.9	-1.03
Creativity	24.7	3.6	28.6	4.0	-1.97*
Leadership	28.6	4.7	22.5	5.1	2.40**
Total	87.2	10.6	93.8	11.3	1.17

*p<0.05
**p<0.01

Using the median score of Full scale IQs from the WISC-R, the pupils were categorised as high IQ (those who are having 104 and above) and low IQ (less than 104). With the exception of the Class Teacher, the other three teachers rated those with high IQ significantly higher than those with low IQ (Table 3.6f). Thus, with the exception of the class teacher, teachers were able to discriminate children with high and low IQs by using the Malay version of SRBCSS.

Table 3.6f

Teachers Rating According to the Pupil's IQ

Teacher	High IQ (n=6) Mean	SD	Low IQ (n=9) Mean	SD	t
Malay	98	20.0	77	18.9	2.04*
English	93	20.8	70	23.1	2.00*
Mathematics	89	20.9	67	20.1	2.03*
Class	95	19.3	82	18.0	1.31

*p<0.05

d. Parent's Rating

Thirty parents (15 mothers and 15 fathers) were interviewed by the research assistants separately in their homes. They were the parents of the pupils rated by the teachers using SRBCSS.

There are 23 items in the parent's rating scale. Using item analysis of the Cronbach alpha, two items, namely item 4B and item 22 were suggested for deletion so that the reliability of the parents checklist could be increased from 0.65 to 0.80.

The deletion of these items resulted in the parents' checklist having a reliability of 0.84 (0.82 for fathers and 0.86 for mothers). The fathers' and the mothers' total score correlation is 0.87. There is no significant difference of rating between fathers and mothers (Table 3.7a).

Table 3.7a

The Difference of Rating between Mother and Father

Parent	N	Mean	SD	t	p
Father	15	72.40	7.29	.08	.935
Mother	15	72.20	5.87		

With the remaining twenty items, the parents' checklist total score has a mean of 72.30 (an average of 2.6 on each item) and SD of 6.5. As for the mode and the median of the parents' checklist total score is 74. The total score distribution is therefore slightly negatively skewed. From the above data, the calculated standard error of measurement of the parents' checklist is 3.2 (at 95 percent confidence interval).

It is also interesting to note that children's gender has no effect on parents rating (Table 3.7b). Although daughters are rated higher than sons by both father and mother, there is no significant difference in the ratings made by their parents.

Table 3.7b

The Effect of the Child's Gender on Parent's Rating

Parent	Daughter(N=8) Mean	SD	Son(N=7) Mean	SD	t	p
Father	72.1	8.2	70.3	7.1	0.44	ns*
Mother	72.2	6.7	71.8	5.1	0.12	ns

*ns=not significant

Parents are also able to differentiate between low and high IQs by using the rating scale. As shown by information in Table 3.7c, those children who have high IQ are rated significantly higher than those who are having low IQ.

Table 3.7c

Parent's Rating according to the Child's IQ

Parent	High IQ (n=6) Mean	SD	Low IQ (n=9) Mean	SD	t
Father	79.5	6.5	72.2	7.2	1.98*
Mother	81.3	7.1	74.1	5.3	2.13**

*p<0.05
**p<0.01

3.8 Conclusion

Comparing the data published in the manuals and the findings of the study regarding the reliability and stability of the instruments to be used in this research (Table 3.8), it can be concluded that the Malay version of these instruments are of comparable reliability to the original instruments. Since the sample is a small group, the variations in the findings are to be expected. Interestingly, in some instruments like SRBCSS, the reliability is greater. The Malay version of SFT in contrast has a weaker reliability.

Table 3.8
The Comparison of Reliability between Malay and Original Version of Instruments

Instruments	Reliability	
	Malay	Original (English)
WISC-R	.91	.70 to .96
SRBCSS	.97	.77 to .91
SFT	.75	.90
Parent Checklist	.80	na
Raven's SPM*	.77	.60 to .96

note: na - not available
*not translated into Malay

As certain authorities suggested (NFER, 1977), for an individual prediction, a reliability of 0.9 is sought from the instruments. The Malay version of WISC-R in this case had test-retest reliability of 0.91 and meets this criterion. Raven's SPM, which is being considered as a group screening measure, had a reliability of 0.77 in the trial group of 100 children. Further analysis so to ensure that all intellectually gifted are screened in by the Raven's SPM has to be carried out. The details of this analysis is presented in the first part of Chapter 4. As for other measures (SRBCSS, SFT and Parent Rating Scale), the reliability figures accord well with the reliability coefficients of the English version (see table 3.8). On the basis of these data, it can be therefore concluded that the usage of these instruments is justified.

CHAPTER IV

RESEARCH METHODOLOGY, DATA COLLECTION AND ANALYSIS

4.0 Preamble

As in Chapter 3, this chapter is also divided into two parts. In the first part, the rationale for a screening measure for selecting respondents and the technicalities regarding the administration of such a measure are presented. Following that, the remaining part of this chapter describes the selection of the location where the study was conducted, the time table for data collection and the statistical analysis of the data.

Part I - The Screening Measure for the Selection of Respondents

4.1 Rationale for Screening Measure.

There are two essential elements that are crucial to educational research methodology: the stability of the instruments and the sample of the respondents. The stability of the instruments used to generate data has been highlighted in chapter three.

There are two main considerations which concern the nature of the sample in the research study: they are sample size and representativeness. The issue of representativeness of the sample for this study will be discussed in the second part of this chapter.

Sample size is essential for the statistical analysis and for generalising the findings of the study. For an exploratory study, a large sample size is desirable (Isaac and Michael, 1982) so as to allow the use of statistical analyses, such as multiple regression, where a minimum sample size of 60 is needed to obtain an optimum regression line (Hays, 1981).

The criterion for intellectual giftedness in this study is IQ scores derived from the WISC-R. Since the time taken to administer the WISC-R to a respondent is about one hour, for the three month period that is between July to September, 1991 (after the school session for the particular year is over), the researcher had the opportunity of administer WISC-R to about 350 respondents (at the rate of 5 respondents per working day). Therefore, the number of intellectually gifted among the 350 respondents will likely be only 35 (top ten percent of 350).

However, if a screening measure is available and can be effectively utilized respondents for the study can be drawn from a larger sample. Then the probability of having a

larger number of intellectually gifted children is higher. Since the respondents are to be selected from a larger sample, the generalisibality and the utilization of the findings can be enhanced.

In the literature survey, group intelligence tests have been widely used as screening to identify intellectually gifted children for educational and research purposes (Martinson and Lessinger, 1960; Pegnato and Birch, 1959; Rust and Lose, 1980). With the information provided by the screening measure, only those who are likely to fulfil the criterion are referred. It is worthwhile to explore this possibility by replicating the previous studies in this research. If a group intelligence test is able to discriminate high intelligence in Malay children, then, the respondents of this study can be drawn from a larger sample of children.

4.2 The Objective.

The sole objective of this part of study is to explore the feasibility of using Raven's SPM as a screening measure. To serve as screening measure, Raven's SPM score must be able to predict the IQ scores. Using the effectiveness and efficiency indices proposed by Pegnato and Birch in 1959, a decision regarding a cut-off score which can discriminate a reasonable number of respondents and at the same time, be free from the 'false negatives', can be made.

4.3 The Procedure

The proposed measure for screening is Raven's SPM and the criterion for the classification of intellectually gifted children is Full scale IQ score of WISC-R. The WISC-R and the Raven's SPM scores (in Part II of Chapter Three) were analysed to determine whether Raven's SPM can be used to screen intellectually gifted Malay children.

4.4 The Findings

4.4.1 The Correlation between Raven'SPM with WISC-R.

The correlation of Raven's SPM with the WISC-R score was in the range 0.73 to 0.80 (Table 4.1). This correlation is perhaps a little lower than expected (for individual selection a correlation of .90 is preferred). But, with a sample size of 100 children from a school, these correlations might have been anticipated. With these correlations, the R square (shared variance between Raven's SPM and WISC-R) are in the range of 54 to 67 percent. These data indicate that Raven's SPM score has a fair share with WISC-R in measuring the `intelligence' construct.

Table 4.1
Correlation of Raven's SPM with WISC-R
(N=100)

WISC-R	Raven's SPM	Shared Variance (%)
Verbal	.7368	54
Performance	.7798	61
Full IQ	.8155	67

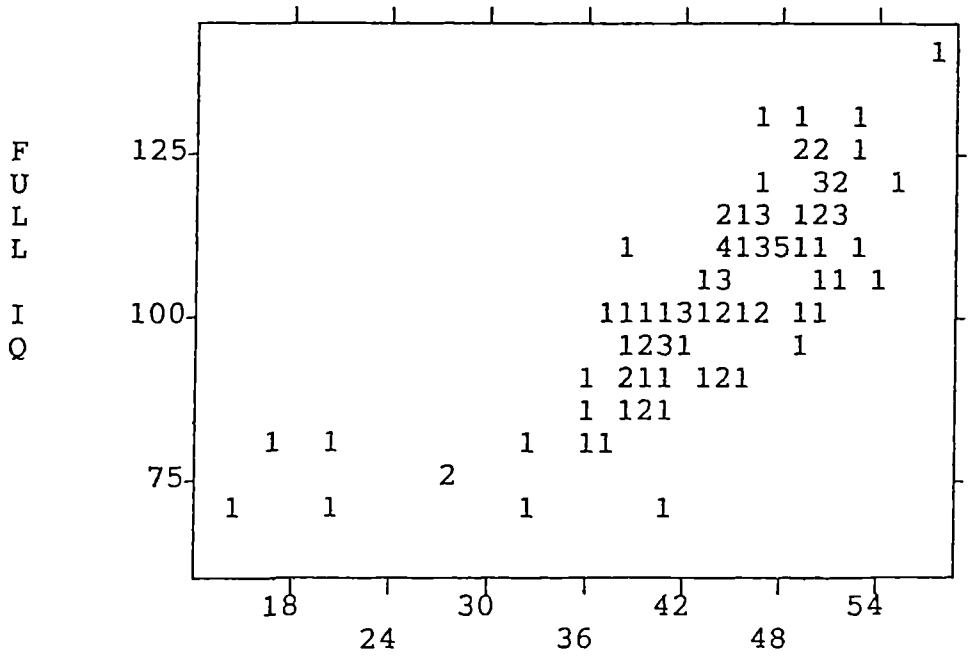
4.4.2 Regression Equation to Predict Intellectual Gifted

Having established that both measures (Raven's SPM and WISC-R) are measuring a similar construct and their relationship is linear (Graph 4.1), it can be concluded that Raven's SPM score can be used to predict IQ score. Thus, using using SPSS software, the regression equation for the purpose of predicting a WISC-R Full scale IQ score may be calculated as:

$$IQ = 1.56(\text{Raven's SPM}) + 40.32.$$

The Multiple R square for this regression equation is .67 ($p<0.0001$) and the Standard Error (SE) is 8.5.

Graph 4.1
The Relationship between Full scale IQ on WISC-R and Raven's SPM



In this study, intellectually gifted children are being defined as those who have an IQ (Full scale IQ of WISC-R) of at least 120. From the above regression equation, the Raven's SPM score of 50 is to be suggested as the score for screening (Table 4.2) as those who have a score of 50 are likely to have an Full scale IQ of 118.5

Table 4.2
Raven's SPM score and Predicted IQ

Raven's SPM		Gifted	Predicted Full IQ	Range*
Score	N(%)			
52	6	2	121.2	112.7-129.7
50	22	6	118.5	110.0-127.0
48	30	12	115.4	106.9-123.9
46	40	14	112.2	103.7-120.7

*±Standard Error of Prediction

However, since the regression equation's standard error of prediction is around 8.5 points, there will be some false negative (the intellectually gifted who have Raven's score less than 50). Using the information from the Figure 4.1 and Table 4.2, there are 22 children having a score of at least 50 on the Raven's SPM. among the 22 respondents who have Raven's SPM score of 50 and above, only 6 are intellectually gifted (having Full scale IQ score of 120 or more). Due to the standard error of prediction, out of 14 intellectually gifted, eight intellectually gifted had a Raven's SPM score of below 50. Therefore, a Raven's SPM score lower than 50 has to be recommended so as to reduce the false negatives.

4.4.3 The Cut-off Score for Screening.

In the sample of 100, there are 14 respondents that can be classified as intellectually gifted (having a Full scale IQ of 120 or more). Thus, the effectiveness and the efficiency indices (Please refer section 1.4.4 of Chapter 1 for details) proposed by Pegnato and Birch (1959) can be used to determine a cut-off score that will include all gifted children and be feasible (in terms of cost and time).

Data in Table 4.3 indicate that a score of 46 has 100 percent effectiveness because it includes all children found to be intellectually gifted on the WISC-R. With 35 percent efficiency, it is anticipated that one-third of those who are referred will fulfil the criterion of being intellectually gifted. The score of 46 is also feasible because it retains only about 40 percent (40 out of 100 respondents) of the sample.

Table 4.3
The Effectiveness and the Efficiency of Selected Raven's Scores

Raven's Score	SPM N	Gifted Included (N=14)	Effectiveness %	Efficiency %
52	6	2	14.3	33.3
50	22	6	42.9	27.3
48	30	12	85.7	40.0
46	40	14	100.0	35.0

4.4.4 Conclusion

The findings of this study suggested that a minimum score of 46 on Raven's SPM is an effective and an efficient cut-off score for screening intellectually gifted Malay children. This score will refer about 40 percent of children for the full administration of WISC-R. Probably, one in three children referred may be confirmed as intellectually gifted children.

In Malaysia, in each district, there are about one thousand Malay candidates sitting for UPSR (primary six). Thus, all Malay children in a particular district can be selected as a sample. Using Raven's SPM with all primary six pupils in a given district, a likely sample of 400 would emerge for individual assessment with a full range of WISC-R. Thus, there would be a possibility of having a sample of 140 (35 percent of 400) gifted children.

Part II - Data Collection and Statistical Analysis

4.5 Place of study and sample

4.5.1 The selection of the District

Malaysia practises a centralised system of administration and the smallest unit of administration is a district. The selection of a district which is representative of Malaysia has been done with the help of computers in the Statistics Department and Socio-economic Research Unit in the Prime Minister's Department. Statistics such as the Malay population's median for income per household, education level of parents, occupation, age of adults (parent) and number of children per family are used as parameters. The two computers then suggested two districts, Temerloh in the state of Pahang and Tampin in the state of Negeri Sembilan. Tampin district was selected for this study as the researcher was familiar with that area.

4.5.2 The Description of the Malays in the Selected District

Data describing Malays in Malaysia and in Tampin district were obtained through the Statistics Department and is presented in Table 4.4. Besides local dialect, a close scrutiny from this information suggests that Malays in Tampin district are similar to other Malays in Malaysia.

Table 4.4

Malays in Tampin: A Comparison of Statistics*

Description	Malays	
	Tampin	Malaysia
Age:		
Mother	47	46
Father	52	54
Years of Education:		
Father	9	9
Mother	6	6
Family Size+	5	4
Household Income	350	480
% Rural	83	79
% below poverty	19	27

*The statistics quoted are Medians except for Rural and Poverty

+Nuclear Family (Father, Mother and Children).

4.5.3 The Schools in the Selected District

There are 16 primary schools in this district. Three schools are categorized by the Ministry of Education as urban schools and the rest are rural schools (Table 4.5). The Ministry categorised a particular school as urban if the majority of its students reside in the urban area. Data from the Ministry of Education indicated a total of 1047 primary six Malay children attending these schools and they were registered to sit for UPSR in July, 1991. They are the sample for this research study.

4.6 The Selection and the Description of the Respondents.

There are three types of respondents in this study namely primary six Malay pupils, teachers and parents. They are selected on the basis of the pupils' score on the Raven's SPM. Pupils as respondents are those having a Raven's SPM score of at least 46. Then their teachers and their parents are automatically selected as the respondents. It was anticipated that the number of children to be selected as the respondents would be around 420 (40 percent of 1047).

Table 4.5

Distribution of Respondents according to School

SCHOOL	Pupils			Teachers		
	Boy	Girl	N	Male	Female	N
1. SK Tampin*	18	17	35	1	3	4
2. SK Tuanku Besar*	38	19	57	2	2	4
3. SK Tebung	4	4	7	1	1	2
4. SK Dato' Abdullah	14	12	26	3	1	4
5. SK Bt Rokan	4	5	9	2	2	4
6. SK Gedok	-	2	2	1	1	2
7. SK Sg Dua	2	5	7	1	1	2
8. SK Air Kuning	1	3	4	1	2	3
9. SK Bt Jalur	8	11	19	3	1	4
10. SK Jelai I	31	36	67	4	5	9
11. SK Sg Kelamah	5	5	10	2	2	4
12. SK Pasir Besar	9	12	21	1	3	4
13. SK Kg Ladang	2	8	10	1	2	3
14. SK Londah	3	3	5	1	1	2
15. SK Gemas	1	2	3		2	2
16. SK T A Rahman*	11	10	21	3	1	4
TOTAL	149	154	303	27	30	57

*Urban schools

In the first part of this chapter, it was calculated that using a cut-off score of 46 on the Raven's SPM would screen in about 40 percent of the children. However, after the administration of Raven's SPM, the number of pupils having a Raven's SPM score of at least 46 were only 317 or about 32 percent of the total sample. Of these 317, four (4) had to be dropped due to transfer to other place, a further two (2) failed to attend for the WISC-R and another 8 (eight) could not be included due to the unavailability of their parents to be interviewed. Details of the remaining 303 pupil respondents and their 57 teachers are presented in Table 4.5.

4.6.1 The Pupils

Written permission was sought from the 303 pupils' parents before the administration WISC-R and SFT. The average age of these pupils was 11 years and 6 months. As for the boys and girls, the average age was 11.7 and 11.6 years respectively. The majority of the pupils (more than 80 percent) were attending rural schools.

4.3.2 Teachers

All (27 male and 30 female) teachers teaching these 303 pupils participated in the study with special permission from the Ministry and school Heads. They were teaching either one of the examination subjects in UPSR or working as a class teacher. A Class teacher (in England Class

Tutor), besides teaching one of these subject, is responsible for the administration of a particular class. The age of the teachers ranges from 24 to 54 years with 44.7 years as an average. Female teachers are (mean=43.6,SD=7.8) younger than their male counterpart teachers (mean=48.9, SD=6.9).

The breakdowns of the teachers according to their qualifications are as in table 4.6. The categories are built by the Ministry of Education based on the their highest academic qualification. To be a certified teacher, all of them must obtain a Teaching Certificate awarded after they have successfully attended a Teacher Training College for two years. The sampled teacher's teaching experience ranged from 1 to 33 years, with the average length of teaching experience of 20.7 years (SD=8.4).

Table 4.6

Academic Qualifications of Teachers

Qualification	Female N	Male N
Primary Six Certificate	8	3
Lower Cert. of Education	4	7
Malaysia Cert.of Education	16	11
Higher Cert. of Education	2	6
TOTAL	30	27

4.6.3 The Parents

The pupils' parents (father and mother) were interviewed by the research assistants using the Parent Checklist. In the absence of their natural parents, legal guardians were interviewed. Detailed information about their background is as presented in the Table 4.7.

Table 4.7

Background of Parents

Background	Mother (N=303) Mean	SD	Father (N=303) Mean	SD
Age	37.6	6.6	42.7	7.3
Years of schooling	7.1	3.1	8.3	3.0
Income per month*	167.9	94.06**	358.6	150.7

*In Malaysia currency.
**Working mothers only (N=89)

4.7 Data Collection

4.7.1 The Instruments

There were five instruments administered in this study. They were namely: Raven's SPM, WISC-R, SRBCSS, Parent Checklist and SFT. The Raven's SPM, WISC-R and SFT were administered to the children. The children were rated by their teachers using the SRBCSS. The Parent Checklist was used with the parents.

4.4.2 Procedure for data collection

The data in this study was collected by the researcher with the help of one male and one female research assistant. The research assistants are graduates with a Bachelor's Degree from the Universiti Pertanian Malaysia. They were selected from the University's pool of approved research assistants. They have been well trained and involved in numerous studies conducted by the University academic staff, particularly in interviewing techniques. Their last assignment was as enumerators for a nationwide population census conducted three months before. Their main task in this study was interviewing parents using the rating scale. The male research assistant interviewed the fathers and the female assistant interviewed the mothers.

The Raven's SPM, SFT and WISC-R were administered by the researcher. The researcher has been trained by the late Professor Cleary of the University of Iowa, USA, during his study for a M.A. degree to administer psychological tests. The Psychological Corporation, which monitor the use of the WISC-R, allowed him to purchase the WISC-R testing kit.

The data collection for this study was undertaken between July to October of 1991. This was the last term of school for teachers and pupils. The pupils had already taken their UPSR and they were spending the rest of the days with co-curricular activities. Most of the teachers were just supervising the pupils' activities during this term. In view of this situation, the education authority gave permission to conduct the study during and after school hours.

