

Chapter Two

Methodology

2.1 Introduction

The chapter on methodology describes the following, in detail. For the convenience of presentation of facts, the sub headings made use of are stated below:

- (a) Objectives of the study
- (b) Framework of the research study
- (c) Sample of students
- (d) Achievement tests used
- (e) Data collection process
- (f) Analysis of test data
- (g) Preparation of report
- (h) Limitations of the study

To identify the progress in achievement of students relative to the 2005 study when and where necessary, the differences in methodology adopted in 2008 is compared with the 2005 study.

2.2 Objectives of the Study

The overall objective of this project is in accordance with the Education Sector Development Framework and Programme (ESDFP). The development of the Education Plan through a Sector wide Approach refers to “promoting equity by enabling all children in the country to access and complete basic education.”

- 1.1 Assessing the achievement levels of students in First Language, Science and Technology and Mathematics completing Grade 08
- 1.2 Producing a National Report on the assessment of results.
- 1.3 Recommending strategies for the improvement in performance of students at National and Provincial levels.

2.3 Framework of the Research Study

The framework of the National Assessment of Achievement of Grade 08 students in year 2008 has been developed in three main stages. Initially, attention was on preparatory work. As the tools utilized for this study are the very same instruments used in year 2005, there was no need for construction of tests. It was only the printing of First Language, Mathematics and Science and Technology achievement tests. As there was no need to collect background information, preparation of other questionnaires was not necessary. The sampling methodology for the study was based on an instructional manual given by the World Bank at the work session held in Kuwait in year 2007 for evaluation purpose. It was designed by the statistical consultation group, statistics Canada in Ottawa (for details see appendix II) Drawing the sample for the 2008 study was different from the 2005 study. The Sample Design Manager programme developed by IIEP and supplied by World Bank during a work session held in Paris was used in 2005.

As is given in the Figure 2.1, the second stage of the framework includes data collection, through test administration, data entry and data cleaning. The tests were administered to a sample of 10,882 students selected from a sample of 364 schools. Secondly, data entry and marking the multiple choice questions were done utilizing computers. In language tests, some of the supply type and essay type test items were marked manually, according to a marking scheme developed at the time of test construction. Finally, data were cleaned.

At the third stage, the data was analyzed with view to identifying the patterns of performances of students. In this process the variables such as province, subject, school type, location, medium of instruction and curriculum content were analyzed. In the 2008 study, the province was taken as the explicit strata. As a result, in data analysis the district level patterns have not been discussed as was done in year 2005. Only the provincial level patterns are to be highlighted. The end product of this study is producing a National Report. Figure 2.1, gives the main features of the national study in the year 2008.

