CHAPTER 3

RESEARCH METHODOLOGY

3.0 Introduction

This case study investigates factors influencing the academic achievement of Standard VI pupils of the National-type Primary Tamil School, Sungai Rengam (PTSSR) in the Petaling District of Selangor Darul Ehsan. It attempts to look into the relationships between academic achievement and a number of pupil factors, parental factors and school factors which have been found to affect school academic achievement.

3.1 Definitions and Operationalization of Variables

There are two categories of variables in this case study. The dependent variable is academic achievement as measured by the performance of PTSSR Standard VI pupils in the Primary School Achievement Test Ujian Penilaian Sekolah Rendah or (UPSR). The independent variables are selected pupil, school and parental factors, the details of which are shown in Table 3.1.

Table 3.1

Categorisation of Variables

Independent Variables	Dependent Variables	
Pupil Factors	**Academic Achievement**	
Sex Socio-economic status IQ Kindergarten education Frequency of absence from school Self-perception of ability in class Tuition Pupils' academic and occupational aspirations	Primary School Achievement Test in Standard VI, 1991	Aggregate Score of Six Subjects- Bahasa Malaysia (Comprehension) Bahasa Malaysia (Composition) Tamil (Comprehension) Tamil (Composition) English Language Mathematics
School Factors	Aggregate scores in UPSR to indicate level of Achievement :	Level of Achievement (Individual-Student)
Teachers' professional & academic qualifications Teachers' experience Workload of teachers Classroom instruction		Low (06-09 points) Medium (10-20 points) High (21-30 points)
Parental Factors		Level of Achievement (individual-subject)
Parental praise for educational success Encouragement to the child to work hard Parents' knowledge of pupils' progress Parents' reaction to child's performance in school Parents' attention to child's learning difficulties Educational & occupational aspirations for the child		Pass (Grades A-C) Fail (Grades D-E) Achievement by grades are compared with the national norm of each subjects.

3.1.1 Academic Achievement

Academic achievement - the dependent variable - is measured by performance in the UPSR which is a national examination for all Standard VI pupils in Malaysia. In the UPSR, student performance in each school subject is graded. For the purpose of aggregation, these grades are converted into points where A=5 points, B= 4 points, C=3 points, D=2 points and E=1 point. Grades A is excellent, B is credit, C is pass, and D and E are failures. The total number of points scored for the six papers taken in UPSR is computed for each pupil, the maximum being 30 points and the minimum being 6 points.

Based on the total score, the proposed cut-off points for categorization of low, medium and high achievers are based on the distribution of the sample pupils in the normal curve (the mean was 15.2 and the standard deviation was 5.8). Pupils with a total score of 9 and below are considered as low achievers, between 10 and 20 points as medium achievers, and from 21 to 30 points as high achievers. For purposes of individual subject analysis, only two categories are used i.e `pass' (meaning Grades A,B and C) and `fail' (indicat-

ing grades D and E). These grades (A to C) and (D to E) are compared with the national norm of each of the subjects in the UPSR. Also, these grades have been utilized by the state education Departments to categorise high, medium and low achieveing schools.

3.1.2 Classification of Socio-Economic Status

One of the most important factors influencing school performance is socio-economic status (SES) which is a measure of parental income, occupation, and, level of education. In this study, the SES index is measured by the father's educational attainment. The significant relationship between the father's educational attainment and the pupils' academic achievement had been supported by several research studies (Sudarsono, 1984; Alwin and Thornton, 1984; Ballantine, 1989; Lockheed, 1989; Aziz, 1989; Leong et al.; Walberg, 1991). The father's educational attainment of PTSSR pupils were categorized into three groups, namely, primary education, lower secondary (Forms 1 to 3) and upper secondary (Forms 4 and 5). None of the fathers in the sample received an education higher than secondary school level.

3.1.3 The Cattel Culture Fair Intelligence Test (CCFIT)

The importance of IQ as a predictor of academic achievement had been tested in previous studies. Henderson et al. (1976) found that IQ had a positive correlation with academic achievement. Entwistle and Hayduk (1981) concluded that children's gender and IQ shaped their school performance.