The time table was set by the researcher and approved by the education authority as in the Table 4.8. As for the pupils, the administration of Raven's SPM was conducted on the first visit to each school. They were then scored with the help of the assistants. Those pupils with a score of 46 or higher were identified.

Table 4.8

Time Table for Data Collection

Time	Instruments				
M/Y* W**	Raven's SPM	SFT	WISC-R	SRCBSS	Parent checklist
7/91					
W3	##				
W4		##		##	*
8/91					
W1					*
W2					*
W3			@@		*
W4			@@		*
9/91					
W1			@@		
W2			@@		
W3			@@		
W4			@@		
10/91					
W1			@@		

Note: *Month/Year
**Week

On the second visit, pupils with a score of 46 and higher were gathered in one place. The researcher then administered SFT by reading each item slowly. SRBCSS were given to the teachers with the pupil's name clearly written on the top front page. The WISC-R was administered only by the researcher to each individual pupil.

The UPSR scores and grades were obtained after the result was officially announced by the Ministry. The score for Malay Language is a total score of Comprehension, Essay and Oral. Other scores available are English, Mathematics and the Residential Schools Entrance Examination.

4.8 Data analysis

4.8.1 Variables

The variables for analysis derived from the respondents and the instruments are:

a. Respondents' gender.

b. Intelligence Test:

   i. WISC-R sub-tests,
   ii. Verbal IQ
   iii. Performance IQ
   iv. Full IQ

c. UPSR (Primary School Assessment Test)

   i. Malay Language
   ii. English
   iii. Mathematics
   iv. Residential Schools Entrance Test (Entrance)

d. Teacher's Rating Scale (SRBCSS):
   1. Subtest score

      i. Learning
      ii. Motivation
      iii. Creativity
      iv. Leadership
      v. Total score

   2. Teachers

      i. Malay Language
      ii. English Language
      iii. Mathematics Teacher
      iv. Class Teacher

e. SFT (Pupils Self Rating)

   i. Affect
   ii. Preferred Difficulty
   iii. Action
   iv. Total score

f. Parent Rating Scale

   i. Father
   ii. Mother

4.8.2 Statistical Analysis

The statistical analysis was done using a computer software package known as SPSS or Statistical Package for Social Sciences available through the University of Hull Computer Centre. Descriptive statistics, such as frequency, mean, standard deviation (SD), mode, mean, median and kurtosis for every variable were closely scrutinised as they form the basis on which to judge that the score for each variable is normally distributed. The normality is crucial as it is one of the assumptions for inferential statistical tests such as t-test, multiple regression and Discriminant Function Analysis.

4.8.3 Data Presentation.

The descriptive statistics (mean, mode, median and kurtosis) for every variable are reported in chapter 5. To some extent, the differences between the mean of the intellectually gifted and non-intellectually gifted are also discussed. Chapter 5 also includes the correlation coefficients among the variables of the study.

Under the present system, the grades achieved in UPSR are used as a criterion for selecting `bright Malay children' for places in residential schools. In chapter 6, using data generated in this research, the effectiveness and the

efficiency of the current procedure will be evaluated. The evaluation of the current procedure in terms of effectiveness and efficiency is necessary in order to establish judgement against which any new proposal (which may consist of other measures) can be compared. Only after such a comparison could valid suggestions and proposals be offered to the education authorities.

If the current procedure of selecting `bright Malay children' is found not to be effective and efficient, then the data could be analysed using multiple regression and discriminant function analysis so as to establish which variables or measures should be utilised in order to achieve an effective and an efficient procedure for selecting `bright Malay children'. The result of this data analysis is presented in chapter 7.

CHAPTER V

THE DESCRIPTIVE STATISTICS OF THE DATA

5.1 Introduction

Bearing in mind that the respondents for this study were selected on the basis of their Raven's SPM score, it is crucial that the data generated by WISC-R, UPSR, SRBCSS, SFT and Parent's Rating Scale do not violate the most important statistical analysis assumption and that is that the distribution of the scores for each measure is normal. In addition to that, statistical analyses such as multiple regression and discriminant function analysis that are used in this study, require not only normal distribution but a linear relationship among the measures (Magidson, 1992).

There are two criteria for the perfectly normal distribution. The first criterion of a normal distribution is that the measures of central tendency (mean, median and mode) are an equal. The other criterion is the shape of the distribution indicated by the kurtosis and the skewness. For a normal distribution, the kurtosis and the skewness are both zero by definition. As for the relationship between variables, the linearity may be judged from the graph produced by the SPSS using the plot command. Since the scores quantified by the measures used in this study are continuous

and interval in terms of scale of measurement, the strength of the relationship between variables may be calculated using Pearson's correlation coefficient.

In the later part of this chapter, the respondents are categorised according to their gender and intellectual giftedness. As for the other measures (SRBCSS, SFT and Parent's Rating Scale) the respondents are classified into three groups; high, medium and low. The categorisation of the respondents is to determine possible relationships between the mean scores, the gender and intellectual giftedness. Also, the crosstabulation between giftedness and other measures can be computed. This finding will form the basis on which to decide further analysis of the data.

5.2 The Distribution of the Scores.

5.2.1 The WISC-R

The respondents' WISC-R scores were used as the criterion for intellectual giftedness. The WISC-R consists of 10 subtests and reports three types of IQ namely Verbal, Performance and Full scale IQ. The Full scale IQ score is used as the final criterion of intellectual giftedness for this study.

Data in Table 5.1a regarding the distribution of WISC-R scores indicated that the mean for each sub-tests ranges from 9.5 to 12.5. Bearing in mind that the respondents are selected on the basis of Raven's SPM score (having a score of at least 46), they are expected to score higher than the norm published in the manual (mean of 10 for every subtest). Except for Object Assembly (OA) where the mean is only 9.5, the other subtests have an average score of above 10. The distribution scores on each of the subtests, inferred from the kurtosis and skewness (zero for normal distribution), are very close to normal distributions.

Table 5.1a

The Distribution of WISC-R sub-tests.
(N=303)

Subtests	Mean	Median	Mode	SD	Kurtosis	Skewness
Info	11.2	11	12	2.5	.501	-.399
Sim	10.1	10	9	3.1	.067	.296
Arit	12.5	13	13	2.7	-.858	.035
Voc	11.3	11	11	3.5	.657	-.429
Com	11.1	11	10	3.0	-.323	.007
PC	10.9	11	11	2.9	.148	.321
PA	12.3	12	11	2.6	.320	-.126
BD	12.1	12	10	2.5	.429	.359
OA	9.5	10	7	3.1	-.307	.173
Cod	12.5	12	14	2.8	-.090	.015
Verbal	56.2	57	58	11.2	-.192	.010
Performance	57.3	57	61	8.3	-.411	.098
Full	109.3	109	105	12.9	-.492	-.072

The WISC-R produces three IQ scores namely verbal, performance and full scale IQ. The data regarding these scores, presented in table 5.1a, indicated that the distribution of each IQ type is also very close to normally distributed. The mean for Verbal, Performance and Full scale IQ scores among the respondents are higher than the published norm which is 50 for both Verbal and Performance and 100 for Full IQ. As the respondents were chosen among those who have Raven's SPM score of at least 46 (those likely to have high IQ score), on the average they are expected to have higher IQ scores.

The respondents were classified as intellectually gifted if they have a full scale IQ score of WISC-R at least 120. There were 101 respondents, 56 boys and 45 girls, having full scale IQ of 120 and above. The mean for the full IQ score of intellectually gifted respondents was 128 (SD=8.7). There were two respondents having the highest full scale IQ score of 147.

5.2.2 The UPSR

The respondents sat for UPSR in July, 1991. Their scores (Malay Language, English, Mathematics and Entrance Examination) were made available by the Ministry of Education. There are three sub-tests for Malay Language namely comprehension, essay and oral. The Ministry only provided the total score for the three sub-tests of the Malay Language. The respondents' grades for the subjects are taken from their respective schools.

Table 5.1b shows that, with the exception of English, the distributions of the respondents' scores on UPSR are slightly negatively skewed. For the Malay Language, the kurtosis and the skewness are not close to zero. Therefore, the distribution of Malay Language scores is not normal. However, the distributions of English, Mathematics and Entrance Examination scores are sufficiently near normal.

Table 5.1b

The Distribution of UPSR score
(N=303)

UPSR	Mean	Median	Mode	SD	Kurtosis	Skewness
Malay	81.6	84	90	12.5	2.022	-1.275
English	60.1	60	80	19.2	-1.075	.059
Mathematics	68.3	70	64	18.7	-0.689	-0.367
Entrance	74.3	76	80	12.5	-0.127	-0.464

As might be expected from this selected sample, the respondents in this study are not fairly distributed according to the levels of achievement measured by UPSR's grade (Table 5.1c). For the Malay Language, about two-thirds of the respondents are scoring grade A. A large number of the respondents scored grade F for English Language (n=67 or 22%). The distribution of the respondents' attainment in Mathematics is quite similar to English Language except the number of respondents achieving grade A is higher than in English Language. On the basis of these data, it seems that there are pupils who are likely to have a high attainment in UPSR, but may not necessarily be intellectually gifted (since there are only 101 pupils having Full scale IQ of 120 or greater).

Table 5.1c
The Distribution of Respondents
according to UPSR Grade
(N=303)

UPSR (subject)	Grade A	B	C	D	F*
Malay:					
Comprehension	203	58	32	20	-
Essay	199	60	12	30	2
Oral	188	82	23	10	-
English	65	49	40	82	67
Mathematics	101	60	47	76	19

*F=Fail

5.2.3 The SRBCSS

On the basis of the information shown in table 5.1d, regarding the teachers' rating using SRBCSS, it can be concluded that all distributions of teachers' ratings are near normal. Since most of the distributions are slightly negatively skewed, the teachers rated the respondents more favourably.

Table 5.1d

The Distribution of SRBCSS score
(N=303)

SRBCSS	Mean	Median	Mode	SD	Kurtosis	Skewness
Malay:						
Learning	20.9	21	22	5.2	.052	-.061
Motivation	20.2	20	18	4.2	.900	.328
Creativity	26.9	28	28	6.1	-.189	-.075
Leadership	19.4	19	16	5.9	-.596	.086
Total	92.7	92	85	19.6	.243	.081
English:						
Learning	19.4	19	16	5.9	-.596	.086
Motivation	19.4	19	18	4.7	.262	.310
Creativity	23.3	23	30	7.0	-.663	-.033
Leadership	25.9	26	30	6.7	-.519	-.114
Total	88.0	87	75	22.0	-.695	.017
Mathematics:						
Learning	17.1	19	13	7.9	-.642	-.524
Motivation	20.7	21	20	4.6	-.012	-.155
Creativity	23.2	24	30	7.5	.417	-.654
Leadership	27.1	27	30	5.9	.971	-.352
Total	88.2	88	73	18.6	.468	-.110
Class:						
Learning	20.5	21	24	4.8	.004	-.261
Motivation	20.0	19	17	4.3	-.088	.277
Creativity	22.7	24	26	7.2	.182	-.459
Leadership	26.5	27	30	5.3	.477	-.144
Total	89.7	90	83	17.5	.165	-.041

5.2.4 The SFT

The respondents rated themselves using SFT which consisted of three subtests namely Affect (Aff), Preferred Difficulty (PD) and Action (Act). With the exception of Affect, the scores are slightly negatively skewed but nearly normal (Table 5.1e).

Table 5.1e

The Distribution of SFT score
(N=303)

SFT	Mean	Median	Mode	SD	Kurtosis	Skewness
Aff	27.4	27	31	5.6	-.349	.125
PD	35.6	36	37	5.7	.792	-.518
Act	38.1	38	37	4.5	.917	-.571
Total	101.1	102	104	10.9	.099	-.257

5.2.5 The Parent's Rating

Both parents' rating (mother and father) are normally distributed (Table 5.1f). Based on the mean, median and mode, there seemed to be no difference in how mothers and fathers rated their children.

Table 5.1f

The Distribution of Parents' Rating Score (N=303)

Parent	Mean	Median	Mode	SD	Kurtosis	Skewness
Mother	68.9	70	70	8.8	.073	-.301
Father	68.2	68	72	8.2	.238	.003

5.3 The Relationship among the Measures.

5.3.1 The Importance of the Relationship among the Measures

In an exploratory study, the correlation coefficients among the variables are important indicators for two main reasons. First, the correlation coefficient provides useful information about the nature and the strength of relationships. Although the strength of the relationship is measured by the correlation coefficient, it is not to be interpreted as `cause and effect'. This is because the correlation coefficient shows how much two sets of scores are related.

The second and the more important reason to study the correlation coefficients among the variables is to enable the researcher to decide whether a more rigorous analysis such as multiple regression and discriminant analysis can be conducted.

Pearson's r, as a measure of correlation, requires scores to be normally distributed and the relationship to be linear. From the scatterplot produced by the SPSS using plot analysis, the relationships among the variables listed in the Table 5.2 were found to be linear.

The main objective of this research study is to find an alternative to individual intelligence tests to be used to identify intellectually gifted Malay children. The publication of the relationship among the measures will not only provide the basic information about further analysis that has to be done to the data but also as indicator for other researchers to conduct subsequent studies.

5.3.2 Correlation with Criterion Measure.

The correlations of other measures of giftedness (UPSR, SRBCSS, SFT and Parent's Rating Scale) with Full scale IQ of WISC-R, ranges from 0.02 to 0.58 (Table 5.2). The UPSR scores have stronger correlation with IQ than other measures (from 0.46 to 0.58). It is interesting to note that the class teachers' rating on creativity is negatively correlated with the respondents' IQ.

The inter-correlations among these measures range from low to modest. Based on this information, it can be concluded that there is an absence of a single predictor of IQ (criterion for giftedness) among the measures. It is possible that some form of combination from among the measures can be formulated as a basis from which to predict IQ by using Multiple Regression and Discriminant Function Analysis.

Table 5.2

Correlation between the Instruments/Measures

(N=303)

Instruments	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
WISC-R:																											
1. Full-IQ																											
2. Verbal-IQ	89																										
3. Perform-IQ	82	51																									
UPSR:																											
4. Malay	46	48	31																								
5. English	58	60	38	66																							
6. Maths	50	53	33	58	65																						
7. Entrance	49	50	38	53	54	55																					
Malay Teacher:																											
8. Learning	38	44	22	39	43	33	36																				
9. Motivation	26	29	14	24	29	20	16	41																			
10.Creativity	30	36	15	37	39	30	23	76	74																		
11.Leadership	36	36	26	41	45	34	27	71	60	79																	
English Teacher:																											
12.Learning	37	43	21	42	63	50	43	52	31	46	43																
13.Motivation	24	27	11	11	48	25	24	34	21	31	24	67															
14.Creativity	29	33	16	31	54	41	33	47	28	46	39	84	72														
15.Leadership	26	32	12	40	53	46	40	45	27	47	45	77	61	81													
Math. Teacher:																											
16.Learning	06	07	04	11	14	28	15	26	41	40	24	24	08	25	30												
17.Motivation	32	33	23	23	27	30	29	16	16	13	14	02	02	07	03	19											
18.Creativity	11	14	06	16	02	20	17	11	05	02	11	12	14	22	07	16	61										
19.Leadership	34	39	21	28	34	38	24	35	15	29	39	27	19	17	28	23	55	52									
Class Teacher:																											
20.Learning	31	33	24	32	35	42	40	57	38	50	46	50	27	50	50	41	13	16	35								
21.Motivation	12	14	10	18	10	26	28	33	39	36	27	18	10	24	26	44	15	09	16	62							
22.Creativity	07	09	02	08	13	06	19	27	27	22	19	01	07	03	10	29	16	48	05	46	51						
23.Leadership	31	33	22	29	32	32	34	57	44	58	58	43	28	49	47	32	13	05	42	71	57	35					
SFT:																											
24.Affect	20	19	15	10	14	24	10	19	08	16	21	11	04	12	17	06	06	04	15	30	23	13	26				
25.PD	12	14	05	07	02	10	13	18	20	24	19	12	03	15	20	21	06	04	06	25	24	17	19	13			
26.Action	02	06	03	17	07	05	16	14	12	19	13	08	00	11	13	11	01	03	01	17	18	10	18	17	44		
Parent:																											
27.Mother	31	32	19	21	33	21	14	34	28	28	27	36	32	33	31	24	18	05	23	42	39	14	10	12	14	05	
28.Father	32	32	22	22	33	23	16	37	27	31	29	43	38	40	36	24	16	02	22	38	37	10	13	11	12	03	86

Critical Value for the correlations: r=0.1123 p<0.05

r=0.1471 p<0.01

r=0.1863 p<0.001

Note: The correlation coefficients underlined are negative.

Decimal point is omitted

5.4 The Gender Differences

The ultimate aim of test/inventory developers is to produce a test/inventory that is free from gender bias. However, various cultures are still encouraging differences and levels of feminine and masculine behaviour among their members so in the responses to many tests/inventories differences between boys and girls are to be expected (Maccoby and Jacklin, 1975).

For the purposes of selection it is, therefore, essential to study the differences between boys and girls in the criterion measure. In some cases, when differences are significantly large, different norms and cut-off scores can be proposed for the two genders. Therefore, special attention is given to the WISC-R scores. Since other measures are used as predictors, in statistical analyses such as multiple regression and Discriminant Function Analysis, the mean differences between the genders are taken into consideration as the scores are converted into standard scores.

5.4.1 The WISC-R

Data in Table 5.3a indicated that gender differences are to be found in four of the Performance sub-tests (PA, BD, OA and Cod) and Performance IQ. As for the Verbal Sub-tests and Verbal IQ, although girls are found to have higher scores than boys, the differences are not significant. The Full scale IQ scores show no gender bias. Table 5.3a shows this because the better scores of girls on the verbal tests are balanced by the better score of boys on the performance tests. Therefore, a common cut-off score can be used for both boys and girls to determine intellectual giftedness.

Table 5.3a
The Differences between Boys and Girls on WISC-R

WISC-R	Boys(n=149) Mean	SD	Girls(n=154) Mean	SD	t
Subtests:					
Info	11.2	2.8	11.2	2.2	0.14
Sim	9.9	3.3	10.3	2.9	-1.07
Arit	12.6	2.8	12.4	2.6	0.63
Voc	11.0	3.6	11.6	3.4	-1.31
Com	10.9	2.9	11.2	3.1	-0.81
PC	10.9	2.7	10.8	3.1	0.36
PA	12.8	2.6	11.8	2.5	3.14**
BD	12.8	2.6	11.5	2.1	4.90***
OA	10.8	3.1	9.0	3.0	3.42***
Cod	11.8	2.6	13.1	2.8	-3.93***
IQ:					
Verbal	55.6	12.1	56.7	10.4	-0.81
Performance	58.4	8.3	56.3	8.2	2.28*
Full	109.8	13.4	108.7	12.4	0.77

*p<0.05
**p<0.01
***p<0.001

5.4.2 Other measures.

As for the other measures, with the exception of SFT and Parent's Rating, gender differences are found (Table 5.3b). In UPSR, girls are scoring/rated better than boys in Malay Language. Boys are better than girls in the Entrance Test. Teachers rated girls more favourably than boys. In all subjects, teachers rated girls as better learners than boys. As for the SFT and Parent's Rating, there are no differences between boys and girls.

Table 5.3b

The Differences between Boys and Girls on other measures

Measure	Subtest	Boys(n=149) Mean	SD	Girls(n=154) Mean	SD	t
UPSR	Malay	80.1	13.6	83.0	11.1	-2.08*
	English	59.4	20.0	60.6	18.4	-0.53
	Mathematics	66.8	19.5	69.8	17.9	-1.41
	Entrance	75.8	12.1	72.8	12.7	2.13*
SRBCSS						
Malay	Learning	20.5	5.5	21.6	4.9	-2.55*
	Motivation	19.8	4.1	20.6	4.3	-1.64
	Creativity	24.0	6.8	25.1	6.0	-1.57
	Leadership	26.0	6.2	27.9	5.8	-2.73**
	Total	89.9	20.1	95.3	18.7	-2.40*
English	Learning	18.7	6.1	20.1	5.6	-2.21*
	Motivation	19.1	4.7	19.7	4.7	-1.15
	Creativity	22.7	7.4	23.8	6.4	-1.40
	Leadership	25.6	7.2	26.8	6.2	-2.25*
	Total	88.4	23.3	90.4	20.5	-1.87*
Math	Learning	16.1	8.5	18.1	7.2	-2.19*
	Motivation	20.8	4.7	20.6	4.6	0.34
	Creativity	22.9	7.9	23.5	7.2	-1.23
	Leadership	26.7	6.4	27.5	5.4	-1.23
	Total	86.5	19.1	89.7	17.5	-1.50
Class	Learning	19.1	5.1	21.2	4.3	-2.69**
	Motivation	19.5	4.3	20.6	4.1	-2.23**
	Creativity	22.3	7.2	23.1	7.1	-1.01
	Leadership	26.1	5.8	26.9	4.6	-1.26
	Total	87.6	18.9	91.8	15.9	-2.07*
SFT	Aff	27.3	5.6	27.5	5.6	-0.21
	PD	35.5	5.5	35.6	5.8	-0.15
	Act	38.2	4.6	37.9	4.4	0.61
	Total	79.3	8.3	77.2	7.8	1.19
Parent	Mother	69.3	8.7	68.5	5.6	0.75
	Father	68.5	8.4	68.0	8.0	0.57

*p<0.05
**p<0.01

5.5 The Intellectually Gifted.

The respondents were classified as intellectually gifted if they have a full IQ score of WISC-R at least 120. Based on this criterion, 101 out of 303 (33%) respondents were categorised as intellectually gifted. This is in-line with the earlier estimation (in part one of chapter 4) that there are about 35 percent of those screened in by Raven's SPM score of 46 are having a Full scale IQ score of 120 and above. Among the 101 intellectually gifted, there are 56 boys and 45 girls. Data in Table 5.4a indicates the distribution of the intellectually gifted according to their respective schools.