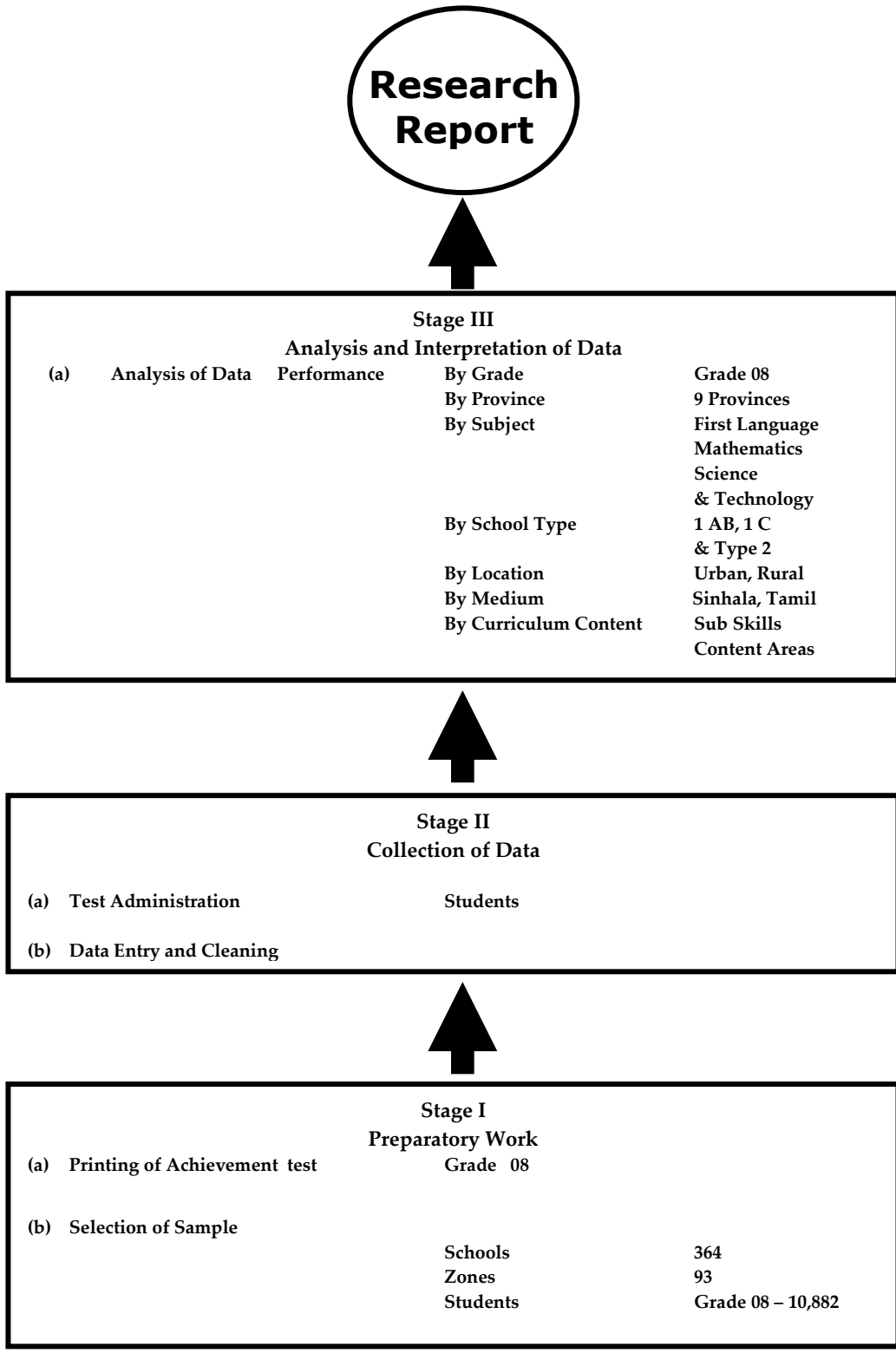


Figure 2.1: Main Features of the Framework of the National Study 2008

2.4 Sample

2.4.1 Sample of Students

The target population of the study was the students who studied in government schools and completed Grade 08 by the end of year 2007. For selection of the sample, the database facilities of the Ministry of Education (MOE) were used. In addition, this data base was used for the categorization of schools and students on the basis of province, district, zone, gender, medium of instruction, school type, urban (municipal councils and urban councils), rural (pradeshiya sabhas), number of Grade 08 classes and students in each school, etc.

An instructional manual given by the World Bank in 2007 for evaluation purposes was utilized for the present study. The sample achieved by using this manual is given in Table 2.1. The main features of the sampling methodology and the process of designing the sample is given in detail (see Appendix II).

Table 2.1 - Sample Achieved in Grade 08 National Assessment - 2008

Province	Allocated School Sample	Calculated school Sample	Achieved Student Sample
Western	40	1334	1247
Central	41	1207	1110
Southern	40	1215	1084
Northern	41	1150	1143
Eastern	40	1247	1221
North Western	40	1173	1124
North Central	41	1183	1043
Uva	40	1177	1052
Sabaragamuwa	41	1196	1217
Total	364	10882	10241

In the selection of sample the stratification variables such as sub population and strata (explicit and implicit) were taken in to consideration. As the explicit strata province and the implicit strata, medium of instruction (Sinhala and Tamil) and school type (1AB, 1C and Type 2) were used. (For details see Appendix II).