As indicated by Chiam (1976), the non-verbal test was more appropriate for measuring the IQ of Malaysians. This narrowed the choice of an IQ test to two well-known non-verbal tests, namely, the Raven's Progressive Matrices and the Cattel Culture Fair Intelligence Test. In this study, the Cattel Culture Fair Intelligence Test (CCFIT), Scale 2 was used to measure pupils' IQ.

The CCFIT was selected because it is a non-verbal intelligence test, hence reducing the probability of culture-biased errors. Furthermore, it could be conducted both at the individual and group levels. The CCFIT instrument had been used in previous studies in Malaysia (Chiam, 1976 and Yong, 1986) and its reliability and validity have been established.

The CCFIT, Scale 2, applicable for young people between 8 and 14 years of age, and including non-college adults, consists of two separate tests, namely Forms A and B. Both Forms A and B have been used in the study. Items and time allotted to each of the sub-tests in Scale 2 (Form A or B) are shown in Table 3.2.

Table 3.2

Items and Time Allotted to Each Sub-test in CCFIT, Scale 2

Form A or B	Type of Relation	Number of Items	Time Allotted (in mins)
Test 1	Series	12	3
Test 2	Classifi-cations	14	4
Test 3	Matrices	12	3
Test 4	Conditions	8	2 1/2
Total		46	12 1/2

Source. R.B.Cattell and A.K.S. Cattell, Culture Fair Intelligence Test , Scale 2, Form A and B, Champaign, Illinois, Institute for Personality and Ability Testing, 1960.

3.1.4 Other Pupil Factors

Besides SES and IQ, other pupil factors relate to sex, kindergarten education, frequency of being absent from school, self-perception, and academic and occupational aspirations.

3.1.5 School Factors

Overall, studies have reiterated the importance of school factors and their contribution to academic achievement. In this study, school factors pertaining to teacher background (academic and professional qualification, and teaching experience), teacher workload (number of periods taught in a week, co-curricular activities and other responsibilities in school) and classroom instruction are examined.

Where classroom instruction is concerned, observations have been made of selected lessons in Bahasa Malaysia, English, Tamil, and Mathematics. The aim of the classroom observations was to observe the effectiveness of teaching and learning outcomes. A pedagogical level of analysis (Kyriacou,1992) was used. The pedagogical level of analysis had emerged largely from the perspective of effective teaching employed by teacher educators. It concerns the attempt to describe the craft of teaching in a way that is of value to both student teachers and experienced teachers. The analysis emphasises teacher presentation, content, structure,

monitoring and evaluation of lessons and activities. The Faculty of Education's teaching practice evaluation form was used to evaluate teacher performance in the classrooms.

3.1.6. Parental Factors

In the literature, different terms have been used to describe the support given by parents, namely, `parental participation', `parental involvement', `parental encouragement', and `parental asisstance'. In this study, the term `parental factor' refers to behaviour or activities of parents which indicate support of the child in the learning process at home. An assumption of this study is that the mere provision of uniforms, books and transportation does not constitute parental support. Principally, parental support refers to the process variables of the home such as parental praise for success, encouragement to work hard, parents' knowledge of pupils' progress, reaction to pupils' school performance, attention to pupils' learning difficulties, and educational and occupational aspirations of parents for their children.

3.2. The School (PTSSR)

The school selected for this study is the National Type Primary Tamil School, Sungai Rengam (PTSSR) in the Petaling District of Selangor Darul Ehsan. PTSSR has been selected because it is representative of the 16 Tamil schools in the Petaling district from the viewpoint of academic achievement and selected pupil, school and parental factors used in this study.

3.2.1. History of the School

PTSSR is situated in Jalan Pinang 18/1, Section 18 of Shah Alam. The school, originally known as the Sungai Rengam Estate Tamil School, was built in 1937. It ceased to function from 1942 to 1946 with the outbreak of the Second World War.