Table 5.4a
The Distribution of the Intellectually Gifted
According to Schools
(N=101)

School	Gifted		Non-Gifted	
	Boys	Girls	Boys	Girls
SK Tampin*	8	9	10	8
SK Tuanku Besar*	19	7	19	12
SK Tebung	0	2	3	2
SK Dato Abdullah	5	7	9	5
SK Bt Rokan	1	2	3	3
SK Gedok	0	1	0	1
SK Sg Dua	1	2	1	3
SK Air Kuning	1	1	0	2
SK Bt Jalur	1	1	7	10
SK Jelai I	6	6	25	30
SK Sg Kelamah	1	0	4	5
SK Pasir Besar	4	2	5	10
SK Kg Ladang	1	1	1	7
SK Londah	1	1	1	2
SK Gemas	0	1	1	1
SK T A Rahman*	7	2	4	8
TOTAL	56	45	93	109

*Urban school

5.6 Classification of Respondents based on other Measures of Intellectual Giftedness.

Except for the WISC-R and UPSR, the respondents were classified or categorised as high, medium and low on the basis of percentile scores so to have almost an equal number for each category. Those who are at and above the 67^{th} percentile are classified as High. For medium, the score is between the 34^{th} to 66^{th} percentile. Those who score on or below the 33^{rd}. percentile are classified as low. The cut-off scores used to classified respondents are shown in Table 5.5.

Table 5.5

Cut-off Score for the Classification of Respondents (N=303)

Measure	Cut-off Score		
	High	Medium	Low
Teacher*:			
Malay	99-147	85-89	38-84
English	99-140	77-89	40-76
Mathematics	96-141	80-95	39-79
Entrance	98-142	83-97	43-82
SFT	107-130	96-106	64-95
PARENT:			
Mother	73-92	66-72	38-66
Father	72-93	66-71	43-65

*Based on the four sub-tests

5.7 Intellectually Gifted and non-Intellectually Gifted: A Comparison and Crosstabulation.

A good measure of giftedness is one that is able to discriminate intellectually gifted from non-intellectually gifted children. Thus, on a good measure, the mean between the intellectually gifted and non-intellectually gifted would not only differ significantly, but for both groups, the range of the scores would be exclusive. This is to enable the measure of giftedness to reduce the false positives and the false negatives.

The t-test is used to determine significant differences between the groups. On the basis of the mean and SD for both groups, a conclusion can be drawn about the exclusiveness of the two groups. The crosstabulation will provide additional information of how a the distributions of the two groups overlapped.

5.7.1 Achievement in UPSR

As a group, data in Table 5.6a indicated that on average, intellectually gifted respondents' achievement in UPSR is significantly better than the non-intellectually gifted. As the standard deviation (SD) is large, the distributions of these two groups overlapped with each other. Therefore, there are some intellectually gifted respondents having lower scores than the non-intellectually

gifted. Although t-test results for each subject indicated that the mean for the intellectually gifted is higher than the non-intellectually gifted, some of the intellectually gifted will not be selected if UPSR test scores are used for identification.

Table 5.6a
UPSR score according to Giftedness

Subject	Gifted (N=101) Mean	SD	Non-Gifted (N=202) Mean	SD	t
Malay	88.07	8.12	78.34	12.91	6.88***
English	73.26	16.43	53.44	16.95	9.69***
Mathematics	79.29	14.11	62.85	18.38	7.90***
Entrance	81.72	14.11	62.85	18.38	7.90***

***p<0.001

As the English scores are nearly normally distributed (please refer Table 5.1b) it can be seen that there is a serious overlap between the distributions for intellectually gifted with non-intellectually gifted within this category (refer to table 5.6a). There are about 34% of intellectually gifted children who have a score between 73 (mean) to 57 (one SD below the mean). For the non-intellectually gifted, there are also about 34% having a score between 53 (mean) and 70 (one SD above the mean). This means, therefore, that about 30% of children whose English scores are between 57 and 70. These children could be either intellectually gifted or non-intellectually gifted. Any attempt to define a cut-off score within one SD of the mean on the English marks would have very serious implications leading to excesses of false negatives and false positives.

As in the case of UPSR test scores, the UPSR grade for every subject also seemed not to be a good selection criterion for intellectual giftedness (Table 5.6b). Except for Malay Language, only about half of the intellectually gifted respondents achieved a grade A. There are also non-intellectually gifted achieving grade A in English and Mathematics.

Table 5.6b

The Distribution of Respondents' UPSR Grade according to giftedness (N=303)

Subject	Giftedness*	UPSR Grade A	B	C	D	F
Malay:						
Comprehension	G	87	12	1	1	-
	N	116	46	22	18	-
Essay	G	93	4	3	1	-
	N	103	56	9	31	2
Oral	G	78	13	3	7	-
	N	102	69	20	3	-
English	G	46	23	12	12	8
	N	19	26	28	170	59
Mathematics	G	54	28	10	5	4
	N	47	32	37	71	15

*G=intellectually gifted(n=101)
N=non-intellectually gifted(n=202)

5.7.2 Teacher's Rating Scale (SRBCSS)

On the whole, as data regarding t statistics indicates in table 5.7a, all teachers rated the intellectually gifted higher than non-intellectually gifted respondents. However, Mathematics and Class teachers' rating of respondents' creativity cannot be used to identify intellectually gifted as both sub-tests are found not being able to differentiate the gifted from the non-gifted.

Table 5.7a
The Teacher's Rating according to Giftedness
(Teacher=57)

Subject Teacher	Subtest	Gifted (N=101) Mean	SD	Non-Gifted (N=202) Mean	SD	t
Malay	Learning	23.2	5.0	19.8	5.0	5.57***
	Motivation	21.6	4.8	19.6	3.8	3.98***
	Creativity	27.0	6.5	23.4	6.0	4.84***
	Leadership	29.5	5.5	25.7	5.9	5.42***
	Total	101.2	19.1	88.4	18.4	5.67***
English	Learning	21.7	6.2	18.3	5.4	5.01***
	Motivation	20.7	4.7	18.8	4.6	3.32***
	Creativity	25.5	7.3	22.1	6.5	4.08***
	Leadership	27.8	6.5	24.9	6.7	3.61***
	Total	95.7	20.8	84.1	20.6	4.47***
Math	Learning	18.0	8.9	16.6	7.4	4.84***
	Motivation	22.5	4.4	19.9	4.5	4.73***
	Creativity	24.2	8.8	22.7	6.8	1.74
	Leadership	29.4	5.0	26.0	6.0	4.80***
	Total	94.1	22.8	85.2	16.9	4.02***
Class Teacher	Learning	22.1	4.4	19.7	4.8	4.17***
	Motivation	20.8	4.3	19.6	4.2	2.34*
	Creativity	22.4	8.4	22.9	6.5	0.59
	Leadership	28.5	5.2	25.5	5.0	4.90**
	Total	93.8	16.2	87.7	17.9	2.88**

*p<0.05
**p<0.01
***p<0.001

As in the case of UPSR, a crosstabulation between giftedness and teachers' rating, as in the Table 5.7b, indicates that there are some intellectually gifted rated low by teachers and there are also some who are not intellectually gifted but rated high by the teachers.

Table 5.7b

A Crosstabulation between intellectual giftedness and teacher's rating

Subject Teacher	Giftedness*	Teacher's Rating High N(%)	Medium N(%)	Low N(%)
Malay	G	54(54)	26(26)	21(21)
	N	58(29)	67(33)	77(38)
English	G	62(62)	14(14)	25(25)
	N	82(41)	43(21)	77(38)
Mathematics	G	48(48)	33(33)	20(20)
	N	56(28)	69(34)	77(38)
Class	G	41(41)	35(35)	25(25)
	N	49(24)	71(35)	82(41)

*G=intellectually gifted (n=101)
N=non-intellectually gifted (n=202)

5.7.3 Respondent Self's Rating (SFT)

It is interesting to note from the information in table 5.8a that two of the SFT sub-tests namely Preferred Difficulty (PD) and Action (Act), are not able to differentiate intellectually gifted respondents. However, the sub-test assessing the feeling of the respondents about failure, that is Affect (Aff), indicated that the intellectually gifted respondents are more tolerant of a failure experience than the non-intellectually gifted. However, the distributions of scores between the gifted and the non-gifted for Affect are overlapped.

Table 5.8a

Respondents' Self Rating
(N=303)

SFT	Gifted (N=101) Mean	SD	Non-Gifted (N=202) Mean	SD	t
Affect	28.47	5.92	26.88	5.33	2.35*
PD	36.37	5.39	35.21	5.79	1.68
Action	38.40	4.42	37.89	4.56	0.92
Total Score	80.51	7.85	76.39	7.78	4.34**

*P<0.05
**p<0.01

A crosstabulation between the respondents based on the total score of SFT and the giftedness indicates that about 40 percent of the intellectually gifted and 30 percent of those who are not intellectually gifted rated themselves positively (Table 5.8b).

Table 5.8b

A Crosstabulation between Giftedness and the SFT (N=303)

Giftedness	SFT		
	High N(%)	Medium N(%)	Low N(%)
G	43(43)	35(35)	23(23)
N	59(29)	68(34)	75(37)

*G=intellectually gifted (n=101)
N=non-intellectually gifted (n=202)

5.7.4 The Parent's Rating

The intellectually gifted respondents were rated higher by their parents (Table 5.9a). There is some overlapping of rating scores, in which, some of the intellectually gifted respondents were rated lower than expected.

Table 5.9a
Intellectual Giftedness and Parent's Rating

Parent	Gifted (N=101) Mean	SD	Non-Gifted (N=202) Mean	SD	t
Mother	72.3	7.6	67.2	8.9	4.96***
Father	71.5	7.2	66.6	8.2	5.10***

***P<0.001

A crosstabulation of the respondents according to their parents' rating and whether they were gifted or non-gifted confirmed that only about half of the intellectually gifted children are rated highly by their parents (Table 5.9b).

Table 5.9b
A Crosstabulation of Respondents according to Parent's Rating and giftedness

Parent	Giftedness*	Parent's Rating High N(%)	Medium N(%)	Low N(%)
Mother	G	47(47)	33(33)	21(21)
	N	54(27)	54(27)	94(46)
Father	G	47(47)	35(35)	19(19)
	N	51(25)	66(33)	85(42)

*G=intellectually gifted (n=101)
N=non-intellectually gifted (n=202)

5.8 Summary.

Scores generated by the measures, except for the Malay Language scale of the UPSR, are distributed normally. The relationships among the measures are also linear. Thus, data quantified by these measures can be analysed by statistical analysis that require the distribution to be normal and the relationships among the measures to be linear.

Although, on the average, the intellectually gifted respondents have higher scores than the non-intellectually gifted, the distributions of scores are over-lapping with each other. Thus, the mean for each measures is not to be proposed as a cut-off score. Furthermore, the correlation coefficients among the measures with IQ is not large which therefore indicates the absence of single effective predictor among the measures.

At this stage, there is potential for each measure to be used with other measures to identify intellectually gifted Malay children in Malaysia. In order to propose a combination of measures to be administered, further assessment such as the effectiveness, the efficiency and the predictive value of every measure has to be examined. The effectiveness and the efficiency of each measure used separately to identify intellectually gifted Malay children are presented in chapter 6. A proposal regarding a combination of measures likely to identify most intellectually gifted Malay children is offered in chapter 7.

CHAPTER VI

THE EFFECTIVENESS OF GRADES AND CUT-OFF SCORES FOR SELECTING 'BRIGHT' MALAY CHILDREN

6.1 Introduction.

Among educators, the conventional procedure for dealing with test scores is determining cut-off points and assigning grades so that the pupils can be categorised. The reduction of the scale of measurement to ordinal or nominal distorts much useful information. However, there is a widespread desire among especially policy makers to assign grades and to determine cut-off scores for any test. It is therefore essential to evaluate the effectiveness and the efficiency of this procedure in identifying intellectually gifted Malay children.

The main focus of this chapter is on the effectiveness and the efficiency of UPSR. This is because UPSR is currently used by the ministry as the sole criterion for selecting students for residential school in Malaysia. The only justification to use UPSR found in this study is the correlation of UPSR with Full IQ WISC-R which is found to be the highest of all measures used, that is from 0.46 to 0.58 (see table 5.2 p147). However, a conclusion regarding the effectiveness of UPSR as the sole criterion by which to select `bright children' has to be assessed.

There are many research findings indicating that achievement during childhood is not a good predictor of later academic achievement when compared with IQ scores. In Britain, it has been found through longitudinal studies that standardised tests known as the 11+ Examination administered during primary schooling resulted in wrongly placing many children in secondary schools (Vernon, 1970; Kelly, 1990). Therefore, for predictive purposes, an achievement test has to be supplemented by other reliable measures of intelligence.

It is pertinent to determine the effectiveness and the efficiency of UPSR and the other measures of giftedness before a comprehensive proposal can be forwarded to identify intellectually gifted Malay children. The effectiveness considers the number of intellectually gifted children overlooked by UPSR and other measures. The efficiency, on the other hand, considers the number of children nominated by the UPSR and other measures but who failed to be identified as intellectually gifted. The computation of these indices is illustrated in section 1.5.4 of chapter one (see page30).

6.1 The Assessment of UPSR.

The residential schools in Malaysia are built to give an appropriate education for `bright' children, especially Malays. Since the inception of residential schools in Malaysia, the candidates are selected on the basis of a public achievement test administered by the Ministry of Education. The Standard Five Assessment Test was used until 1982, and has been replaced by UPSR (Primary School Achievement Test) which is administered during standard six.

6.1.1 Policy and Procedure of Selecting Residential School Students.

Every year, immediately after the announcement of the UPSR results, the Ministry sends a circular and application forms through the respective schools inviting those children having at least 3 A's and 2 B's to apply for a place in the residential schools.

For the last three years, the number of children having five grades A exceeded the places in the residential schools (Sulaiman et. al., 1990) and in 1988 the Ministry introduced an Entrance Test for Residential Schools (hereafter referred as the Entrance Test) during UPSR. According to the Ministry Officials (interviewed during data collection) the selection of the candidates from among children having 5 grade A's is

on the basis of the Entrance Test score and the teacher's recommendation.

Thus, the Entrance Test scores become the final criterion for the selection of the candidates. The cut-off score for selection remained confidential and is assumed to vary from year to year.

6.1.2 The Effectiveness and the Efficiency of UPSR

In this study, the criterion for intellectually gifted is a Full scale IQ score of at least 120 on the WISC-R. One hundred and one children have been identified as intellectually gifted in the Tampin District. The 1991 UPSR results for Tampin District, shown in the Table 6.1, indicate that there are 350 candidates who could be selected if the original policy of only requiring a minimum of three grade A's and two grade B's is implemented. Among them, only 154 children are selected from the respondents of this study. However, if the selection is on the basis of five grade A's, then only 65 children would be eligible to apply.

Table 6.1

UPSR Results in Tampin District 1991

Result	Number of candidates Scoring UPSR	Number of candidates Scoring who were Screened by Raven's SPM (Respondent)
5 A's	65	48
4 A's & B	98	71
3 A's & 2 B's	187	35
Total	350	154

A crosstabulation of these children with their IQ scores is shown in Table 6.2. On the basis of the intelligence test scores, only 46 (21+20+5) out of 350 (13.1 percent) of pupils scored 5A's, 4A's and 3A's on UPSR were eligible to apply for a place were identified as intellectually gifted. On the basis of UPSR achievement, 55 percent (n=55) of intellectually gifted children are not eligible to apply for a place in the residential schools.

Table 6.2

The Distribution of the UPSR Composite Grade according to Giftedness

Screen by Raven	N	Number of Candidates Scoring UPSR 5A's (n=65)	4A's (n=98)	3A's (n=187)	NE*
G**	101	21	20	5	55
NG***	202	27	51	30	94
Total	303	48	71	35	149

*NE - not eligible
**G - Intellectually Gifted
***NG - non-intellectually gifted

Since Raven's SPM score of 46 screened all intellectually gifted (part one of chapter 4), data in Table 6.2 indicated that there are about 67 percent of those having 5 grade As, nearly 80 percent of those having 4 grade As and 93 percent of those having 3 grade As are are not intellectually gifted. Only about 13 percent (46 out of 350) of those who are eligible for applying for a place in the residential schools (having at least 3 grade As) are intellectually gifted.

Inferred from the above information, the effectiveness and the efficiency of the UPSR against Full scale IQ score on the WISC-R are calculated and shown in Table 6.3. As expected, the minimum qualification, that is 3 grade As and two grade Bs, has the highest effectiveness and lowest efficiency. On contrary, the maximum qualification of UPSR (5 grades A) has the lowest effectiveness and highest efficiency.

Table 6.3

The Effectiveness and The Efficiency of UPSR Composite Grade

UPSR Min.Grade	N	Gifted (101)	Effectiveness (%)	Efficiency (%)
3A & 2B	350	46	45.5	13.1
4A & B	163	41	40.6	25.2
5A	65	21	20.8	32.3

On the basis of the effectiveness and efficiency of the UPSR qualification, substantial numbers of intellectually gifted children are being deprived of being selected. If the selection is on the basis of minimum 3 grades A's and 2 grades B's, about 45 percent of intellectually gifted are to be short-listed. As this qualification has an efficiency of 13 percent, only one out of eight children are intellectually gifted. The imposition of 5 grade A's is depriving about 80 percent of the intellectually gifted from being selected as

it is only around 21 percent effective. But, it (5 grade A's) is a cost efficient screening measure as one out of three children are intellectually gifted (i.e 32.3% efficiency).

Recently, those with 5 grade A's are being short-listed. As the number of children having 5 grades A exceeded the places available in the residential schools, the candidates are selected on the basis of their Entrance test score. A cross tabulation of these scores with the UPSR result from among those children identified as intellectually gifted is shown in Table 6.4. As anticipated, any cut-off score of the Entrance test will deprive some intellectually gifted a place in the residential schools. Information in Table 6.4 indicates that if the cut-off score is 80 then all those intellectually gifted children having 5 A's are to be selected. However, if the cut-off score for the Entrance test is 90, then three (14.3 percent) intellectually gifted pupils are not selected.

Table 6.4

The Effect of Entrance Score on the Selection of Intellectually Gifted Candidates

Entrance Test Cut-off score	Intellectually Gifted with Minimum UPSR Qualification		
	5 A's (n=21)	4 A's & B (n=41)	3 A's & 2 B's (n=46)
90	18	32	33
80	21	37	42
70	21	40	45

6.1.3 The Head Teacher Appraisal.

Without any guideline provided by the authority, the Head Teacher is asked to appraise the candidates. Interviews with the 16 Head Teachers of the sampled schools in which this study was conducted revealed that most of the appraisals were prepared by the class teachers. Only three Heads had written their appraisals after consulting the class teachers. The main reason given by the Heads for entrusting the task to the class teachers is because the Head Teachers believed that the class teachers have access to the children's achievement records and that they are also responsible for the student's welfare.

Bearing in mind that the appraisals are written after the announcement of UPSR, the merit of the assessment forwarded by the teachers are questionable. Research findings in the area of teacher's expectation indicated that teacher appraisals are influenced by the student's achievement (Brophy and Good, 1970).

6.2 The Effectiveness and The Efficiency of other non-cognitive Measures.

For the purpose of comparison, assuming that 303 respondents are selected randomly from the population, then, there are 30 intellectually gifted among the respondents [10 percent of the population are defined as gifted (see section 1.5.1 of chapter 1)]. The effectiveness for the 33^{rd} percentile as a cut-off score on any measure is 67 percent and the efficiency is about 10 percent (Table 6.5). The effectiveness and the efficiency for the 67^{th} percentile as a cut-off score is 67 percent and about 10 percent respectively. In this study, the respondents were selected based on their Raven's SPM score. Therefore, a comparison can be made to determine whether the measures used in this study (SRBCSS, SFT and Parent Rating Scale) have substantial improvement in terms of effectiveness and efficiency.