The Distribution of Sample among the nine provinces is given below in Figure 2.2

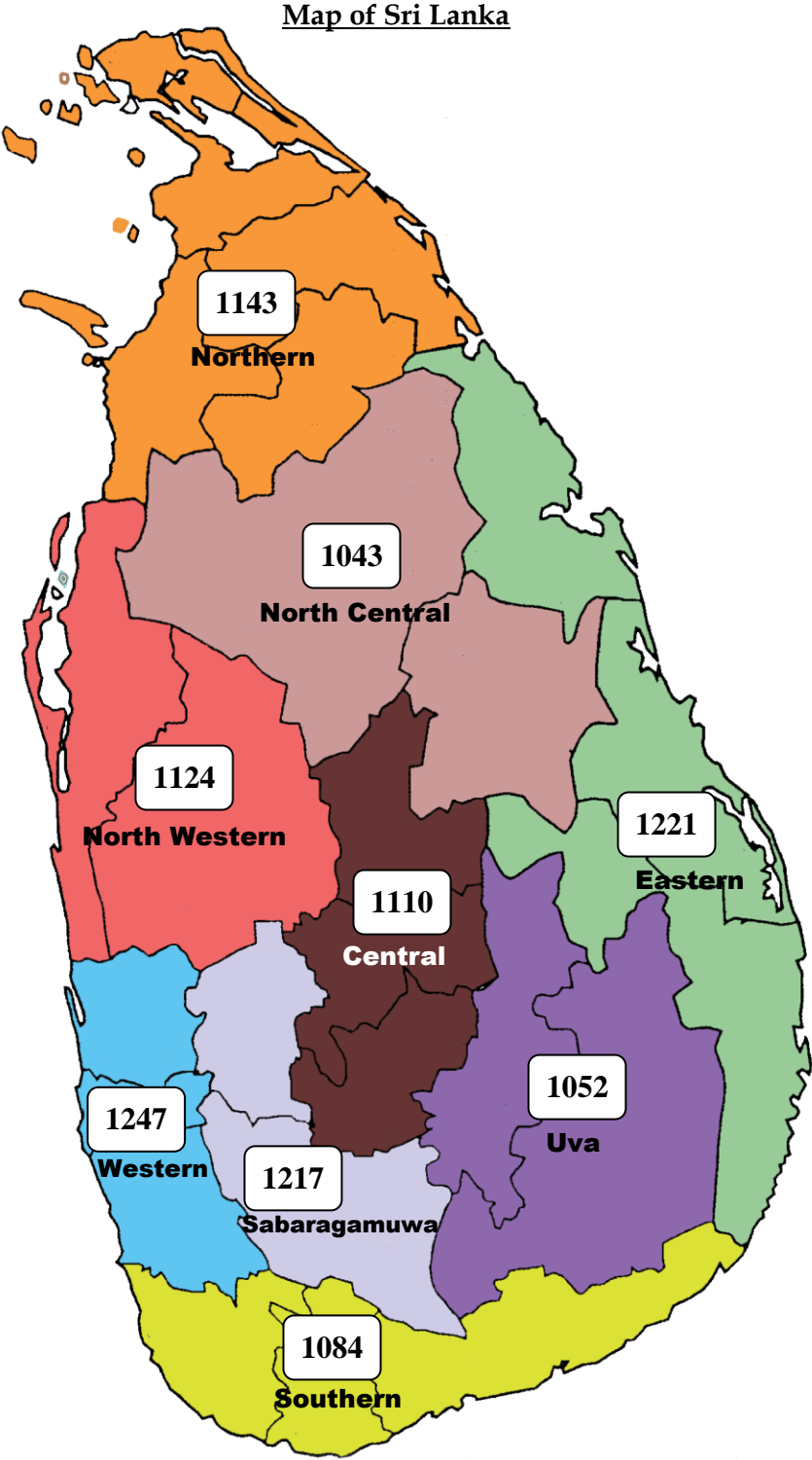


Figure 2.2: The Distribution of Sample Among the Nine Provinces

The distribution of the all-island sample by school type, location, gender and medium of instruction are shown in the following figures.