In order to accommodate the rapid development of a housing project by the Selangor State Development Corporation (Perbadanan Kemajuan Negeri Selangor or PKNS), the PTSSR was shifted to a temporary building in Section 18 of Shah Alam in 1983. The school had only

two blocks of temporary wooden buildings with six classrooms, an office, a canteen and two toilets. The amenities were made available by the PKNS.

Since 1983, PTSSR has undergone some changes. Due to the efforts of the Parents' Teacher Association and the school's Board of Directors, four additional classrooms, a storeroom and a staff room have been built. Given the rapid increase in enrolment , from 141 pupils in 1982 to 1,090 pupils in 1991, the school administration is facing difficulties in providing basic facilities for its population.

3.2.2 Academic Achievement of the School

A gradual improvement in school performance in the UPSR examination has been observed. In 1989, 14.5% of its pupils passed all the subjects in UPSR. For the following year, 1990, the pass rate was 20% while in 1991, it was 24.7%.

As shown in Table 3.3, the UPSR results of the school suggest variation in terms of academic perform-

Table 3.3

Pupil Achievement in the UPSR Examination by Subjects (1989 - 1991)

Subjects	Year of Examination and Grades											
	1989				1990				1991			
	A	B	C	D & E	A	B	C	D & E	A	B	C	D & E
Tamil Language												
Comprehension	31.7 (19)	20.0 (12)	21.6 (13)	26.7 (16)	30.5 (32)	34.3 (36)	21.0 (22)	14.2 (15)	26.8 (38)	32.4 (46)	16.2 (23)	24.6 (35)
Composition	10.0 (6)	25.0 (15)	11.7 (7)	53.3 (32)	0.9 (1)	10.5 (11)	21.0 (22)	67.6 (71)	3.5 (5)	21.8 (31)	27.5 (39)	47.2 (67)
Bahasa Malaysia												
Comprehension	16.7 (10)	11.7 (7)	31.6 (19)	40.0 (24)	5.7 (6)	24.8 (26)	25.7 (27)	43.8 (46)	2.1 (3)	10.0 (14)	32.2 (45)	55.7 (78)
Composition	0 (6)	10 (6)	11.7 (7)	78.3 (47)	0 (0)	11.4 (12)	27.6 (29)	61.0 (64)	0.7 (1)	4.3 (6)	23.6 (33)	71.4 (100)
English Language	10.0 (6)	21.6 (13)	21.6 (13)	46.7 (28)	4.8 (5)	28.6 (30)	47.6 (50)	19.0 (20)	6.3 (9)	12.0 (17)	31.7 (45)	50.0 (71)
Mathematics	10.0 (6)	16.7 (10)	38.3 (23)	35.0 (21)	12.4 (13)	32.4 (34)	31.4 (33)	23.8 (25)	4.3 (6)	11.4 (16)	35.7 (50)	48.6 (68)

Note. Figures given are in percentages. However, figures within brackets indicate the number of respondents involved.

ance in all the subjects, namely, Bahasa Malaysia, English, Tamil and Mathematics. In Tamil (Composition), 10% of the pupils obtained grade A in 1989 while only 0.9% obtained a similar grade in 1990. However, 3.5% obtained grade A in the examination in 1991.

English Language results show a similar trend in terms of grade A scores. For example, 10% of the pupils obtained grade A in the 1989 examination whereas only 4.8% obtained a similar grade in 1990. In 1991, 5.3% of the pupils obtained grade A.

As for Bahasa Malaysia (Composition), the result was unsatisfactory. A mere 0.7% of the pupils obtained grade A in the year 1990 whereas none of them obtained grade A in 1989 and 1991. For the year 1989, 78.3% failed the paper and the failure rate was 61% for 1990 and 71.4% for 1991.

In Mathematics, 10% of the pupils obtained grade A in 1989 while 12.4% obtained a similar grade in 1990. However only 4.3% obtained grade A in the 1991 examination. Generally, the results suggest variation in all the UPSR examination subjects.

3.2.3 Pupil, Parental and Teacher Background

Most of the pupils in this school are from low SES families (78.3%). Only a small percentage are of medium SES background (18,2). The number of pupils of high SES is negligible (3.5%).