Table 6.5
The Effectiveness of Measure in Identifying Intellectually Gifted selected Randomly

Cut-off Score (percentile)	Identified		Not Identified		Effec* (%)	Effi** (%)
	G	NG	G	NG		
67	10	91	20	182	33	10
33	20	182	10	91	67	10

*Effec=effectiveness
**Effi=efficiency

6.2.1 SRBCSS

Teachers have been alleged to be poor identifiers of gifted children (Pegnato and Birch, 1959; Gear, 1975). Therefore, the Teacher's Rating Scale has been developed as an instrument to increase teachers' effectiveness in the identification of gifted children.

In this study, a teacher rating scale known SRBCSS developed by Renzulli and Smith in 1978, was administered to four teachers (Malay Language, English Language, Mathematics and Class Teacher) to rate each respondent. The cut-off scores (see Table 5.5 p153 for detail) used to compute the effectiveness and the efficiency are the 67^{th} percentile (top one-third of the respondents) and 34^{th} percentile (top two-thirds of the respondents).

The effectiveness and the efficiency of teacher rating increased substantially after the respondents were screened by the Raven's SPM. Data presented in Table 6.6 indicates that the efficiency of teacher rating increased from 10 percent (for random selection as in table 6.5) to more than 33 percent. As for the effectiveness, there is at least an increment of 10 points.

Table 6.6
The Effectiveness of Teacher Rating using SRBCSS for respondents screened by Raven's SPM

Teacher	Cut-off Score*	Giftedness IG (n=101)	Giftedness NG (n=202)	Effec**	Effi***
Malay	67	54	58	54	48
	33	80	125	80	39
English	67	62	82	62	43
	33	76	125	76	33
Maths	67	48	56	48	46
	33	81	125	81	39
Class Teacher	67	41	64	41	39
	33	76	127	76	37

(IG=Intellectually Gifted and NG=non-intellectually Gifted)
*in Percentile
**Effec=effectiveness
***Effi=efficiency

Based on the information in Table 6.6, there were only about 50 percent of the intellectually gifted respondents among the top one-third of those rated highly by teachers using SRBCSS. Although by reducing the cut-off score to the 33rd percentile (two-thirds of the respondents) the effectiveness of teacher's rating increases, to nearly 80 percent but the efficiency decreases to about 30 percent.

Subject teachers' (teacher teaching the respondent Malay Language, English and Mathematics) ratings are found to be more effective and efficient than that of the Class Teachers. At the cut-off score of the 67th percentile, the effectiveness of their ratings ranges from 48 to 62 percent as compared to only 41 percent for Class Teachers.

If the cut-off score for teacher rating is the 67^{th} percentile, then teachers teaching English are the most effective and efficient identifiers of the intellectually gifted. However, if the cut-off score is at the 33^{rd} percentile, then, teachers teaching Mathematics are the most effective and efficient. This finding is contrary to the belief and practice among school Heads that the Class Teacher is the best teacher to be consulted or asked to appraise the children.

6.2.2 The SFT

As in SRBCSS, a cut-off score of the 67^{th} and the 34^{th} percentile or those who are, in chapter 5, used to classify respondents as high and medium are used to compute the effectiveness and efficiency of SFT in identifying intellectually gifted Malay children after being screened by Raven's SPM. As in the case of teacher rating, the effectiveness and the efficiency of the SFT are also increased compared to the ramdomly selected respondents.

Data in Table 6.7 indicates that from among those who are classified as high (one-third of the respondents), about 43 percent were intellectually gifted. By reducing the cut-off score to the 33^{rd} percentile, there are about 78 percent of intellectually gifted among the top two-thirds of SFT.

Table 6.7

The Effectiveness and the Efficiency of SFT using respondents screened by Raven's SPM

Cut-off Score*	Giftedness IG (n=101)	NG (n=202)	Effec**	Effi***
67	43	59	43	42
34	78	127	78	32

(IG=Intellectually Gifted and NG=non-intellectually Gifted)

*in Percentile
**Effec=effectiveness
***Effi=efficiency

6.2.3 Parent's Rating Scale.

Through their rating, parents are equally effective and efficient identifiers of intellectually, gifted Malay children if they were screened by the Raven's SPM. Bearing in mind that the parents in this study were being interviewed by the research assistants at their residences, the effectiveness and the efficiency of parent's ratings do not justify the cost of administration.

Table 6.8

The Effectiveness and the Efficiency of Parent's Rating

Parent	Cut-off Score*	Giftedness IG (n=101)	Giftedness NG (n=202)	Effec**	Effi***
Mother	67	47	54	47	47
	34	80	108	80	43
Father	76	47	51	47	48
	34	82	117	82	43

(IG=Intellectually Gifted and NG=non-intellectually Gifted)

*in Percentile
**Effec=effectiveness
***Effi=efficiency

6.3 Summary

On the basis of effectiveness and efficiency, the conventional procedure of assigning grades and determining the cut-off scores for each measure contains many false positives and false negatives. Therefore, the conventional procedure is not only found to be not effective but expensive. The proposal of identification on the basis of this procedure will be lacking in terms of accountability in the long run. Only one in every five of children having five grade As in UPSR is intellectually gifted. As for the other measures (SRBCSS, SFT and Parent Ratings Scale), the cut-off score that has about 70 percent effectiveness is at 34^{th} percentile. Since two-thirds of the respondents are being referred, this is not economical.

In addition to the above argument, in the case of SRBCSS, a substantial amount of teachers' time is to be taken when they are asked to rate each respondents as SRBCSS contains four subtests with 38 items. The scoring of SRBCSS is as massive as UPSR. Therefore, the Ministry has to anticipate the intense opposition from teachers' unions.

Even though, the SFT has been found to be the least effective and efficient measure/instrument to identify the intellectually gifted, considering the time and the cost taken to administer SFT is less than SRBCSS, this data indicated that SFT has certain advantages over the SRBCSS and UPSR grades.

As with SRBCSS and SFT, the Parent's Rating scale is also found not to be an effective and efficient identifier of intellectually gifted Malay children. Since most of the parents live in the remote rural areas and are illiterate, they have to be interviewed individually. Therefore, the cost of administration will be higher and this method is equally non-feasible.

Considering that the cost of administering these instruments (UPSR, SRBCSS, SFT and Parent's Rating Scale) is high and their effectiveness of identifying intellectually gifted children using conventional procedure (assigning grades and determining cut-off score for classification) is not convincing, other procedures such as using standard score has to evaluated. Multiple Regression and the Discriminant Function analyses which are frequently used in evaluating measures/instruments for personnel selection (Issac and Michael, 1982) are presented in chapter 7.

CHAPTER VII

IDENTIFYING THE EFFECTIVENESS AND THE EFFICIENCY OF PREDICTORS FROM AMONG THE SUBTESTS OF MEASURES OF GIFTEDNESS

7.0 The Objectives.

In chapter 6, it has been found that the conventional procedure (assigning a grade and classifying the total scores) of dealing with test scores of various measures of giftedness has resulted in a lack of effectiveness and efficiency. Effort has to be taken to select the measure of giftedness that can reliably predict intellectual giftedness. For this purpose, the use of standard or composite scores for each subtest or measure has been proposed by measurement experts (Mehrens and Lehmanns, 1984). This procedure requires technology such as computers and technical expertise from psychometricians.

The main objective of this chapter is to select the measure and its subtests that can be used to identify intellectually gifted Malay children after being screened by a group intelligence test (in this particular study, Raven's SPM). In addition to satisfactory effectiveness and efficiency, the proposed measure to identify intellectual giftedness has to be substantiated with data regarding its

long-term predictability of giftedness. This will be essential because any proposal has to satisfy accountability criteria since the education of bright children is an expensive operation requiring considerable financial investment.

7.1 Multiple Regression Analysis and Discriminant Function Analysis.

Two statistical techniques namely, multiple regression and discriminant function analysis, have been conducted using SPSS to determine whether standard or composite scores (sometimes also known as z or T scores) can effectively identify intellectually gifted Malay children.

The intellectually gifted children for this particular study are those who have a Full scale IQ on the WISC-R of 120 and above. For the purpose of computer analysis, the intellectually gifted respondents were coded as `1' and the non-intellectually gifted are coded as `0'. Intellectual giftedness was the dependent variable for the multiple regression and discriminant function analyses.

7.1.1 Multiple Regression

Multiple regression techniques have been widely used in the selection of personnel. This technique has been particularly effective in deciding which of several measures

should be included in a test battery for the selection of personnel. In this study, the multiple regression analysis was carried out to predict intellectual giftedness from scores earned in a weighted linear combination of predictor variables (subtests of WISC-R, UPSR, SRBCSS, SFT and Parent's Rating).

In the SPSS software, there are three procedures of multiple regression analysis namely forward, backward and stepwise. For the initial analysis, that is, to determine predictors of giftedness, a stepwise procedure is more appropriate (Hocking, 1976). A stepwise procedure, is a combination of forward and backward procedure, considering all predictor variables before formulating the prediction equation. Unlike the backward and forward procedures, the stepwise procedure will remove a non-contributing predictor variable that has already been placed in the regression equation. The variables that are the predictors of giftedness are then analysed using discriminant function analysis to determine how effective they are in classifying the respondents.

After the predictors of giftedness and their effectiveness in classifying the respondent were determined, a forced entry multiple regression was carried out. This procedure entered all designated variables together. Unlike the stepwise procedure in which giftedness was the dependent variable, the dependent variable for the later procedure was

Full scale IQ score on WISC-R. Based upon the regression equation from this procedure, a cut-off score was determined for use in identifying intellectually gifted children.

7.1.2 Discriminant Function analysis.

The discriminant function analysis proposed by the eminent British Statistician, R. A. Fisher in 1936, is a widely used procedure to assist researchers in a variety of discrimination and classification problems. The aim of discriminant analysis is to reduce a large set of multiple and correlated measurements on a set of persons or objects to a single linear composite score with values that maximally differentiate between members of the two groups.

The purposes of discriminant analysis in this study are to:

a. develop a set of linear composite scores for intellectually gifted children that exhibit the property of maximising the separation between the group mean relative to the variation within groups;

b. determine whether the intellectually gifted are significantly different with respect to their mean in the original variables of UPSR, SRBCSS, Parent Ratings, SFT and subtests of the WISC-R, when these variables are jointly considered; and

c. predict on the basis of his or her scores on the above measures whether he or she can be categorised as intellectually gifted or otherwise.

The SPSS can also perform the discriminant function analysis in a stepwise manner that is by adding variables one by one until they no longer add significantly to the discrimination power. The method used for this purpose is known as WILKS. The Wilks' Lambda for each variable is used to determine whether addition of the variable reflects the ability of that variable to discriminate between the intellectually gifted and the non-intellectually gifted. Therefore, the stepwise method provided a clear indication of the extent to which particular variables contribute to the discriminant process. This method will, to some extent, also be able to validate the predictor(s) variables produced by a stepwise procedure of multiple regression.

After the variables or subtests have been identified, the direct method of discriminant function analysis was used to determine the effectiveness of all the variables(subtests) in classifying intellectual giftedness. The direct method is similar to the forced entry procedure of multiple regression.

7.2 Predictors of Giftedness and their Effectiveness.

7.2.1 Subtests of WISC-R

The Full scale WISC-R IQ score used as the criterion for intellectual giftedness is derived from 10 subtests of the WISC-R. Using multiple regression, it is possible to select the predictor/s of Full scale IQ score among the 10 subtests. The administration of a full WISC-R takes about one hour for each child. A number of researchers have attempted to develop WISC-R short forms for the process of identifying gifted children. General findings in this area have consistently shown that the vocabulary (Voc) and Block Design (BD)subtests have been the most valuable in predicting WISC-R Full scale IQ (Dirks, Wessel, Quarforth and Quenon, 1980; Elman, Blixt and Sawicki, 1981, Lustberg, Motta and Naccari, 1990). Therefore, based upon the data from a few subtests of the WISC-R, one can decide whether to continue full administration of WISC-R.

The Multiple Regression of the subtests of the WISC-R has resulted in only one subtest, that is Vocabulary (Voc), not being a significant predictor of giftedness (Table 7.1a). The Similarities (Sim) subtest has been found to be the best single predictor of intellectual giftedness. On the basis of its R^2, 31 percent of variance in the Full scale IQ score can be predicted using the Similarities subtest score. Sim together with three other subtests (OA, Info and Com) are

accountable for 51 percent of intellectual giftedness variance. All nine subtests that are found to be significant predictors of intellectual giftedness shared only 60 percent of the variance of intellectual giftedness, an additional 10 percent to the first four subtests (i.e. Sim, OA, Info and Com).

Table 7.1a
Predictors of Intellectual Giftedness
among subtests of WISC-R

Step	Var	R	R^2	Adj.R^2	B	Beta	T	Sig.T
1	Sim	.56	.31	.31	.034	.22	5.03	.0000
2	OA	.64	.41	.41	.029	.19	4.59	.0000
3	Info	.70	.49	.48	.029	.15	3.43	.0007
4	Com	.72	.52	.51	.023	.15	3.37	.0009
5	Arit	.74	.54	.54	.025	.15	3.51	.0005
6	Cod	.75	.57	.56	.025	.15	3.71	.0002
7	BD	.76	.58	.57	.025	.13	3.24	.0013
8	PC	.77	.60	.58	.019	.12	2.98	.0032
9	PA	.78	.60	.60	.021	.12	2.97	.0032

Note: Voc was not included in the equation

Theoretically, all nine significant subtests are supposed to share 100 percent variance of intellectual giftedness (Full scale IQ score). This is to be achieved if the correlations between the criterion (Full scale IQ score) and predictors (subtests) are high (not less than 0.7) and intercorrelations among the predictors are low (less than 0.2). However, the correlations between the subtests of WISC-R with the Full scale IQ score and the intercorrelations among the subtests ranges from moderate to high (please refer to table 3.4d for details).

Using a WILKS (stepwise) method for discriminant function analysis for the ten subtests of WISC-R, a similar pattern of predictors of giftedness among the subtests is produced (Table 7.1b). However, the discriminant function analysis found that Voc is a significant predictor of giftedness. This finding suggests that the multiple regression analysis is more conservative than discriminant function analysis.

Table 7.1b

Discriminant Analysis for subtests of WISC-R
(N=303)

Step	Variable	Wilks' Lambda	Sig
1	Sim	.69	.0000
2	OA	.59	.0000
3	Info	.51	.0000
4	Com	.48	.0000
5	Arit	.45	.0000
6	Cod	.43	.0000
7	BD	.42	.0000
8	PC	.40	.0000
9	PA	.39	.0000
10	Voc	.39	.0000

When all subtests of the WISC-R are used in a predictive statistical formula, group membership in either the intellectually gifted or non-intellectually gifted was predicted well above chance levels. The results of a Fischer's Linear discrimination function revealed that intellectually gifted and non-intellectually gifted were correctly classified with a 93.07% {(181+101)/303} accuracy. All 101 intellectually gifted were correctly classified. However, 21 of the non-intellectually gifted are classified as gifted (false positives). These results are reported in Table 7.1c.

Table 7.1c
Predictive Classification Result for Intellectually and non-intellectually Gifted
(N=303)

Fisher's Linear Discrimination Function		
Variables	Non-Intellectually Gifted	Intellectually Gifted
Info	1.3915	1.6935
Sim	.7312	1.1043
Arit	1.5249	1.7977
Voc	-.4621	-.3619
Com	.9927	1.2135
PC	1.1272	1.3491
PA	1.6924	1.9280
BD	1.9083	2.1940
OA	.7912	1.1175
Cod	1.7396	2.0136
(Constant)	-62.8374	-93.4795

Classification Results		
	Predicted Group Membership	
Group	non-gifted	Gifted
non-Gifted	181(89.6%)	21(10.4%)
Gifted	0(0%)	101(100%)

An example of how to apply these findings (Table 7.1c) that led to the false positives is demonstrated in Table 7.1d. A respondent's score (that is number 26 from SK Tampin who has a Full scale IQ of 114) is computed. Since the classification is based upon the higher score; 83.5155 is greater than 82.9853, therefore this respondent is classified as intellectually gifted although his Full IQ score is not 120.

Table 7.1d

Application of Table 7.1c

Var	(non-Intellectually gifted) Score x Coefficient=Total	(Intellectually gifted) Score x Coefficient=Total
Info	12 X 1.3915 = 16.6980	12 x 1.6935 = 20.3220
Sim	9 x .7312 = 6.5808	9 x 1.1043 = 9.9387
Arit	15 x 1.5249 = 22.8735	15 x 1.7977 = 26.9655
Voc	12 x -.4621 = -5.5452	12 x -.3619 = -4.3428
Com	12 x .9927 = 11.9124	12 x 1.2135 = 14.5620
PC	6 x 1.1272 = 6.7632	6 x 1.3491 = 8.0946
PA	13 x 1.6924 = 22.0012	13 x 1.9280 = 25.0120
BD	16 x 1.9083 = 30.5328	16 x 2.1940 = 35.0640
OA	10 x .7912 = 7.9120	10 x 1.1175 = 11.1750
Cod	15 x 1.7396 = 26.0940	15 x 2.0136 = 30.2040
(Constant)	-62.8374	-93.4795
Total	82.9874	83.5155

Data from a stepwise procedure of multiple regression analysis (see Table 7.1a) indicated that four subtests of the WISC-R (Sim, OA, Info, and Com) were found to be significant predictors of giftedness and accounted for more than half of the giftedness variance. Using these four subtests to discriminate between the intellectually gifted and the non-intellectually gifted resulted in 86.14% accuracy (Table 7.1e). Compared with classification result using all ten subtests of the WISC-R found in Table 7.1c, the number of false positives (the non-intellectually gifted classified as gifted) increased from 21 to 30. The number of the false negatives (the intellectually gifted classified as non-intellectually gifted) using these four subtests are 12(11.9%).

Table 7.1e
Predictive Classification Result for Intellectually and non-intellectually Gifted
(N=303)

Fisher's Linear Discrimination Function		
Variables	Intellectually Gifted	Non-Intellectually Gifted
Sim	.8486	1.2699
OA	1.3611	1.7887
Info	1.9225	2.3709
Com	1.0539	1.3626
(Constant)	-25.5600	-43.1885

Classification Results

	Predicted Group Membership	
Group	non-gifted	Gifted
non-Gifted	172(85.1%)	30(14.9%)
Gifted	12(11.9%)	89(88.1%)

On the basis of the above findings, it can be concluded that, the Malay version of WISC-R short form should consist of four subtests; Sim, OA, Info and Com. These results appear somewhat contrary to findings reported in the literature (please see Para 7.2.1 p185). This may account of the highly verbal nature of the western version in the Voc subtest. For Malay culture, less verbal subtests would appear on the basis of the above findings, to give the best prediction of a Full scale IQ score.

Table 7.1f
Prediction Equation of WISC-R short form
(N=303)

Subtests	B	Beta	T	Sig.T
Com	1.39	.33	10.72	.0000
OA	1.42	.34	12.64	.0000
Info	1.78	.16	11.32	.0000
Sim	1.25	.13	9.68	.0000
(constant)	47.63		25.29	.0000

R^2=.80 SE=5.86 $F_{(4,298)}$=290.35 p=.0000

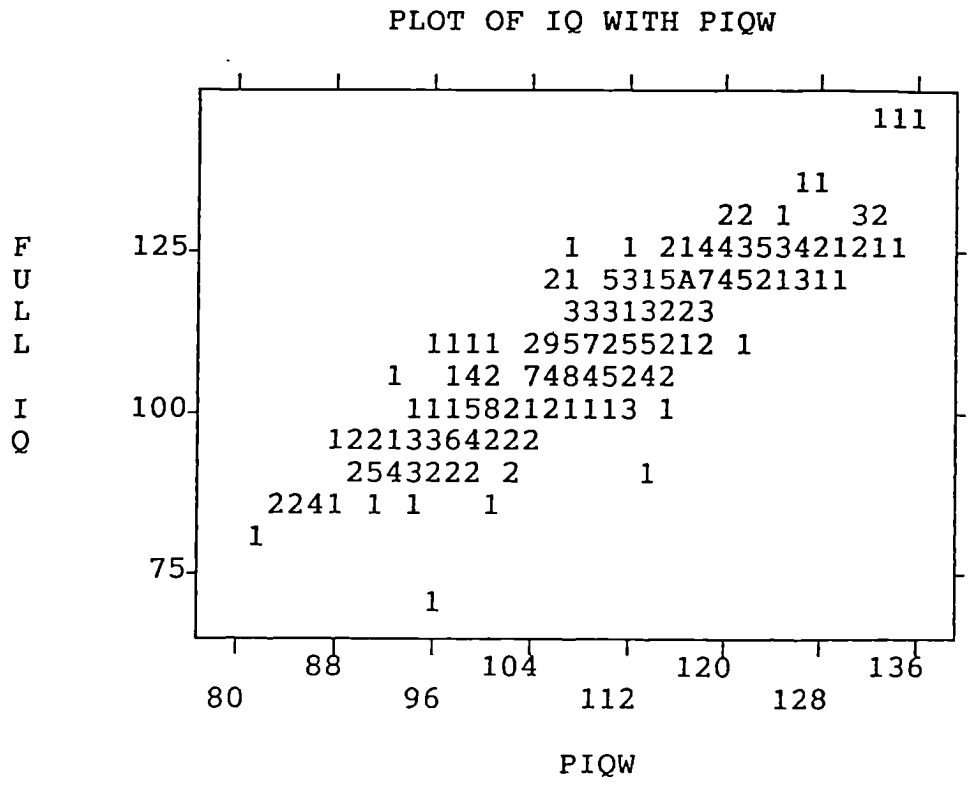
Based on the above statistics (Table 7.1f), the equation for predicting Full scale IQ score of the respondents is:

Predicted IQ (PIQW)=1.39(Com)+1.42(OA)+1.78(Info)
+1.25(sim)+47.63

The combination of these four subtests of WISC-R is significant in predicting Full scale IQ score (F=290.35 p=0.0000). The four subtests accounted for 80% of Full scale IQ score variance.