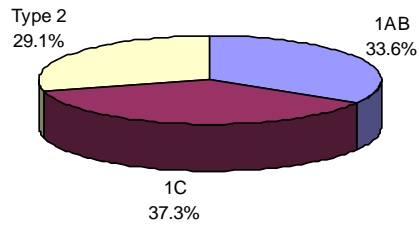


Figure 2.3: All Island Sample of Students by School Type

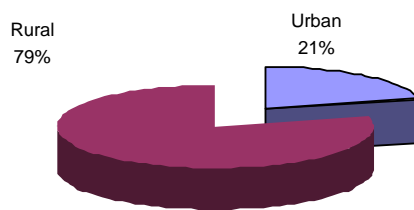


Figure 2.4: All Island Sample of Students by Location

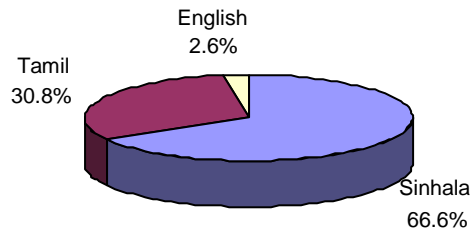


Figure 2.5: All Island Sample of Students by Medium of Instruction

Table 2.2 - Sample Achieved at Provincial Level by Gender

Province	Male	Female
Western	640	607
Central	631	479
Southern	435	649
Northern	551	592
Eastern	504	717
North Western	501	623
North Central	504	539
Uva	524	528
Sabaragamuwa	526	691
Total	4816	5425

2.5 Achievement Tests Used

The tests utilized in the year 2005 study were to measure the achievement levels of the students; the same tests utilized in the 2005 study were made use of in the 2008 study. Abilities tested in relation to the four subjects, First Language (Sinhala Language / Tamil Language), Mathematics and Science and Technology are given in Table 2.3 in detail.

Table 2.3 - Subjects and Abilities Tested in Grade 08

Subject	Abilities	No. of Questions
Sinhala Language	Vocabulary	16
	Comprehension	08
	Syntax	12
	Writing	09
	Appreciation	02
Tamil Language	Vocabulary	16
	Comprehension	08
	Syntax	12
	Writing	09
	Appreciation	02
Mathematics	Knowledge and Skills	16
	Communications	07
	Connections	08
	Reasoning	07
	Problem Solving	02
Science and Technology	Knowledge	08
	Comprehension	11
	Application	09
	Analysis	10
	Synthesis	02

The duration of all tests was of one hour. Multiple choice items with four options were used in Mathematics and Science and Technology tests. Multiple choice as well as essay type items were included in the two First Language tests, namely Sinhala Language and Tamil Language. The items of the test were selected from a large pool of pre tested items. The facility values of these items were in the range of 0.12 - 0.95. All the items were with discrimination and RPP values above 0.2. In arranging the items of the tests, they were rank ordered from the highest facility

value (0.95) to the lowest facility value (0.12). Tables of specifications were prepared in order to maintain the proper representation of subject content and the relevant abilities of the subjects tested. These steps assure the content validity of the tests. In the two language test papers, different types of test items other than multiple choice test items have been used to assess the writing abilities of the students, more accurately. All the tests were pre tested before finalizing, with view of establishing the reliability of the tests. It was found that all of the items possessed a value of above 80 in KR 20 reliability coefficient, as the same curriculum has been in use during both years 2005 and 2008, in Grade 08. Using the same test papers in both studies is therefore justifiable.

2.5.1 Data Collection Process

The test administration was done throughout the country on 05th July 2008. These tests were conducted from 9.00 a.m. to 12.15 p.m. on the assigned date, according to a fixed time table given by NEREC. To make the test administration process perfect and reliable, training programmes were held in two stages.

Stage I

Training of zonal education officers were held at NEREC from 16th up to 24th June 2008. All 93 zonal education officers were trained in 06 smaller groups at NEREC as they had to be given thorough instructions on the test administration process. In their training programme, the findings of the previous Grade 08 study and the significance of the present study, how the test results may be utilized by educational planners, curriculum developers and plan implementers, training the test administration personnel, maintaining the confidential nature of the test papers, conducting the test according to time table, were some of the facts highlighted.

Stage II

Training of supervisors, principals and other invigilators at 93 zonal education offices.