The school serves the population living in the surrounding areas of Shah Alam (from Section 16 to 19 and 24), Padang Jawa, Sri Muda, Taman Alam Megah and along the railway line. Most of the parents (72.3%) are labourers. A small proportion of the parents work as sales clerks, drivers, college-trained teachers and insurance agents.

Eight teachers are teaching all the subjects in the Standard VI classes. Of the eight teachers, seven are trained professionally and possess the SPM or STPM qualification. The untrained teacher has a university degree. Six of them have been teaching from two to eight years. While the senior teacher has 25 years of teaching experience, the untrained graduate teacher has been teaching for less than a year.

3.3 Selection of Sample Pupils, Teachers and Parents

The population in this study consists of 142 Standard VI pupils whose average age is 12 years. The pupils sat for the UPSR examination in 1991. Pupils in this age group often rely on parental guidance. As indicated by Kalinowski and Sloane (1981), this age group is subjected to home influence. Bloom (1980), found the age of 12 or thereabouts to be a period of rapid development of human characteristics important for success.

Where the teachers are concerned, the sample consists of all four teachers teaching various subjects in Standard VI classes. As for Bahasa Malaysia and English, teachers who were teaching all the four classes were selected. (At the primary level, there is a tendency for the class teacher to teach all the subjects, the exception being Bahasa Malaysia, English and Music).

A sample of 32 parents representing low, medium and high achieving pupils was selected out of a total

of 142 parents. The pupils were categorized as low, medium and high achievers, based on the total scores of all the six subjects in UPSR . Of the 32 parents selected, 11 were from the low achievers' group, 14 from the medium group and 7 represented the high achievers.

3.4 Instruments

The test instruments consist of a pupil questionnaire (Appendix A), CCFIT (Appendix B), teachers' questionnaire (Appendix C), headmaster's questionnaire (Appendix D), and parents' interview schedule (Appendix E). For the purpose of classroom observation, the University of Malaya's Faculty of Education teaching practice evaluation form (Appendix F) was used.

3.4.1 Pupil Questionnaire

This questionnaire (Appendix A) consists of 24 items. The first three items relate to the name of the pupil, class and ethnic origin. Item 4 to 14 relate to pupil factors such as sex, SES, kindergarten education, frequency of absence from school, self-perception of

ability in class, tuition, and pupils' academic and occupational aspirations. Items 15 to 24 relate to parental factors such as parental praise for educational success, encouragement given to the child to work hard, parental knowledge of pupils' progress, parental reaction to the child's performance in school and educational and occupational aspirations for the child.

3.4.2 Teacher Questionnaire

This questionnaire (Appendix C) contains 18 items related to teachers. The first four items relate to sex, marital status, ethnic origin and the age of teachers. Items 5 to 18 relate to a teacher's option subjects in training , level of training, school subjects taught, academic qualification, experience, responsibilities, workload and perception of school climate.

3.4.3 Headmaster Questionnaire

The questionnaire (Appendix D) consists of 18 items. The items relate to information about school

background, pupils, and teachers (items 1 - 10). Items 11 to 18 relate to information such as school facilities, school performance and problems faced by school administrators.

3.4.4 Parent's Interview Schedule

The interview schedule (Appendix E) relate to parental factors such as parental praise for educational success, encouragement to the child to work hard, parents' knowledge of pupils' progress, parents' reaction to a child's performance in school, parents' attention to a child's learning difficulties and, educational and occupational aspirations for the child (Items 1- 17). Items 18 to 22 relate to parents' perception towards PTSSR.

Most of the pupil, teacher and headmaster questionnaire and parent's interview schedule items were compiled from research on academic achievement carried out by Isahak (1977), Ndapatondo (1978), Sudarsono (1984), Aziz (1989) and Leong and others (1990). The questionnaires and interview schedule items were

validated by two lecturers within the Faculty of Education, University of Malaya.