A scatterplot indicating the the distribution of predicted IQ (PIQW) and Full scale IQ score is as Graph 7.1. A Full scale IQ score of 120 is used as the criterion of giftedness. Based on the information regarding false negatives and false positives in Figure 1.2 p.31 , it can be derived from the scatterplot (Graph 7.1) that a predicted IQ (PIQW) of 105.8 should be used as the cut-off score to decide on the administration of the full WISC-R. This is to allow all those intellectually gifted (Full IQ of 120) to be identified. This cut-off score will screen out 108 (33.6%) of the respondents (true negatives).

Graph 7.1



7.2.2 The UPSR Scores.

There are four aspects appraised by the UPSR namely Malay Language, English, Mathematics and the Entrance test. Table 7.2a displays the results from the multiple regression analysis using UPSR scores as predictors for intellectual giftedness. Only two subjects are found to be significant predictors; English and the Entrance test. The best predictor Full scale IQ score among subjects tested in UPSR is English, where it accounted for about 24 percent of giftedness variance. The second predictor, the Entrance test, accounted for only an additional three percent of the variance.

Table 7.2a

Predictor of Intellectual Giftedness among the components of the UPSR

Step	Var	R	R^2	Adj.R^2	B	Beta	T	Sig.T
1	English	.49	.24	.24	.009	.37	6.17	.0000
2	Entrance	.52	.27	.27	.008	.22	3.67	.0003

A stepwise (WILKS) discriminant function analysis indicated that three subjects of the UPSR were found to be significant variables that are able to discriminate respondents into intellectually gifted and non-intellectually gifted categories. The three subjects are English, the Entrance test and Mathematics (Table 7.2b).

Table 7.2b

Discriminant Analysis for UPSR
(N=303)

Step	Variable	Wilks' Lambda	Sig
1	English	.76	.0000
2	Entrance	.73	.0000
3	Mathematics	.72	.0000

The three subjects namely English, the Entrance test and Mathematics are found to be able to correctly classify 74.94% of the respondents (Table 7.2c). Among those who are classified as intellectually gifted, 58 are found to be false positives. Among the intellectually gifted, 18 respondents are to be classified as non-intellectually gifted or false negatives. The utilisation of four subtests of WISC-R (Table 7.1f), in discriminating between the intellectually gifted and the non-intellectually gifted is found to be superior to UPSR, because the four subtests of WISC-R classified fewer false positives and false negatives.

Table 7.2c
Predictive Classification Result for Intellectually and non-intellectually Gifted
(N=303)

Fisher's Linear Discrimination Function

Variables	Non-Intellectually Gifted	Intellectually Gifted
English	.1023	.5853
Entrance	.4740	.6313
Mathematics	.5087	.5523
(constant)	-20.4050	-27.9067

Classification Results

	Predicted Group Membership	
Group	non-gifted	Gifted
non-Gifted	144(71.3%)	58(28.7%)
Gifted	18(17.8%)	83(82.2%)

Unlike other measures, UPSR scores are readily available. Therefore, three scores instead of two scores are more appropriate to predict Full scale IQ. The statistics of forced entry procedure of multiple regression, using Full scale IQ score of the WISC-R as a dependent measure, is shown in Table 7.2d.

Table 7.2d
Prediction Equation of Full scale IQ
based on three subjects of UPSR

Subjects	B	Beta	T	Sig.T
Entrance	.21	.21	3.55	.0000
English	.24	.36	5.67	.0000
Mathematics	.07	.11	1.67	.1000
(constant)	73.36		20.15	.0000

R^2=.35 SE=10.44 $F_{(4,299)}$=63.69 p=.0000

Based on the statistics shown in Table 7.2d, the equation to be used to predict the intellectually gifted (those who have a Full scale IQ score of 120 and above) using three scores of UPSR is:

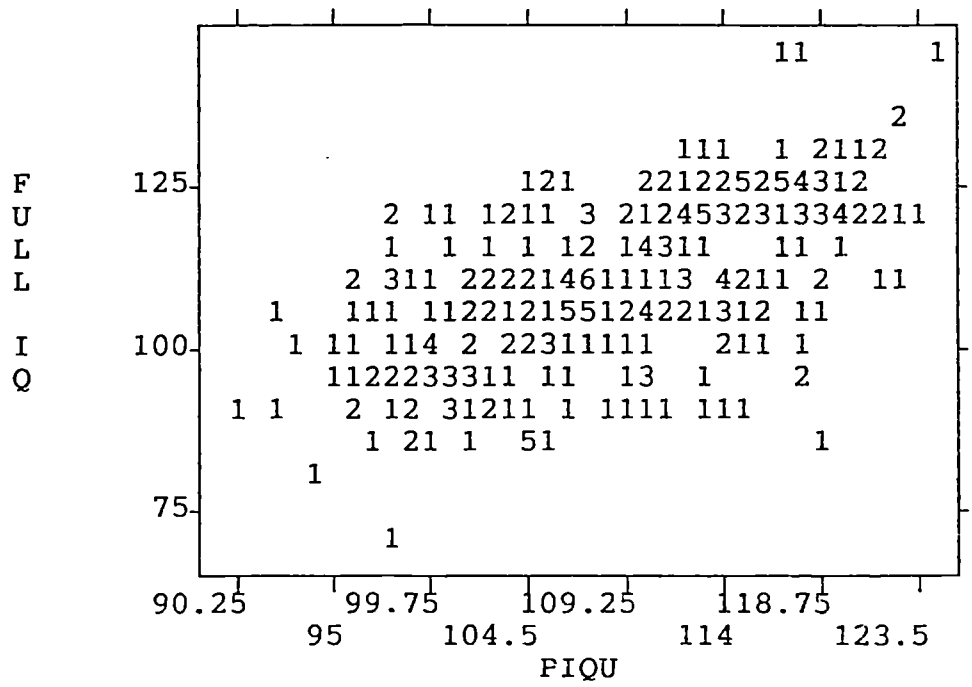
Predicted IQ(PIQU)=.21(Entrance)+.24(English)
+.07(Mathematics)+73.76.

The three subjects of UPSR shared 35% percent of the Full scale IQ score variance. The equation is significant in predicting Full scale IQ score (F=63.69 p=0.0000).

Figure 7.2 indicated the distribution of predicted IQ scores (PIQU) with the Full scale IQ of the respondents. Based upon Graph 7.2, with the proposed cut-off score, PIQU=97.6, 21(6.9%) respondents will be screened out. However, if two (2) intellectually gifted are not to be selected (cut-off score of 99.75), then the number of respondents to be screened out are 38 (12.2%). A total of 67 (22.3%) of respondents will be screened out if four (4) intellectually gifted are not to be selected (cut-off-score of 100.7).

Graph 7.2

PLOT OF IQ WITH PIQU



7.2.3 The SRBCSS

Each respondent was rated by four teachers; teachers of Malay Language (Malay), English Language (English), Mathematics (Math) and teachers responsible for the the administration of the class, or the Class Teacher (Class), using the SRBCSS. The SRBCSS has a total 38 items which consists of four subtests namely learning (8 items), motivation (9 items), creativity (10 items) and leadership (10 items).

In this particular study, data on the teachers' ratings were analysed according to the total score for the SRBCSS for each teacher and the SRBCSS subtest scores of each teacher.

a. Total Score of SRBCSS

On the basis of the total score for each teacher, there are four scores, that is, a total SRBCSS score from the teacher of Malay Language (Malay), from the Mathematics teacher (Math), from the teacher of English Language (English) and from the Class teacher (Class).

The results from a stepwise procedure of multiple regression indicated that ratings from the teacher of Malay Language (Malay), the Mathematics teacher (Math) and the teacher of English Language (English) are found to be significant predictors of intellectual giftedness. The Class teacher was excluded in the equation. The amount of variance

shared by the three categories of teachers with intellectual giftedness is small, that is around 12 percent (Table 7.3a). However, based on the stepwise procedure of the multiple regression analysis, the best predictor of giftedness is the ratings of the teacher of Malay Language (Malay) with 10 percent shared variance. The Mathematics teacher (Math) and the teacher teaching English (English) only give an additional shared variance of one percent each to teachers teaching Malay Language.

Table 7.3a

Predictors of Intellectual giftedness among the Total Score of SRBCSS

Step	Variable	R	R^2	Adj.R^2	B	Beta	T	Sig.T
1	Malay	.31	.10	.09	.005	.20	3.06	.0024
2	Math	.33	.11	.11	.003	.13	3.27	.0240
3	English	.35	.12	.12	.002	.13	2.07	.0398

The result from WIKLS procedure of discriminant analysis indicated that all four teachers total ratings of SRBCSS were signifcant and can be used to discriminate between intellectually gifted and non-intellectually gifted. The summary of Wilks' statistics is presented in Table 7.3b. The manner in which the variable is entered is similar to the multiple regression with teachers of Malay (Malay) the first to be entered.

Table 7.3b

Discriminant Analysis for Total Score of SRBCSS (N=303)

Step	Teacher	Wilks' Lambda	Sig
1	Malay	.90	.0000
2	English	.89	.0000
3	Math	.88	.0000
4	Class	.87	.0000

The four teachers total rating score using SRBCSS correctly classified 64.69% (Table 7.3c). As for the intellectually gifted, nearly 40% are to be classified as non-intellectually gifted (false negatives). Among those who are classified as intellectually gifted, more than half are non-intellectually gifted (false positives).

Table 7.3c

Predictive Classification Result for Intellectually and non-intellectually Gifted
(N=303)

Fisher's Linear Discrimination Function

Variables	Non-Intellectually Gifted	Intellectually Gifted
Malay	.9328	.1216
English	.9301	.1085
Math	.1663	.1860
Class	.1301	.1195
(Constant)	-27.8636	-30.2125

Classification Results

	Predicted Group Membership	
Group	non-gifted	Gifted
non-Gifted	134(66.3%)	68(33.7%)
Gifted	39(38.6%)	62(61.4%)

b. Teacher-subtest score of SRBCSS.

Based on the teacher-SRBCSS subtest scores, there are 16 measures of teacher's rating for every respondent (4 teachers x 4 subtests). Data shown in Table 7.3d indicated that only five measures are significant predictors of intellectual giftedness; Malay-Learning, Math-Motivation, English-Learning, Class-Creativity and Class-Leadership. The five significant predictors shared 20 percent of variance with intellectual giftedness, nearly twice the amount of variance of the total score of SRBCSS for the four teachers.

Table 7.3d

Predictors of Intellectual giftedness among the subtests of SRBCSS

Step	Variables Teacher-subtest	R	R^2	Adj.R^2	B	Beta	T	Sig.T
1	Malay-Learning	.31	.09	.09	.014	.16	2.32	.0212
2	Math-Motivation	.37	.14	.13	.023	.23	4.29	.0000
3	English-Learning	.40	.16	.15	.011	.13	2.11	.0360
4	Class-Creativity	.42	.18	.17	-.013	-.19	-3.29	.0011
5	Class-Leadership	.44	.20	.19	.015	.16	2.41	.0167

Comparing the data in Table 7.3a and 7.3d, the amount of variance shared between teacher's rating with intellectual giftedness is higher with the subtests of SRBCSS (20 percent) than the total score (12 percent). For the total score of SRBCSS, the total amount of variance shared is only 12 percent (Table 7.3a). However, with one subtest of teachers

of Malay Language, Mathematics and teachers teaching English Language, and two subtests to the Class Teachers, the amount of variance shared with intellectual giftedness increased to 20 percent (Table 7.3d). The latter procedure would demand less teacher's time in administering SRBCSS. On the contrary, the former procedure required teachers to appraise each student using all 37 items of SRBCSS. For teachers having to rate many children, there is a tendency in which `regression toward the mean' might occur in their ratings.

The stepwise procedure of multiple regression of the teacher-subtests of SRBCSS indicated that five teacher-subtests are significant predictors of intellectual giftedness. However, the WILKS' procedure of discriminant analysis identified eight (8) teacher-subtests. The summary of the result is shown in Table 7.3e.

Table 7.3e
Discriminant Analysis for the subtests of SRBCSS
(N=303)

Step	Variable	Wilks' Lambda	Sig
1	Malay-Learning	.91	.0000
2	Math-Motivation	.86	.0000
3	English-Learning	.84	.0000
4	Class-Creativity	.82	.0000
5	Class-Leadership	.80	.0000
6	Malay-Leadership	.80	.0000
7	English-Leadership	.80	.0000
8	Class-Motivation	.79	.0000

The effectiveness of 5 teacher-subtests as the result of multiple regression procedure and 8 teacher-subtests from Wilks' discriminant function analysis in classifying intellectual giftedness is shown in Table 7.3f. The difference between using eight teacher-subtests measures and five teacher-subtests is that the five teacher-subtests failed to identify only one (1) intellectually gifted child. Therefore, five teacher-subtests is more feasible than eight teacher-subtest measures.

Table 7.3f

Predicted Group Membership
by Discriminant Function Analysis
Teacher-subtest of SRBCSS

		Teacher-Subtest SRBCSS			
		8 Measures		5 Measures	
Actual	N	Predicted		Predicted	
		0	1	0	1
0	202	147 (72.8%)	55 (27.2%)	141 (69.8%)	61 (30.2%)
1	101	35 (34.7%)	66 (65.3%)	34 (33.7%)	67 (66.3%)
% correct		69.3		68.7	

Note: 0=non-intellectually gifted
1=intellectually gifted

Thus, using the Full scale IQ score as the dependent variable, the IQ prediction equation derived from a forced entry procedure of multiple regression (Table 7.3g) to be proposed to predict IQ based on the five measures of teacher-subtest score of SRBCSS is:

Predicted IQ (PIQT)=.30(Class-Leadership)
+.74(Math-Motivation)
-.39(Class-Creativity)
+.36(English-Learning)
+.61(Malay-Learning)+74.95

The above prediction equation which consists of only five subtests of SRBCSS has a standard error (SE) of 11.03. The combination of five teacher-subtests shares 28% of variance with the Full IQ score and the equation is significant in predicting IQ (F=23.08 p=0.0000).

Table 7.3g

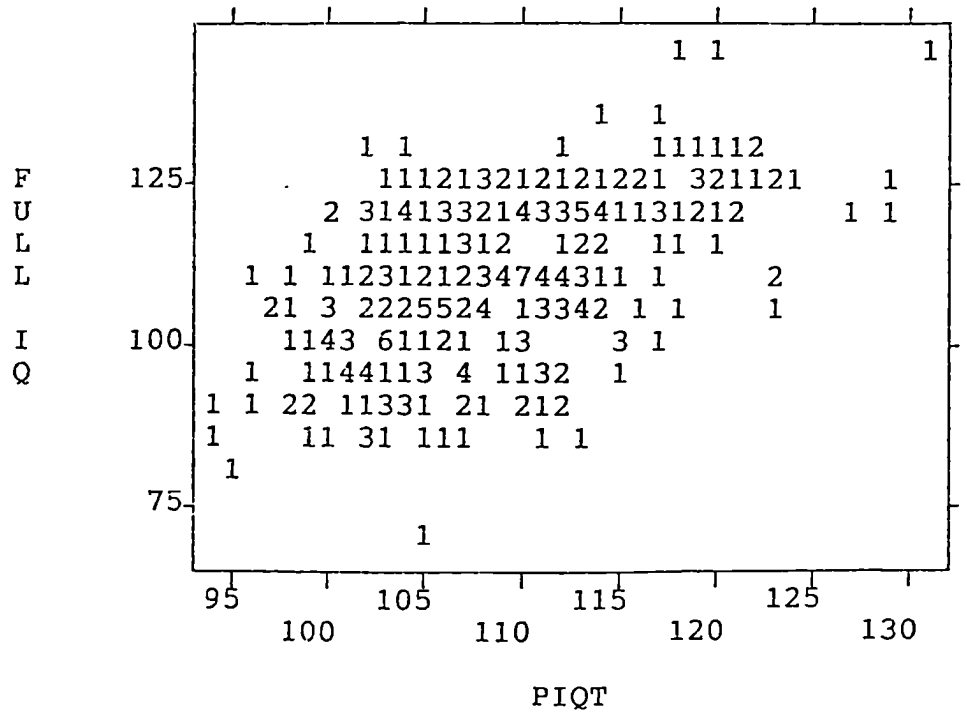
Prediction Equation for Full IQ based on Teacher-subtest of SRBCSs

Subjects	B	Beta	T	Sig.T
Class-Leadership	.30	.12	1.91	.0577
Math-Motivation	.74	.26	5.22	.0000
Class-Creativity	-.39	-.22	-3.93	.0001
English-Learning	.36	.17	2.78	.0057
Malay-learning	.61	.25	3.87	.0001
(constant)	74.95		17.98	.0000

R^2=.28 SE=10.3 $F_{5,297}$=23.08 p=.0000

The predicted IQ (PIQT) based on the above equation which consisted of five teacher-subtests of SRBCSS is computed for each respondent. A scatterplot of the predicted IQ with the Full scale IQ score on the WISC-R is displayed in Graph 7.3.

Graph 7.3
PLOT OF IQ WITH PIQT



A predicted IQ (PIQT) of 98 is proposed as a cut-off score so that all intellectually gifted children are screened in. With the proposed cut-off score, the number of respondents that will be screened out is 13(4.3%). However, if two (2) intellectually gifted are not to be selected (102 as a cut-off score), then a total of 40 (13.2%) will be screened out. A total of 57 (18.8%) respondents will be screened out if six (6) intellectually gifted are not to be selected (103 as a cut-off score).

7.2.4 The SFT.

The SFT consists of three subtests namely Affect, Preferred Difficulty and Action. The Malay version of SFT has 24 items or eight items in each subtest. The SFT has been found to be a poor predictor of intellectual giftedness, which resulted in only one subtest, that is Affect, being a significant predictor of intellectual giftedness (Table 7.4). The Affect subtest of SFT shared two percent of variance with intellectual giftedness. Thus, SFT is found to very poor predictor of intellectual giftedness.

Table 7.4
Predictors of Intellectual giftedness among the subtests of SFT

Step	Variables	R	R^2	Adj.R^2
1	Affect	.13	.02	.01

Statistics regarding discriminant function analysis of SFT (Appendix VI) indicate that the SFT is not an effective measure for identifying intellectually gifted Malay children. This is due to the low correlation between the SFT subtests and the Full scale IQ (see Table 5.2 p147)

7.2.5 Parent's Ratings

Only fathers' ratings seemed to be significant predictors of intellectual giftedness. However, the shared variance is small compared to other measures such as UPSR and SRBCSS. As data in Table 7.5 indicates, a significant predictor is rating by the father, which shares about eight percent variance with intellectual giftedness.

Table 7.5a

Predictors of Intellectual giftedness among Parent's Rating

Step	Variables	R	R^2	Adj.R^2
1	Father	.28	.08	.08

The statistics regarding the parents' rating (see Appendix VII) indicated that, parents' ratings are not an effective measure for identifying intellectually gifted Malay children.

7.3 The Summary on the effectiveness of Giftedness Measures in Classifying Intellectually Gifted

It can be concluded that the stepwise procedure of multiple regression and WILKS procedure of discriminant function analysis produced similar pattern of predictive variables for giftedness. However, a stepwise procedure of multiple regression is more conservative than WILKS' method of discriminant function analysis.

The above analysis of the data indicates that intellectually gifted Malay children can be identified after being screened by Raven's SPM either by using the formula provided by the discriminant function analysis or by a cut-off score resulting from a predicted IQ score based on multiple regression. It must be borne in mind that the main objective of any identification procedure is to avoid false negatives and to minimise false positives. Using a formula produced by discriminant function analysis, one has to anticipate that there a number of intellectually gifted being rejected (false negative). Based upon the formula given by multiple regression, the number of false negatives and false positives can be manipulated by choosing the cut-off score.

7.3.1 Discriminant Function Analysis

A summary of the above findings, based upon the discriminant function analysis, is shown in Table 7.6. The four subtests of the WISC-R are found to be the best measure to classify intellectually gifted and the least effective instrument to be used to identify intellectually gifted is the SFT. The UPSR, SRBCSS and Parent's Rating are not effective measures of giftedness as they have high numbers of both false positives and false negatives.

Table 7.6

Effectiveness of Giftedness Measure in Classifying Intellectually Gifted

Measure/subtest	Classified as Gifted	Correctly Identified Gifted(N=101)	False (+)	False (-)
WISC-R/4	129	89(88.1%)	30(25.2%)	12(11.9%)
UPSR /3	141	83(82.2%)	58(41.1%)	18(17.8%)
SRBCSS/5	128	67(66.3%)	61(47.7%)	34(33.7%)
SFT /2	146	60(59.4%)	86(58.9%)	41(59.4%)
Parent/father	136	63(63.6%)	73(53.7%)	36(36.4%)

7.3.2 The Multiple Regression Equation

Based on the information in Table 7.7, the four subtests of WISC-R are the best measure of giftedness. They screened in 195 (64.4%) respondents. In order to be cost effective in using other measures (UPSR, SRBCSS, SFT and Parent Rating scale), a higher cut-off score will be recommended.

Table 7.7

The Summary of the Effectiveness of the Cut-off score based upon Predicted IQ

Measure/ Subtests	Cut-off Score	Retained N (%)	False(-) N	Effec* (%)	Effi** (%)
WISC-R/4	105.8	195 (64.4)	0	100	51.8
UPSR/3	97.6	282 (93.1)	0	100	35.8
	99.7	265 (87.5)	2	98	37.4
	100.7	236 (77.9)	4	96	41.1
SRBCSS/5	98.0	290 (95.7)	0	100	34.8
	102.0	253 (83.5)	2	99	39.1
	103.0	246 (81.2)	6	94	38.6
SFT/2	104.0	296 (97.7)	0	100	34.1
Parent/father	102.6	287 (94.7)	0	100	35.2

*Effec=Effectiveness
**Effi=Efficiency

7.4 Multi-stage Identification of Intellectually Gifted Malay children.

It can be concluded that the best measure to identify intellectually gifted Malay children is a short form of an intelligence test. By comparison, other non-cognitive measures such as SRBCSS, SFT and Parent Rating Scale are not effective.

On the basis of the above findings (part 1 of chapter 4 and information provided by Table 7.6 and Table 7.7), there are three procedures proposed for identifying intellectually gifted Malay children in Malaysia (Figure 7.1). By assuming that there are an average of 1000 Malay children at the age of 12 in a district, the professional cost of administering Full WISC-R is MR$50.00 for a child (professional fee stated in Treasury Circular is MR$50.00 an hour) and MR$25.00 for WISC-R short form (consisting of four subtests). Then, total cost for every procedure can be calculated by assuming that there are 150 districts in Malaysia.

Figure 7.1

Proposed Multi-stage Identification Procedure
to Identify Intellectually Gifted Malay Children

Procedure 1 - No False Negative

Stages	First	Second	Final
Measure	Raven'SPM	WISC-R Short form	Full WISC-R
Referred	40%	65%	IQ=120
N (From N=1000)	400	260	100

Cost: [(MR$25x400)+(MR$25x260)]x150 = MR$2,475,000.00.

Procedure 2 - 4% False Negatives

Stages	First	Second	Third	Final
Measure	Raven's SPM SPM	PIQU (100.7 as a cut-off score (p197)	WISC-R short form	Full WISC-R
Referred	40%	78%	65%	IQ=120
N from (N=1000)	400	312	203	96

Cost: [(312x$25)+(203x$25)] x 150 = $1,931,250

Procedure 3 - 18 % False Negatives

Stages	First	Second	Third	Final
Measure	Raven's SPM SPM	Discriminant Function Analysis Formula (p194)	WISC-R short form	Full WISC-R
Referred	40%	47%	65%	IQ=120
N from (N=1000)	400	141	92	83

Cost: [(141x$25)+(92x$25)] x 150 = $873,750

CHAPTER VIII

CONCLUSION AND RECOMMENDATION

8.0 Introduction

This chapter consists of two parts; namely the summary of the findings to be highlighted from this study and the proposal regarding the establishment of a longitudinal study to validate the proposed measures in identifying intellectually gifted Malay children.

8.1 The Summary of the Findings.

1. In the literature (chapter 2), the concept of intellectually giftedness is closely associated with the concept of intelligence. Hence, IQ scores derived from the intelligence test are used as the main criterion of giftedness. Although psychologists have attempted to broaden the concept of giftedness, by adding other criteria, IQ is still crucial in the classification of intellectual giftedness (Richert, 1985; Yarborough and Johnson, 1983).

2. In the traditional approach, the IQ scores derived from either the WISC-R or Stanford Binet are used as final confirmation of intellectual giftedness. Group (mainly non-verbal) intelligence tests, achievement test, teachers' and parents' appraisals, and children's self assessments are used as referral or screening measures.

3. In the first part of chapter 3, the Malay version of commonly used measures (instruments) to identify intellectually gifted children, namely the WISC-R, SRBCSS, SFT and Parent's Rating Scale, have been found to have similar relaibility, stability and validity in assessing intellectually gifted Malay children.

4. There are many studies indicating that a Group intelligence test can effectively screen intellectually gifted children (Martinson and Lessinger, 1960; Pegnato and Birch, 1959; Rust and Lose, 1980). In this study, the Raven's SPM (a non-verbal group intelligence test) is found to be moderately correlated with WISC-R. Therefore, using a lower cut-off score of Raven's SPM in order to include all intellectually gifted, Raven's SPM can effectively screen out 60% of children. Among the 40% screened in (or referred), one in three may be intellectually gifted. Based on this finding, as presented in the first part of chapter 4, Raven's SPM is suggested for use as an initial screening measure for identifying intellectually gifted Malay children. This procedure was adopted as a basis for selecting the respondents for the study.

4.1 As for the main study, 32% of the respondents had a score of 46 or more on the Raven's SPM. Out of the 303 children then tested by the WISC-R, 101 or 33 percent had a Full scale IQ score of 120 and above (intellectually gifted).

These findings (presented in the second part of chapter 4) are in-line with the earlier prediction based on the findings presented in the first part of chapter 4. Among the 303 children having Raven's SPM score of 46 or more, 101 or 33% were found to be intellectually gifted.

5. In Malaysia, residential schools are built to provide education for 'bright' Malay children. The cost of educational programmes for these children is almost five times more than those for ordinary children. These bright children are selected on the basis of their achievement in UPSR. However, it has been found out that after five years in the residential schools, these children are not performing as expected in the public examination. Therefore, there is widespread desire especially among policy makers to scrutinise the process of selecting these 'bright children'.

5.1 The candidates for residential schools are selected on the basis of their achievement in UPSR. In Britain, it has been found that a similar test to UPSR, the 11+ Examination, has wrongly placed many secondary school children (Kelly, 1990; Vernon, 1957). In this study (as highlighted in chapter 6), there are only 33% of those children having 5 grade A's in UPSR who are intellectually gifted. The Entrance Examination test, introduced as a supplement to UPSR in 1988 to select the candidates, is found to deprive between 55 to 82 percent (see Table 6.4)

intellectually gifted the chance of getting a place in a residential school. Therefore, based on these findings, it can be concluded that for a residential placement, the current procedure of selecting the bright children on the basis of their UPSR grades, is found to be neither effective nor efficient in selecting intellectually gifted.

5.2 Although the effectiveness and the efficiency of the non-cognitive measures were increased after the respondents were screened by Raven's SPM, in general, their effectiveness and their efficieny are not convincing when the percentile is used as a cut-off score.

6. In chapter 7, using statistical analysis such as multiple regression and discriminant function analysis, 4 subtests of WISC-R, 3 test scores of UPSR, 5 teacher-subtests of SRBCSS were found to be significant predictors of giftedness.

7. Among the 10 subtests of WISC-R, four subtests (i.e. Similarities, Object Assembly, Information and Comprehension) are found to share 52% variance with the Full IQ (please refer Table 7.1a). They are, therefore, able to form a basis for establishing the Malay version of the WISC-R short form. The time taken to administer the Malay version of the WISC-R short form is about half of the full WISC-R and therefore the Malay version of the WISC-R short form can be utilised as a screening measure.

7.1 Based on a formula generated by discriminant function analysis (Table 7.1e), the Malay version of the WISC-R short form is able to correctly classify 86 % of respondents. For those classified by the formula as intellectually gifted, 25 percent are actually non-gifted (false positives). About 12% of those who are intellectually gifted will be classified as non-gifted (false negatives) by the formula.

7.2 A formula for predicting Full scale IQ scores can be computed from the Malay version of the WISC-R short form (which consisted of Sim, OA, Info and Com) using multiple regression analysis. These four subtests shared 80% of the Full scale IQ variance (Table 7.1f). A cut-off score, derived from the regression formula, that will include all intellectually gifted is found to be able to screen out 34% of respondents.

8.0 In the case of UPSR, only the Malay Language test score was not a significant predictor of intellectual giftedness. The significant predictors of giftedness are English, the Entrance test and Mathematics. These three tests shared 35% of variance with the intellectual giftedness (please refer table 7.2a to 7.2c).

8.1 The formula, derived from discriminant function analysis based on English, the Entrance test and Mathematics test scores, correctly classified 75% respondents into

intellectually gifted and non-gifted. However, 18% of the actual intellectually gifted are classified as non-gifted (false negatives). For those who are classified as intellectually gifted by the formula, about 40% are actually non-gifted (false positives).

8.2 The cut-off score, derived from the formula based on the multiple regression analysis to predict Full IQ using the three predictors (English, the Entrance test and Mathematics), that will include all intellectually gifted is found to be able to screen out about 7% of the respondents. To be an effective screening measure, a cut-off score that will exclude at least 4 (4%) of the intellectually gifted has to be advocated so that about 32.1% respondents will be screened out.

9.0 The administration of SRBCSS (that has four subtests and a total of 37 items) to all teachers teaching the respondents will be a massive and expensive operation. The findings from this study suggest that the administration of SRBCSS as follows;

Teacher	Subtest	Items
Malay	Learning	8
English	Learning	8
Mathematics	Motivation	9
Class	Leadership+ Creativity	10+10

This means that the teacher of Malay, for example, would only administer the learning subtest which containts only 8 items, a considerable reduction on the full test.

9.1 Based on the formula derived from the discriminant function analysis, the above five teacher-subtests scores correctly classify 69 percent of the respondents into intellectually gifted and non-gifted. About one-third (33.7%) of the actual intellectually gifted children are classified as non-gifted (false negatives) by this formula. Among those who are classified as intellectually gifted, nearly half are non-gifted (false positives).

9.2 The cut-off score (PIQT=98), derived from the prediction formula using multiple regression analysis of the five teacher-subtests of SRBCSS, that will include all intellectually gifted is found not to be effective. This is because the cut-off is only able to screen out about 5% of the respondents. A cut-off score (PIQT=103) that will exclude six (6) intellectually gifted is more effective as it will screen out about 20% of the respondents.

10. In-line with the findings from the previous studies, the child self appraisal (in this particular study SFT) is found to be an ineffective measure for identifying intellectually gifted Malay children as it shares only 2% variance with intellectual giftedness.

11. With lower effectiveness (sharing only 8% variance with intellectual giftedness) and a high cost of administration, the findings in this study suggest that

a parents' rating scale is not a feasible measure of identifying intellectually gifted Malay children.

12. Based on the above findings, there are three alternatives (as presented in Figure 7.1 p213) for the multi-stage procedure of identifying intellectually gifted Malay children to be proposed. The three screening measures proposed for the procedure are Raven's SPM, UPSR test scores and the Malay version of WISC-R short form which consisted of four subtests (SIM, OA, Info and Com).

8.2 Recommendation: The proposal for the establishment of longitudinal validation study.

8.2.1 Rationale of the proposed study.

The identification of intellectually gifted children must be comprehensive and continuous (Anderson, 1961). It must be comprehensive so that all intellectually gifted children are identified (free from false negatives and false positives) and continuous, that is, the identification of intellectually gifted children must consider the phenomenal change in ability with age and the problems related to it. The present study has shortcomings such as the limited scope of the study (as highlighted in section 1.9 of chapter one) and focusses only on measurable aspects of giftedness. The observation and data analysis are highly quantitative that may exclude crucial predictors of giftedness. Thus, one has to be cautious to generalise the above findings.

So, in order for the proposed identification procedure, based on the findings of this study to be comprehensive and continuous, it is crucial to replicate the above study. Therefore, there is an urgent need to establish a longitudinal study so to validate these findings. As some of the measures (especially SFT and the Parent Rating Scale) are not effective measures, a triangulation measurement strategy which incorporates more than one measure of the phenomena or constructs has to be conducted. For example, other intelligence tests such as the British Ability Scale, and the Stanford-Binet would be evaluated against the WISC-R as a criterion of giftedness. The previous findings (section 8.1) would be used as baseline data against which to make meaningful comparisons.

8.2.2 The objectives.

The aim of the study would be to determine the short-term and the long-term effects of the widely used measures of intellectual giftedness.

The objectives of this study would be to:

1. determine the consistency and the stability of the score generated by these measures,

2. establish evidence of validity especially in terms of the predictive value of the measures,

3. suggest or recommend other measures besides Raven's SPM, WISC-R, UPSR, SRBCSS and the current Parent's Rating Scale to be used to identify intellectually gifted Malay children.

8.2.3 Methodology.

There are two approaches for the proposed study namely quantitative and qualitative. In the quantitative approach, a quasi-experimental design is thought to be appropriate so that a `control group' either through classification (such as gifted and non-gifted) or through statistical analysis (such as ANACOVA or analysis of covariance) can be established. With a control group, a statement regarding `cause and effect' can be concluded.

Since a quantitative approach lacks ecological validity, a qualitative approach, especially non-obstructive observation, for this particular study is crucial as not all aspects of giftedness can be quantified and measured. An observational study will focus on the children's attitudes and behaviours toward learning, peers, teachers and parents. More conclusive findings could be drawn from this particular study.

8.2.4 The Respondents.

The children and their parents involved in the present study should be asked to participate in the longitudinal study. The children can be grouped according to their IQ (Gifted and non-gifted based on the WISC-R assessment), UPSR grades (grade A to F), the type of schools (ordinary and residential), their teachers', parents' and

their self appraisal (high, medium and low) in order to enable ex-post facto and factorial comparison.

8.2.5 Data collection

In a longitudinal study, where each respondent is asked to respond to the same measure several times, there are always two major risks namely preamble effect and practice effect. According to Cantril (1944), preamble effect happens when a test or a questionnaire induces certain attitudes of the respondent. As for the practice effects, the gains in score for the later sitting are attributed to the `test-wiseness'.

In order to reduce the above risks, it is recommended that the data are collected twice, during year three and during year five of secondary schooling. At the end of year three and year five, the children have to sit SRP and SPM (please refer Figure 1 p15).

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Appendix I

TRANSLATION PANEL

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3. HABIBAH ELIAS B.A. (Hons) M.S. Ph.D (UKM)
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4. SHARIPAH MD NOR B.A. (Hons) M.A. Ph.D (Wisconsin)
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5. MOHD NOR YASSIN Cert. of Ed. B.Ed (Teaching of Malay)(UPM)
   Former Primary School Teacher and currently is Acting
   Head of Secondary School.

The Malay Version of WISC-R

WISC-R

Nama:_____ Jantina:L/P Sekolah:_____ Drjh:____
Tarikh lahir:_____ I.D.:_____

1. INFORMATION

Tamat jika gagal menjawab 5 soalan berturutan

Soalan		Jawapan	skor(1)
	1. Anda panggil ini apa?	Ibu jari	___
	2. Berapa telinga anda?	2	___
	3. Anjing ada berapa kaki?	4	___
	4. Apa yang perlu kita buat untuk memasak air?	Panaskan/masuk dlm cerek/Pasang api/lektrik	___
8-10>5.	Berapa sen dalam seringgit?	100	___
	6. Kita panggil anak katak apa?	Budu/katak budu	___
11-13>7.	Satu minggu ada berapa hari?	7	___
	8. Bulan apa selepas bulan Mac?	April	___
	9. 'Belacan' dibuat dari apa?	Udang	___
	10. Berapa banyak barang dalam satu dozen?	12	___
14>11.	Apa nama musim bila hujan lebat dan banjir berlaku?	Tengkujuh	___
	12. Siapa menjumpai Melaka?	Parameswara	___
	13. Apa perut kita buat?	Hancur/simpan/proses	___
	14. Apa arah matahari mati/ terbenam?	Barat	___
	15. 'Leap year' ditentukan oleh bulan apa?	Februari/dua	___
	16. Siapa cipta talipon?	Bell	___
	17. Kita merdeka tahun 1957 dari siapa?	British/orang putih	___
	18. Kenapa minyak terapong atas air?	Rengan/tidak berat	___
	19. Namakan dua negeri yang menjadi jiran N. Sembilan?	Melaka/Johor/Pahang/ Selangor	___
	20. Dalam satu kilogram ada berapa gram?	1000	___
	21. Peru ibu negeri apa?	Chile	___
	22. Cawan dan piring dibuat dari apa?	Tanah liat	___
	23. Dimana sukan Olimpik mula-mula diadakan?	Athen/Greece	___
	24. Satu kaki berapa inci?	12	___
	25. Apa nama alat untuk ukur tekanan?	Barometer	___
	26. Kenapa besi berkarat?	Basah/air/oksigen	___
	27. Berapa jauh Tampin dari sini?		___
	28. Apa nama bahasa orang Mesir yang asal/mula-mula?	Heiroglyphics	___
	29. Siapa yang mengemukakan teori evolusi?	Darwin	___
	30. Boksida menghasilkan apa?	Aluninium	___
		JUMLAH:	_____/30

1

2. PICTURE COMPLETION

Tamat jika gagal 4 kali berturut-turut

Gambar		Jawapan	Skor	Gambar		Jawapan	Skor
6-7>	1. sikat	gigi	___	14. terup		diamond	___
	2. perempuan	mulut/bibir	___	15. berlari		sarung kaki	___
	3. musang	telinga	___	16. kot		butang	___
	4. tangan	kuku	___	17. lelaki		tali jam	___
8-16>	5. kucing	misai	___	18. gunting		skrew	___
	6. cermin	bayang	___	19. budak		telinga	___
	7. jam	no. 8	___	20. skrew		lobang	___
	8. gajah	kaki	___	21. lembu		kaduh	___
	9. tangga	anak	___	22. suhu		raksa/cecair	___
	10. meja/rak	pemegang	___	23. petang		bayang pokok	___
	11. talipinggang	lobang	___	24. talipon		wire	___
	12. Lelaki	hidung	___	25. muka		bulu kening	___
	13. pintu	'hinge'	___	26. payung		'spokes'	___

JUMLAH: _____/26

3. SIMILARITIES

Tamat jika gagal 3 soalan berturut-turut

Soalan	Jawapan	Skor (1@0)
1. RODA-BOLA	bulat/berputar/berpusing/seperti O	___
2. LILIN-LAMPU	cahaya/buat bayang/waktu malam/panas	___
3. BAJU-SONGKOK	pakaian/benang/beli	___
4. PIANO-GITAR	musik/tali/menyanyi	___ (2,1,0)
5. APEL-PISANG	2-buah-buahan, 1-makanan/tanaman O-baik/rasa manis/ada kulit	___
6. SAMSU-TUAK	2-memabukkan/haram, 1-minuman, O-dalam botol/rasa pahit	___
7. TIKUS-KUCING	2-binatang/mammal, 1-ada 4 kaki/bulu/ nampak dlm gelap/mencakar, O-berlari	___
8. SIKU-LUTUT	2-sambung anggota, 1-tulang/bergerak, O-kuat/kulit	___
9. TALIPON-RADIO	2-alat perhubungan/komunikasi, 1-bateri@letrik/suara@cakap, O-penting	___
10. KILOGRAM-METER	2-unit ukuran/sukatan, 1-bertahu no O-ada skala/guna math.	___
11. MARAH-GEMBIRA	2-perasaan/emosi/mood, 1-apa kita rasa	___
12. GUNTING-KUALI	2-dibuat dari besi/perkakas rumah, 1-alat, O-ada pemegang/keras/kuat	___
13. GUNUNG-TASIK	2-bentuk bumi yang semulajadi 1-pemandangan/peta/berihat, O-cantik	___
14. KEBEBASAN-KEADILAN	2-Unggul/hak/moral, 1-simbol negeri/sama rata, O-kedamaian/undang-undang	___
15. PERTAMA-TERAKHIR	2-Ekstrim/kronologi, 1-kedudukan O-nombor	___
16. 49-121	2-gandadua/punca gandadua, 1-nombor ganjil/tidak dapat bahagi dua, O-nombor	___
17. GARAM-AIR	2-bahan kimia/bahan asas hidup, 1-masak/ makanan, O-laut/rasa	___