Where the questionnaires were concerned, those for the pupils, teachers and headmaster were translated from English to Tamil, the latter being the medium of instruction in PTSSR . Two lecturers in Tamil from Maktab Perguruan Seri Kota (Seri Kota Teacher Training College) were selected to translate the questionnaires from Tamil to English. A match between the two translations - English to Tamil and Tamil to English - is an indication of the accuracy of the translation. The same procedure was followed in verifying the accuracy of the translation of the parents' interview schedule and the 'detailed instructions' of the CCFIT from English to Tamil.

3.5 Pilot Study

The National-Type Primary Tamil School, Serdang (PTSS) was used for the pilot study. The PTSS is similar to the PTSSR in terms of academic achievement and selected pupil, school and parental factors used in the

study. The pilot study, administered personally, was conducted in September 1991.

As the Standard VI classes were streamed according to ability, Standard VI A (6 Teratai), Standard VI B (6 Melur) and Standard VI C (6 Cempaka) pupils were selected to represent low, medium and high achievers. With the assistance of the class teachers, a group of 10 low, medium and high achievers each constituted the sample of 30 pupils in the pilot study.

The sample concerned responded to the questionnaire for pupils and CCFIT. The administration of the pupil questionnaire took an hour and ten minutes which included the time for instructions given to the respondents regarding the purpose of the the questionnaire. A week later, questions which require the opinion of pupils were re-administered to the sample to test for the reliability of the questionnaire. To ascertain this, the test-retest reliability technique was used for questions that required the opinion of the respondents. Using Spearman's Rank Order Correlation to compute the reliability of the questionnaire, a value of $r = 0.79$ was obtained.

Three Standard VI teachers (a class teacher, who was teaching Tamil and Mathematics, and a Bahasa Malaysia and English teacher who were teaching the six UPSR subjects) constituted the sample of the pilot study. These teachers were briefed on the objective of the study and the need to respond adequately to the items in the questionnaire. They were also asked to comment on the clarity of the items and make any other suggestions where appropriate. The administration of the teacher questionnaire took 35 minutes.

Based on the school-based examination, the teachers identified the pupils from three levels of achievers namely, low, medium and high achievers. Two parents each of low, medium and high achievers were selected for the purpose of the pilot study. Using the interview schedule, these parents were interviewed at home.

The purpose of the pilot study was to verify the questionnaire and interview items. In addition, the pilot study provided the opportunity to improve on administrative procedures prior to the collection

of data for the main study. Based on feedback received, some of the items had to be re-worded for clarity. For example, items 18 and 21 of the pupil questionnaire on parental knowledge of pupils' progress and importance of homework were re-worded for clarity.

3.6 Administration of Instruments

A period of four weeks from 19 September to 20 October, 1991 was set aside for the collection of data. The collection of data was administered personally. The questionnaires for the pupils, together with the CCFIT, were administered before the instruments for teachers, and headmaster and parents.

At the same time, arrangements were made to administer the questionnaire to the Standard VI teachers and the headmaster. During the period, a time schedule for classroom observation was prepared by the headmaster. A total of fifteen classroom observations were made. The observations included sample lessons of Tamil (Comprehension and Composition), Bahasa Malaysia

(Comprehension and Composition), English and Mathematics.

The sample of 32 parents representing low, medium and high achievers was interviewed in November, 1991. Since most of the parents were working, the interviews were conducted in the evenings and at night. Based on the discussion with the parents, the interview schedule was completed.

Following data collection, the information obtained was coded and entered into diskettes for analysis by the Statistical Package for the Social Sciences (SPSS) Programme .

3.8 Data Analysis

To answer the research questions indicated in Chapter 1, the data is analysed in the following ways:

(a) Descriptive statistics (frequency counts and percentages) pertaining to pupil, school and parental factors which influence academic achievement are compiled to facilitate the identification of the significant variables.

(b) Cross-tabulations and chi-square tests are carried out to determine the association between the independent variables (pupil, school and parental factors) and the dependent variable (academic achievement).

(c) Reflections (qualitative analysis) based on the classroom observations is undertaken to determine the impact of classroom instruction on academic achievement.

(d) Data from the interviews is used merely to report; the approach is basically descriptive.