JUMLAH: _____/30

4. PICTURE ARRANGEMENT

Tamat jika berlaku 3 kegagalan termasuk 2 percubaan

Tajuk		Kata Kunci	Had	Masa(saat)/Skor 1/2*	3	4	5	
	Scale	ABC	45					
6-7>	1. Fight	OUT	45	45				___
	2. Picnic	DOG	45					___
8-16>	3. Fire	FIRE	45	45				___
	4. Plank	WALK	45	45				___
	5. Burglar	THUG	45		16-45	11-15	1-10	___
	6. Sleeper	RUSH	45		16-45	11-15	1-10	___
	7. Artist	VAMP	45		16-45	11-15	1-10	___
	8. Lasso	CASH	45		16-45	11-15	1-10	___
	9. Boat	CHASE HCASE-2 markat sahaja	60		21-60	11-20	1-10	___
	10. Gardener	WORMS WROMS-2 markat sahaja	60		26-60	16-25	1-15	___
	11. Bench	BENCH BECHN-2 markat sahaja	60		26-60	16-25	1-15	___
	12. Rain	CLOUD COLUD-2 markat sahaja	60		26-60	16-25	1-15	___

JUMLAH/ ____/48

*2 markat selepas berjaya percubaan dan 1 markat seterusnya

5. ARITHMATICS

Tamat jika berlaku 3 kegagalan yang berturutan

Soalan		Had masa	Jawapan	Skor
	BERDASARKAN GAMBAR			
6-7>1.	Sila kira pokok dalam gambar ini?	30	12	___
2.	Sekarang ada berapa pokok?	30	4	___
3.	Berapa pokok dalam gambar ini?	30	9	___
4.	Jika kita tambah satu pokok pada setiap hujung, ada berapa pokok?	30	14	___
	BACA DENGAN KUAT			
8-10>5.	Satu buah epal dipotong separuh akan menjadi berapa bahagian?	30	2	___
6.	Siti ada 5 helai sapu tangan. Sapu tangannya hilang 1. Tinggal berapa?	30	4	___
7.	Atan ada 4 sen. Ibunya beri 2 sen. Atan ada berapa sen?	30	6	___
11-13>8.	Ali ada 8 buah guli dan dia beli lagi 6. Ali ada berapa buah guli?	30	14	___
9.	Kawan anda ada 12 komik dan dia jual 5. Ada berapa komik lagi?	30	7	___
16>10.	Jika sebungkus harganya 8 sen, berapa harga 3 bungkus coklat?	30	24	___
11.	Long, Cik dan Usu mendapat $9 bila menorih. Berapa jumlah wang mereka?	30	$27	___

12.	Abu ada 25 bungkus ais kerim dan dia jual 14 bungkus. Tinggal lagi berapa bungkus?	30	11	___
13.	Seorang pekerja dibayar gaji $4/jam Jika dia mendapat $36, berapa jam dia bekerja?	30	12	___
14.	Jika anda membeli 2 dozen pensil yang harganya 45 sen. Berapa sen wang $1 anda akan dikembalikan oleh pekedai?	45	10	___
15.	4 orang budak mendapat wang 72 sen. Jika dibahagi sama rata, seorang mendapat berapa sen?	45	18	___
	RESPONDEN BACA DENGAN JELAS			
16.	3 biji gula-gula berharga 5 sen. Berapa harga 24 biji gula-gula?	75	40	___
17.	Sidi hanya membayar $28 iaitu 2/3 dari harga basikal itu. Berapa harga sebenar sebenar basikal itu?	75	42	___
18.	Harga asal sehelai baju ialah $32 dan pekedai memberi potongan harga sebanyak 1/4. Apabila tiada siapa yang membelinya, pekedai menjualnya 1/2 harga jualan. Jika anda hendak beli baju itu, berapa ringgit anda perlu bayar?	75	12	___

JUMLAH ____/18

6. BLOCK DESIGN

Tamat jika berlaku 2 kegagalan yang berterusan

6-7>item 1
8>item 3

Item(Blok)	Skor: 1/2*					
1(4)	45					___
2(4)	45					___
3(4)	45					___
		Skor				
	Had	7	6	5	4	
4(4)	45	1-10	11-15	16-20	21-45	___
5(4)	75	1-10	11-15	16-20	21-75	___
6(4)	75	1-10	11-15	16-20	21-75	___
7(4)	75	1-10	11-15	16-20	21-75	___
8(4)	75	1-15	16-20	21-25	25-75	___
9(9)	120	1-25	26-35	36-55	56-120	___
10(9)	120	1-40	41-55	56-75	76-120	___
11(9)	120	1-40	41-55	56-80	81-120	___

JUMLAH: ____/62

*2 markat selepas percubaan pertama dan 1 markat seterusnya.

7. VOCABULARY

Tamat jika gagal menjawab 5 soalan berterusan

Perkataan		Jawapan	Skor(2,1,0)
6-7>	1.	Pisau	___
	2.	Payung	___
	3.	Jam	___
8-10>	4.	Topi	___
	5.	Basikal	___
11-13>	6.	Paku	___
	7.	Alphabet	___
16>	8.	Kaldai	___
	9.	Pencuri	___
	10.	Bersatu	___
	11.	Gagah	___
	12.	Permata	___
	13.	Judi	___
	14.	Faedah	___
	15.	Halangan	___
	16.	Jangkit	___
	17.	Sampah	___
	18.	Dongeng	___
	19.	Bahaya	___
	20.	Pendatang	___
	21.	Rangkap	___
	22.	Asing	___
	23.	Kumbang	___
	24.	Intip	___
	25.	Loteng	___
	26.	Musuh	___
	27.	Gubal	___
	28.	Paksa	___
	29.	Cedera	___
	30.	Roboh	___
	31.	Mashyur	___
	32.	Beban	___

JUMLAH:_____/64

8. OBJECT ASSEMBLY

Item	Had	Bil	Darab	Maxima	Bonus 9	8	7	6	5	Skor
1.Girl	120	6	1	6		1-20	21-30	31-120		___
2.Horse	150	5	1	5		1-15	16-20	21-35	36-150	___
3.Car	150	9	1/2	5		1-25	26-35	36-50	51-150	___
4.Face	180	12	1/2	6	1-35	36-50	51-75	76-180		___

JUMLAH:_____/33

The Malay Version of WISC-R

9. COMPREHENSION

Tamat jika gagal menjawab 4 soalan berterusan

Soalan	Skor' (2,1@0)
1. Apa patut dilakukan bila jari kita luka?	___
2. Bila kita jumpa dompet duit, apa yang perlu kita buat?	___
3. Kalau kita nampak asap tebal keluar dari rumah jiran kita, apa yang perlu kita lakukan?*	___
4. Kenapa kita perlukan polis?*	___
5. Kalau kita hilangkan bola yang kita pinjam dari kawan kita, apa yang perlu kita buat?	___
6. Jika budak lelaki/perempuan yang lebih kecil dari kita mengajak kita bergaduh, apa yang kita buat?	___
7. Apa kelebihan-kelebihan rumah batu dari rumah kayu?*	___
8. Kenapa kereta perlu nombor plet?*	___
9. Kenapa perompak mesti dipenjarakan?*	___
10. Kenapa kita perlu tampalkan setem pada surat?	___
11. Kenapa kerajaan perlu melantik pegawai untuk memeriksa nyamuk aedis?	___
12. Kenapa menderma pada tabung kebajikan lebih baik dari memberi duit pada peminta sedekah?*	___
13. Semasa pilihanraya, kenapa undi itu sulit?	___
14. Mengapa kulit buku tebal lebih baik dari buku kulit nipis?*	___
15. Kenapa kita mesti menepati janji?	___
16. Kenapa kain banyak dibuat dari kapas?	___
17. Apa faedahnya kita mempunyai ahli Parlimen?*	___
JUMLAH:	_____/34

Nota: 'skor bergantung kepada idea
*kemukakan soalan tambahan

10. CODING

Had Masa: 120 saat

JUMLAH: _____+ 50 = ____/93

IDENTIFICATION SUGGESTIONS--PERFORMANCE DATA

SCALES

The Renzull-Hartman Scale
for Rating Behavioral Characteristics of Superior Students*

Name _____ Date _____

School _____ Grade ____ Age ____ Yrs. ____ Mos.

Teacher or person completing this form _____

How long have you known this child? _____ Months.

DIRECTIONS. These scales are designed to obtain teacher estimates of a student's characteristics in the areas of learning, motivation, creativity, and leadership. The items are derived from the research literature dealing with characteristics of gifted and creative persons. It should be pointed out that a considerable amount of individual differences can be found within this population; and therefore, the profiles are likely to vary a great deal. Each item in the scales should be considered separately and should reflect the degree to which you have observed the presence or absence of each characteristic. Since the four dimensions of the instrument represent relatively different sets of behaviors, the scores obtained from the separate scales should not be summed to yield a total score. Please read the statements carefully and place an X in the appropriate place according to the following scale of values.

1. If you have seldom or never observed this characteristic.
2. If you have observed this characteristic occasionally.
3. If you have observed this characteristic to a considerable degree.
4. If you have observed this characteristic almost all of the time.

Space has been provided following each item for your comments.

SCORING. Separate scores for each of the three dimensions may be obtained as follows

Add the total number of X's in each column to obtain the "Column Total."

Multiply the Column Total by the "Weight" for each column to obtain the "Weighted Column Total."

Sum the Weighted Column Totals across to obtain the "Score" for each dimension of the scale.

Enter the Scores below.

Learning Characteristics..... _____

Motivational Characteristics..... _____

Creativity Characteristics..... _____

Leadership Characteristics..... _____

PART I: LEARNING CHARACTERISTICS

	1*	2	3	4
1. Has unusually advanced vocabulary for age or grade level; uses terms in a meaningful way; has verbal behavior characterized by "richness" or expression, elaboration, and fluency.				
2. Possesses a large storehouse of information about a variety of topics (beyond the usual interests of youngsters his age).				
3. Has quick mastery and recall of factual information.				
4. Has rapid insight into cause-effect relationships; tries to discover the how and why of things; asks many provocative questions (as distinct from information or factual questions); wants to know what makes things (or people) "tick."				
5. Has a ready grasp of underlying principles and can quickly make valid generalizations about events, people, or things; looks for similarities and differences in events, people, and things.				
6. Is a keen and alert observer; usually "sees more" or "gets more" out of a story, film, etc. than others.				
7. Reads a great deal on his own; usually prefers adult level books; does not avoid difficult material; may show a preference for biography, autobiography, encyclopedias, and atlases.				
8. Tries to understand complicated material by separating it into its respective parts; reasons things out for himself; sees logical and common sense answers.				
Column Total				
Weight	1	2	3	4
Weighted Column Total				
TOTAL				

*1--Seldom or never
2--Occasionally
3--Considerably
4--Almost always

*Exceptional Children, Volume 38, Number 3, November, 1971, pp. 211-214, 243-248 and Dorothy F. Syphers, Gifted and Talented Children: Practical Programming for Teachers and Principals. Arlington, Virginia: The Council for Exceptional Children, 1411 South Jefferson Davis Highway, Suite 900. Developers are Dr. Joseph Renzulli, University of Connecticut, and Robert A. Hartman, Darien City Schools, Connecticut. Children with the highest scores on each behavior can be ranked. The behavior scores used in the student profile will be determined by the type of program being established.

PART II MOTIVATIONAL CHARACTERISTICS

	1	2	3	4
1. Becomes absorbed and truly involved in certain topics or problems; is persistent in seeking task completion. (It is sometimes difficult to get him to move on to another topic.)				
2. Is easily bored with routine tasks.				
3. Needs little external motivation to follow through in work that initially excites him.				
4. Strives toward perfection, is self critical; is not easily satisfied with his own speed or products.				
5. Prefers to work independently; requires little direction from teachers.				
6. Is interested in many "adult" problems such as religion, politics, sex, race--more than usual for age level.				
7. Often is self assertive (sometimes even aggressive); stubborn in his beliefs.				
8. Likes to organize and bring structure to things, people, and situations.				
9. Is quite concerned with right and wrong, good and bad, often evaluates and passes judgment on events, people, and things.				
Column Total				
Weight	1	2	3	4
Weighted Column Total				
TOTAL				

PART III: CREATIVITY CHARACTERISTICS

	1	2	3	4
1. Displays a great deal of curiosity about many things; is constantly asking questions about anything and everything.				
2. Generates a large number of ideas or solutions to problems and questions; often offers unusual ("way out"), unique, clever responses.				
3. Is uninhibited in expressions of opinion; is sometimes radical and spirited in disagreement; is tenacious.				
4. Is a high risk taker, is adventurous and speculative.				
5. Displays a good deal of intellectual playfulness; fantasizes, imagines ("I wonder what would happen if..."); manipulates ideas (i.e., changes, elaborates upon them); is often concerned with adapting, improving, and modifying institutions objects, and systems.				
6. Displays a keen sense of humor and sees humor in situations that may not appear to be humorous to others.				
7. Is usually aware of his impulses and more open to the irrational in himself (freer expression of feminine interest for boys, greater than usual amount of independence for girls); shows emotional sensitivity.				
8. Is sensitive to beauty; attends to aesthetic characteristics of things.				
9. Is nonconforming; accepts disorder; is not interested in details; is individualistic; does not fear being different.				
10. Criticizes constructively; is unwilling to accept authoritarian pronouncements without critical examination.				
Column Total				
Weight	1	2	3	4
Weighted Column Total				
TOTAL				

PART IV: LEADERSHIP CHARACTERISTICS

	1	2	3	4
1. Carries responsibility well; can be counted to do what he has promised and usually does it well.				
2. Is self confident with children his own age as well as adults; seems confortable when asked to show his work to the class.				
3. Seems to be well liked by his classmates.				
4. Is cooperative with teacher and classmates; tends to avoid bickering and is generally easy to get along with.				
5. Can express himself well; has good verbal facility and is usually well understood.				
6. Adapts readily to new situations; is flexible in thought and action and does not seem disturbed when the normal routine is changed.				
7. Seems to enjoy being around other people; is sociable and prefers not to be alone.				
8. Tends to dominate others when they are around; generally directs the activity in which he is involved.				
9. Participates in most social activities connected with the school; can be counted on to be there if anyone is.				
10. Excels in athletic activities; is well coordinated and enjoys all sorts of athletic games.				
Column Total				
Weight	1	2	3	4
Weighted Column Total				
TOTAL				

UNIVERSITI PERTANIAN MALAYSIA
SOALSELIDIK GURU II

Maklumat Murid:

Nama:..... ....Kelas:.....
Sekolah:. .....Jantina:L/P

Arahan kepada guru:

Berikut ialah pernyataan mengenai murid ini. Oleh kerana setiap murid itu berbeza dengan murid yang lain, maka profil murid ini akan berbeza dengan murid lain. Sila teliti setiap pernyataan kerana dalam satu soalan mungkin terdapat lebih dari satu pernyataan. Penilaian anda untuk soalan itu boleh berdasarkan hanya satu pernyataan dalam soalan itu sahaja. Sila tandakan ( ) pada ruangan:

1 - jika anda **tidak pernah** mengalaminya,
2 - jika anda mengalaminya **sekali-sekala**,
3 - jika anda **selalu** mengalaminya,
4 - jika anda mengalaminya **sepanjang masa**.

BAHAGIAN 1
CIRI-CIRI PEMBELAJARAN

	1	2	3	4
1. Murid ini mempunyai perbendaharaan kata yang melebihi kanak-kanak yang seumur dengannya; menggunakan sesuatu perkataan dengan bermakna; pertuturannya 'kaya' iaitu jelas dan lancar.				
2. Dia mempunyai banyak maklumat mengenai banyak perkara/tajuk (luar biasa dari segi minat untuk mengetahui jika dibandingkan dengan kanak-kanak yang sebaya dengannya).				
3. Cepat menguasai/mengingati maklumat atau fakta.				
4. Menguasai dengan cepat sebab terjadinya sesuatu dan dapat mengaitkannya dengan yang lain; cuba menjawab kenapa dan bagaimana; mengemukakan soalan yang mencabar; ingin mengetahui isi kandungan dalam sesuatu perkara, benda atau manusia.				
5. Cepat memahami sesuatu prinsip; dapat membuat kesimpulan atau andaian tentang sesuatu peristiwa, kejadian, manusia dan lain-lain perkara.				
6. Dia ialah seorang pemerhati yang penuh dengan minat dan 'alert'; selalunya dapat memerhati lebih atau mengetahui lebeh dari kanak-kanak lain bila melihat/membaca/menonton/mendengar cerita, pelajaran dan lain-lain perkara.				

	1	2	3	
7. Banyak membaca tanpa disuruh (dengan kehendak sendiri); selalunya suka membaca atau mengetahui buku/bahan yang sepatutnya dibaca atau diketahui oleh orang dewasa; jarang meninggalkan bahan yang sukar; cenderung untuk mengetahui sejarah hidup orang yang ternama, membelek peta, merujuk kamus/ensaiklopedia.				
8. Cuba memahami bahan yang sukar dengan menggunakan pelbagai teknik umpamanya memisahkannya kepada beberapa bahagian; sentiasa cuba mencari jawapan untuk diri sendiri; jawapan yang diberi itu boleh diterima oleh akal dan logik.				

BAHAGIAN 2
CIRI-CIRI MOTIVASI

	1	2	3	4
1. Kadangkala minatnya terlalu tinggi kepada perkara-perkara yang tertentu sahaja; bila ini berlaku dia bersungguh-sungguh untuk mengelesaikan tugas yang diberi (kadangkala sukar untuk mengarahkan dia berhenti).				
2. Cepat bosan dengan kerja-kerja harian biasa.				
3. Dia kadangkala perlu dipujuk/dibelai/didera untuk meneruskan kerja/pelajaran yang mana pada awalnya diminati.				
4. Berusaha kearah kecemerlangan; kritical; jarang berpuashati dengan tugas/pencapaiannya.				
5. Lebih selesa belajar/bekerja dengan bersendirian; memerlukan arahan/tunjuk ajar yang sedikit dari guru.				
6. Berminat kepada masalah orang dewasa (masalah Agama, politik, dll.) yang mana berbeza dengan kanak-kanak yang seumur dengannya.				
7. Dia sangat tegas (kadangkala agressif); teguh dengan kepercayaannya.				
8. Cenderung untuk membawa sesuatu masalah kepada kehidupan seharian.				
9. Suka mengambil tahu tentang salah dan benar, baik dan jahat dan lain-lain; boleh menilai dan menghukum sesuatu kejadian, perbuatan manusia, dan peristiwa.				

BAHAGIAN 3
CIRI-CIRI KREATIVITI

	1	2	3	4
1. Sifat **ingin tahu** murid ini mengenai sesuatu perkara amat menonjol; selalu mengemukakan soalan mengenai apa sahaja perkara.	---	---	---	---
2. Mengemukakan banyak cadangan/buah fikiran bila diminta menyelesaikan sesuatu masalah; cadangan/buah fikirannya selalunya luarbiasa/unik/bijak.	---	---	---	---
3. Dia tidak takut mengeluarkan pendapat; semangatnya bertambah bila ada percanggahan pendapat; teguh dengan pendiriannya.	---	---	---	---
4. Tidak gentar akan akibat dari perlakuannya; suka membuat perkara yang baru/pelik; suka kepada keadaan yang tidak pasti.	---	---	---	---
5. Gaya intelektualnya menonjol; suka berangan-angan; membayangkan sesuatu (sebagai contoh dia seolah-olah berkata: Saya nak tahu apa yang akan berlaku jika...); menggunakan buah fikirannya dalam merancang kerja/tugas; suka mengubahsuai, memperbaiki, dan mencipta alat/permainan/benda.	---	---	---	---
6. Dia selalunya kelihatan gembira; dia boleh memahami sesuatu jenaka itu dengan cepat.	---	---	---	---
7. Bila diberi tugas, dia kadangkala mengabaikan keperluan pribadinya (makan, minum dll); bebas bekarja; sensitif/peka kepada hasil kerjanya.	---	---	---	---
8. Sensitif/peka/suka kepada benda-benda yang cantik/baru/bernilai tinggi.	---	---	---	---
9. Tidak mudah akur (menjadi pak turut); menerima keadaan yang tidak sempurna/selesa; individualistik; tidak takut kalau dia nampak berbeza dengan rakannya.	---	---	---	---
10. Kritik/pendapatnya membena; tidak mudah mengikut arahan guru/orang dewasa tanpa sebarang soalan.	---	---	---	---
	---	---	---	---

BAHAGIAN 4
CIRI-CIRI KEPIMPINAN

	1	2	3	4
1. Dia menjalankan tanggungjawab yang diberi dengan baik; janjinya dipenuhi; boleh diharap (menyelesaikan tugas tanpa diperhatikan/selia.	---	---	---	---
2. Menunjukan keyakinan diri yang tinggi bila bersama rakan atau orang yang lebih tua darinya; bila disuruh membuat persembahan dalam kelas, dia lebih yakin dari yang lain.	---	---	---	---
3. Dia sangat disukai oleh rakan sekelasnya.	---	---	---	---
4. Boleh bekerjasama dengan guru/rakan sekelasnya; suka mengendurkan keadaan yang tegang; selesa berkawan dengannya.	---	---	---	---
5. Dia dapat menonjolkan dirinya dengan baik; percakapannya selesa dan dapat difahami.	---	---	---	---
6. Dapat mengesuaikan diri dengan sebarang keadaan; pemikirannya/tindakannya fleksibel.	---	---	---	---
7. Selesa bila bersama orang yang ramai; mencari rakan bila kesaorangan.	---	---	---	---
8. Sering cuba untuk mempengaruhi rakan; dia yang mencadangkan aktiviti yang akan dilakukan bersama rakan.	---	---	---	---
9. Suka menagmbil bahagian dalam semua aktiviti sosial sekolah.	---	---	---	---
10. Cemerlang dalam aktiviti sukan; boleh bermain/menonton dan bergembira bila bermain/menonton dalam banyak aktiviti sukan.	---	---	---	---
	---	---	---	---

Maklumat guru:

Mata pelajaran utama anda mengajar murid ini:/.....
Adakah anda guru kelas murid ini sekarang? Ya/Tidak
Berapa lama anda mengenali murid ini?...../.....tahun
Pengalaman anda mengajar:.....tahun

TERIMA KASIH ATAS KERJASAMA TUAN/PUAN

Sila kosongkan.
Bhg 1 - ------
Bhg 2 - ------
Bhg 3 - ------
Bhg 3 - ------
Jumlah- ------

The English and The Malay Version of SFT

NAME: _____ SEX: BOY ☐ GIRL ☐

SCHOOL: _____ GRADE: 4th ☐ 5th ☐ 6th ☐

RACE: WHITE ☐ BLACK ☐ NATIVE AMERICAN ☐ ASIAN ☐ BIRACIAL ☐

SCHOOL FEELINGS AND THOUGHTS

Below are statements about school. Fill in one box beside each statement to tell how YOU feel about school. Three boxes have "yes" above them. Three boxes have "no" above them.

The YES means you agree very much.
The YES means you agree quite a bit.
The yes means you agree just a little bit.
The no means you disagree just a little bit.
The NO means you disagree quite a bit.
The NO means you disagree very much.

		YES	YES	yes	no	NO	NO
1.	I feel terrible when I make a mistake in school.	[]	[]	[]	[]	[]	[]
2.	Difficult tasks are more fun than easy ones.	[]	[]	[]	[]	[]	[]
3.	If I can't work a problem, I give up and put it away.	[]	[]	[]	[]	[]	[]
4.	A low mark in my school work makes me feel very sad.	[]	[]	[]	[]	[]	[]
5	I like difficult tasks even if I make mistakes on them.	[]	[]	[]	[]	[]	[]
6.	I hide or throw away papers if my score is low.	[]	[]	[]	[]	[]	[]
7.	I worry a lot about making errors in my school work.	[]	[]	[]	[]	[]	[]
8.	School work that really makes me think is fun.	[]	[]	[]	[]	[]	[]
9.	I correct mistakes on my school work, even if I don't have to.	[]	[]	[]	[]	[]	[]
10.	I am scared to learn new things because I hate to make mistakes.	[]	[]	[]	[]	[]	[]
11.	I like to work problems that don't take much thinking.	[]	[]	[]	[]	[]	[]
12.	When I cannot solve a problem, I ask for help.	[]	[]	[]	[]	[]	[]

		YES	YES	yes	no	NO	NO
13.	I hate to set goals, because if I don't reach them, I feel sad.	[]	[]	[]	[]	[]	[]
14.	I hate difficult problems or assignments.	[]	[]	[]	[]	[]	[]
15.	If I make mistakes in school, I feel moody or angry.	[]	[]	[]	[]	[]	[]
16.	When I get a low score, I try to find ways to improve my work.	[]	[]	[]	[]	[]	[]
17.	I like hard problems better than easy ones, even if I make mistakes.	[]	[]	[]	[]	[]	[]
18.	If I get a low grade on a paper, I correct the errors I made.	[]	[]	[]	[]	[]	[]
19.	I learn from my wrong answers; so they don't bother me much.	[]	[]	[]	[]	[]	[]
20.	If I don't know something, I guess rather than ask for help.	[]	[]	[]	[]	[]	[]
21.	I like school best when we have easy work to do.	[]	[]	[]	[]	[]	[]
22.	I feel ashamed when I make errors in school.	[]	[]	[]	[]	[]	[]
23.	When I fail a school task, I study the mistakes I made.	[]	[]	[]	[]	[]	[]
24.	It is fun to answer questions that really make me think.	[]	[]	[]	[]	[]	[]
25.	I don't talk about my school work if my score is low.	[]	[]	[]	[]	[]	[]
26.	If I give a wrong answer to a teacher's question, I feel terrible.	[]	[]	[]	[]	[]	[]
27.	If I could pick my school work, I would choose very easy tasks.	[]	[]	[]	[]	[]	[]

Note: Revised version of School Failure Tolerance Scale, developed by Margaret M. Clifford (1988). Failure tolerance and academic risk-taking in ten- to twelve-year-old students. British Journal of Educational Psychologyt, 58, 15-27.

The Malay Version of SFT

UNIVERSITI PERTANIAN MALAYSIA
SOALSELIDIK MURID

Nama:_____ Sekolah:_____
Darjah:_____ Jantina: L/P Tarikh Lahir:_____

Perhatian: ID:_____

Ini BUKAN ujian. Tidak ada satupun jawapan yang benar atau yang salah. Kami cuma ingin tahu PERASAAN anda sahaja. Terdapat 3 kotak untuk 'ya' dan 3 kotak untuk 'tidak'. Tandakan (**X**) pada kotak selepas pernyataan:

YA - ialah anda sangat bersetuju.
YA - ialah anda bersetuju.
ya - ialah anda bersetuju sekali-sekala
tidak - ialah anda kadangkala tidak bersetuju.
TIDAK - ialah anda tidak bersetuju.
TIDAK - ialah anda sangat tidak bersetuju

	YA	YA	ya	tidak	TIDAK	**TIDAK**	
1. Saya serba salah bila lakukan kesilapan di sekolah.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	
2. Saya rasa sangat sedeh bila dapat markah rendah.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	
3. Saya sangat risau bila buat saya lakukan banyak kesilapan semasa belajar.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	
4. Saya takut belajar pelajaran baru sebab saya takut buat kesilapan.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	
5. Saya tidak bercita-cita tinggi sebab kalau tidak tercapai, saya akan bersedeh.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	
6. Jika saya buat kesilapan di sekolah saya rasa tidak selesa/marah.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	
7. Saya belajar dari kesilapan, oleh itu saya tidak kesah kalau salah.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]*	
8. Saya malu bila buat salah masa guru mengajar.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	
9. Kalau jawapan saya pada soalan guru salah, saya rasa serba salah.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	++
10. Belajar yang susah lebih seronok dari belajar yang senang.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]*	
11. Saya suka pelajaran yang sukar walaupun saya banyak lakukan kesilapan.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]*	
12. Pelajaran yang membuatkan saya benar-benar berfikir amat saya sukai.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]*	

	YA	YA	ya	tidak	TIDAK	TIDAK
13. Saya suka cuba selesaikan kerja yang sukar dari kerja yang mudah	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
14. Saya benci pada kerja rumah.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
15. Saya suka kerja rumah yang sukar dari yang senang walaupun saya akan lakukan banyak kesalahan.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]*
16. Saya suka ke sekolah bila semua pelajaran itu senang dipelajari.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
17. Saya seronok memberi jawapan pada soalan yang sukar.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]*
18. Kalau saya boleh pilih, saya pilih pelajaran yang senang.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ] ++
19. Kalau saya tidak dapat buat kerja sekolah, saya biarkan sahaja.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
20. Saya sembunyikan/buang hasil kerja yang dapat markah rendah.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
21. Saya betulkan kerja rumah yang saya salah buat walaupun cikgu tidak suruh.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]*
22. Bila saya tidak dapat selesaikan kerja rumah, saya minta orang lain bantu.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]*
23. Bila markah saya rendah, saya akan cari jalan untuk mendapat markah yang lebih baik.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]*
24. Bila jawapan saya salah, saya akan mencari jawapan yang betul.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]*
25. Bila saya tidak dapat mencari jawapan, saya lebih suka teka dari bertanya.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
26. Bila saya gagal menyelesaikan kerja rumah, saya cari sebabnya.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]*
27. Kalau cikgu beri pilihan, saya lebih suka menjawap soalan yang senang.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ] ++

++_____
++_____
++_____

Parent Interview

Disregarding test results, would you rate your child?

Check the column which best describes your child's intellectual functioning for his/her age level. These items include a range of possible characteristics or objectives. A child is not expected to be high on all of them.

NOTE: Adapted from - The Identification of the Gifted and Talented by Ruth Martinson, 1975.

Item to be evaluated	Little 1	2	Moderate 3	4	Much 5
1. Knowledge and skills (Possesses a comfortable knowledge of basic skills and factual information)					
2. Concentration (has ability to concentrate; is not easily distracted)					
3. Enjoyment of learning (likes doing)					
4. Persistence (has ability and desire to follow through on work; concerned with competition; able to see a problem through)					
In own interests.....					
In assigned tasks....					
5. Responsive (is easily motivated; responsive to adult suggestions and questions)					
6. Intellectual curiosity (pursues interests primarily to understand or satisfy curiosity; questions the common, ordinary, or the unusual; wants to know how and why; generates questions of his own, in connection with personal interests or group concerns)					
7. Challenge (Enjoys the challenge of difficult problems, tasks, issues, and materials)					
8. Perceptiveness (Is alert, perceptive, and observant beyond his years; aware of many stimuli)					
9. Verbal facility (Shows marked facility with language; uses many words easily and accurately)					
10. Fluency of ideas (Produces a large number of ideas or products, often very quickly)					
11. Flexibility (Is able to approach ideas and problems from a number of perspectives; adaptable; able to find alternative ways of solving problems)					
12. Sensitivity to problems (Perceives and is aware of problems that others may not see; is ready to question or change existing situations and suggest improvements)					
13. Originality (Often uses original methods of solving problems, is able to combine ideas and materials in a number of ways, or create products of unusual character or quality)					
14. Imagination (Can freely respond to stimuli with the production of mental images; may "play" with ideas or produce remote, fanciful associations or insights)					
15. Reasoning (Is logical, often generalizes or applies understanding in new situations, expands concepts into broader relationships, or sees parts in relation to the whole)					
16. Scientific method (Can define problems, formulate hypotheses, test ideas, and arrive at valid conclusions)					
17. Independence in thought (Inclined to follow his organization and ideas rather than the structuring of others)					
18. Independence in action (Able to plan and organize activities, direct action, and evaluate results)					

Item to be evaluated	Little 1	2	Moderate 3	4	Much 5
9. Verbal facility (Shows marked facility with language; uses many words easily and accurately)					
10. Fluency of ideas (Produces a large number of ideas or products, often very quickly)					
11. Flexibility (Is able to approach ideas and problems from a number of perspectives; adaptable; able to find alternative ways of solving problems)					
12. Sensitivity to problems (Perceives and is aware of problems that others may not see; is ready to question or change existing situations and suggest improvements)					
13. Originality (Often uses original methods of solving problems, is able to combine ideas and materials in a number of ways, or create products of unusual character or quality)					
14. Imagination (Can freely respond to stimuli with the production of mental images; may "play" with ideas or produce remote, fanciful associations or insights)					
15. Reasoning (Is logical, often generalizes or applies understanding in new situations, expands concepts into broader relationships, or sees parts in relation to the whole)					
16. Scientific method (Can define problems, formulate hypotheses, test ideas, and arrive at valid conclusions)					
17. Independence in thought (Inclined to follow his organization and ideas rather than the structuring of others)					
18. Independence in action (Able to plan and organize activities, direct action, and evaluate results)					
19. Independence and work habits (Requires a minimum of adult direction and attention)					
20. Elaboration (Concerned with detail and complexity; often involved with a variety of implications and consequences)					
21. Aesthetic appreciation (enjoys and is responsive to beauty in the arts or nature)					

The Parent Rating scale

UNIVERSITI PERTANIAN MALAYSIA
TEMUBUAL PENJAGA

Maklumat Diri
Nama Murid:..... Kod:.....
Jantina Penjaga: Lelaki/Perempuan
Umur:.....tahun
Pekerjaan:.....
Darjah/Tingkatan Tertinggi:.....
Bilangan anak:.....

Arahan:
Dengan mangabaikan keputusan ujian anak anda di sekolah, sila nyatakan pendapat anda tentang anak anda berdasarkan pernyataan berikut:

PERNYATAAN	Jarang-----Selalu 1	2	3	4	5
1. Pengetahuan dan kemahiran (mempunyai pengetahuan yang cukup mengenai kemahiran asas dan fakta asas).	___	___	___	___	___
2. Tumpuan (boleh memberi perhatian; tidak mudah terganggu bila bekerja).	___	___	___	___	___
3. Minat belajar (suka buat sesuatu).	___	___	___	___	___
4. Persistence (berkebolehan dan ingin meneruskan sebarang kerja; suka bersaing; boleh menyelesaikan tugas yang diberi).					
a. Melalui minatnya sendiri	___	___	___	___	___
b. Hanya bila disuruh	___	___	___	___	___
5. Responsive (mudah digerakkan (motovasi); mengambilkira sebarang saranan dan soalan dari orang tua).	___	___	___	___	___
6. Ingin tahu (berminat untuk mengetahui lebeh lagi tentang sesuatu perkara; bertanya kenapa berbeza, sama dll; ingin tahu kenapa dan mengapa; bertalu-talu bertanya mengenai perkara-perkara yang dia ingin tahu).	___	___	___	___	___
7. Mencabar (suka kepada kerja atau tugas yang mencabar atau sukar).	___	___	___	___	___
8. Perceptiveness (lebih alert, perceptive, dan observant dari rakan yang seumur dengannya; tahu tentang banyak perkara).	___	___	___	___	___

	Jarang------Selalu 1 2 3 4 5
9. Kebolehan bertutur (menggunakan bahasa yang betul bila bercakap; ayat dan perkataan yang diguna betul).	___ ___ ___ ___ ___
10. Kelancaran idea (melahirkan banyak pendapat secara spontan).	___ ___ ___ ___ ___
11. Fleksibeliti (boleh menyelesaikan masalah/tugas dengan berbagai cara; boleh menyesuaikan banyak alat; boleh mencari berbagai cara untuk menyelesaikan masalah/tugas).	___ ___ ___ ___ ___
12. Peka kepada masalah (lebeh cepat dari rakannya mengangkap sesuatu masalah; sedia untuk bertanya/memberi pendapat/idea).	___ ___ ___ ___ ___
13. Originaliti (mencipta sendiri cara untuk selesaikan masalah; dapat menggunakan idea dan bahan dengan berbagai cara atau dapat mereka sesuatu yang luarbiasa).	___ ___ ___ ___ ___
14. Imaginasi (sering berangan-angan; berlakon sendiri dengan cerita yang direkanya).	___ ___ ___ ___ ___
15. Taakulan (alasan/pendapat yang diberi itu logik/dapat digunakan/bijak).	___ ___ ___ ___ ___
16. Cara saintifik (boleh mengenali masalah, membentuk hipotisis, menguji idea/pendapat dan membuat kesimpulan).	___ ___ ___ ___ ___
17. Bebas pemikiran (tidak mudah dipengaruhi pendapatnya).	___ ___ ___ ___ ___
18. Bebas berpelakuan (dapat merancang dan mengendalikan aktiviti sendiri; memberi arahan dan menilai hasilnya).	___ ___ ___ ___ ___
19. Bekerja sendiri (memerlukan arahan dan penyeliaan yang sedikit).	___ ___ ___ ___ ___
20. Eloboration (perihatin/concern dengan perkara yang selanjutnya; suka kepada tugas yang mencabar dan memberi kesan).	___ ___ ___ ___ ___
21. Menilai aesthatic (suka kepada kecantikan, kejadian semula jadi dan benda yang bernilai).	___ ___ ___ ___ ___
	Jumlah:

TERIMA KASIH ATAS KERJASAMA ANDA

The Statictics Regarding the Effectiveness of SFT in Identifying Intellectually Gifted Children

Table VI.1
Discriminant Analysis for the subtests of SFT
(N=303)

Step	Variable	Wilks' Lambda	Sig
1	Aff	.9820	.0194
2	P.D	.9763	.0274

Table VI.2

Predictive Classification Result for Intellectually and non-intellectually Gifted
(N=303)

Fisher's Linear Discrimination Function

Variables	non-Intellectually Gifted	Intellectually Gifted
Aff	.7241	.7713
PD	.9906	1.0197
(Constant)	-27.8636	-30.2125

Classification Results

	Predicted Group Membership	
Group	non-gifted	Gifted
non-Gifted	116(57.4%)	86(44.6%)
Gifted	41(40.6%)	60(59.4%)

Table VI.3

Prediction Equation of Full IQ
based on two subtests of SFT
(Forced entry Procedure of Multiple Regression)

Subtests	B	Beta	T	Sig.T
Aff	.42	.18	3.18	.0016
PD	.26	.11	2.02	.0447
(constant)	88.52		16.36	.0000

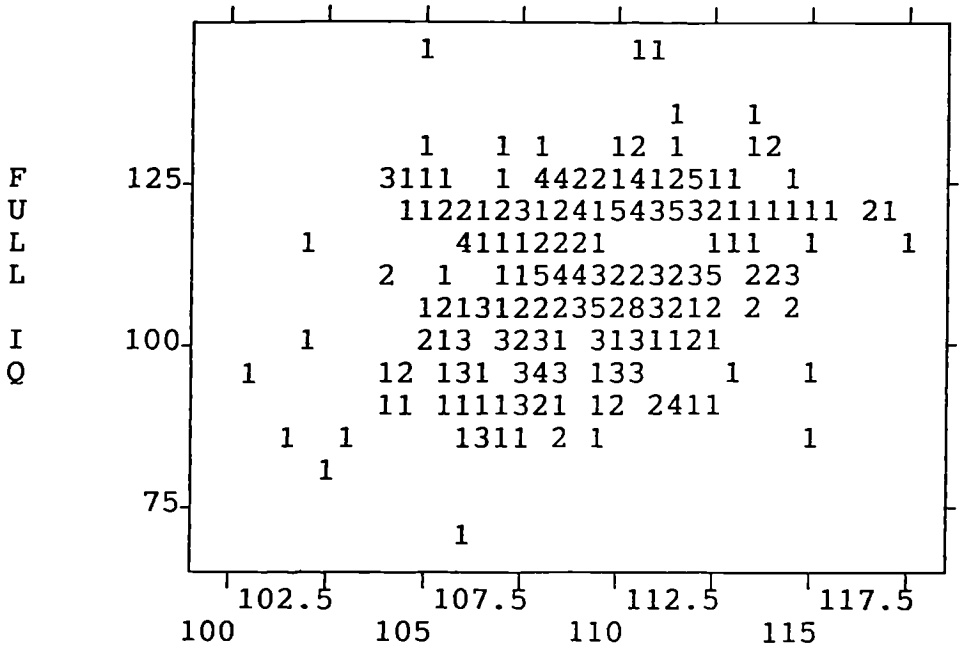
R^2=.05 SE=12.58 $F_{(2,300)}$ p=.0003

Equation used to predict Full IQ
based on two subtests of SFT:

Predicted IQ (PIQS)=.42(Aff)+.26(PD)+55.52

Graph VI.1

PLOT OF IQ WITH PIQS



The Statictics Regarding the Effectiveness of Parent's Rating in Identifying Intellectually Gifted Children

Table VII.1

A Summary of Discriminant Function Analysis

Fisher's Linear Discrimination Function

Variables	Non-Intellectually Gifted	Intellectually Gifted
Father	1.0740	1.1529
(Constant)	-36.4664	-41.9147

Classification Results

	Predicted Group Membership	
Group	non-gifted	Gifted
non-Gifted	128(63.7%)	73(36.3%)
Gifted	36(36.4%)	63(63.6%)

Equation proposed to predict Full IQ:

Predicted IQ=.51(Father)+74.50.

Note: This equation has standard error (SE) of 12.08 and is significant in predicting Full IQ score ($F_{(1,302)}$=35.28 p=.0000).

Graph VII.1

PLOT OF IQ WITH PIQP