This training was done at each and every Zonal Education Office on July 02nd, 2008 with the leadership of the Zonal Education Directors who were appointed as the

coordinators in the zone in respect of the test administration task. All the Zonal Education Directors, Deputy Directors and Assistant Directors and the Principals were supplied with a detailed manual of instructions, in addition to the training given. The Zonal Education Director who served as the coordinating officer in conducting the test in the schools selected from his zone was responsible for taking the question paper from NEREC, distributing them among Deputy/Assistant Directors who served as supervisors, collecting answer scripts from supervisors and returning them to NEREC. As the test was held during a weekend, the chances of any undue influence from staff members and other students of the school could be contained satisfactorily. All these steps were taken to assure the confidential and reliable nature of data collection.

To ensure the proper administration of the test and check the nature of the happenings in the examination centers, the members of the research team visited several schools selected from different provinces during the time of the examination. A detailed manual of instructions were given to all Zonal Education Directors, Deputy/Assistant Directors and Principals so that uniformity in conducting the test throughout the island could be achieved. Any other problems which were faced by the Zonal Education Directors and the supervisors of the examinations were dealt with by the coordinator.

Marking Answer Scripts

All the multiple choice items of the tests were marked using computer. Few of the essay type answers given in the language tests were assessed using panel marking, under the supervision and guidance of an experienced Chief Examiner who was involved in designing the test paper and the marking scheme.

Data Entry and Data Cleaning

Data entry and cleaning were done at NEREC. Data entry and data cleaning was done under the supervision and guidance of the team members with the objective of maintaining the accuracy of data.

2.6 Data Analysis

Achievement test data was analyzed on a national as well as provincial basis. As the student sample was weighted to suit the provincial populations the analysis was carried out by provincial level. As necessary, comparisons of achievement level of Grade 08 students in 2005 and 2008 have been attempted. The improvement or decrease in achievement levels in the subjects tested has been reported on national and provincial levels. Distribution of the scores, nature of the frequency polygon, skewness of frequency polygon, mean values of the subjects, performance in sub skills, grading such as mastery, near mastery and non mastery are some of the indicators utilized in interpreting test scores.

Analysis of variance on differences among provinces and many other variables discussed in analysis of data are given in the report. As necessary confidence intervals and standard errors were are provided.

2.7 Preparation of Reports

A National Level research report has been produced in English and summary report will be produce in Sinhala and Tamil. Detailed information on the sample of schools, sampling process, analysis of variance and some of the indicators on provincial status are given as annexure in the report. Some of the key points are highlighted at the end of each chapter to make the report reader friendly.

2.8 Limitation of the Study

Though the achievement levels of the students in 2005 and 2008 have been compared, the methodologies used in selecting the sample of students during the two studies differ. In year 2005 Sampling Design Manager the package developed by IIEP Paris was utilized. In 2008 the instruction manual introduced by the World Bank in year 2007 at the training programme held in Kuwait was utilized. There are a few differences in the two approaches. SAMDEM considers 400 as the

effective sample size of students where as the new programme considers 178 as the effective sample size per province (see Appendix II).

2.9 Summary

The main objective of the study is to assess the achievement levels of students in First Language, Science and Technology and Mathematics completing Grade 08 by end of year 2007. Identifying the main patterns of learning achievements and comparing them with year 2005 findings is attempted. A sample of 10,882 students selected from 364 schools is utilized for this purpose and achieved sample 10241. For the selection of the student sample, the Instruction Manual introduced in the training programme held in Kuwait in year 2007 was utilized. Sinhala Language, Tamil Language, Mathematics and Science and Technology test papers that were used in 2005 study have been used in year 2008 as well. Administration of the test through out the country was done in July 2008. Data collectors were trained in two stages: first at NEREC and the other at zonal education offices. Finally, analysis of data is done to identify the patterns in achievement at national and provincial levels. Research reports are prepared in English, Sinhala and Tamil medium.

Key points

Methodology

Objectives of the Study

- to assess the achievement levels of students in First Language, Science and Technology and Mathematics completing Grade 08 by end of year 2007.

Sample

- 10,241 students selected from 364 schools.
- For the selection of the student sample, the Instruction Manual given by the world Bank in year 2007 was utilized.

Achievement Test

- Sinhala Language, Tamil Language, Mathematics and Science and Technology test papers of the 2005 study have been repeated.

Administration of the Test

- On 5th July 2008.

Data Entry and Analysis

- Analysis of data was done to identify the patterns in achievement at national as well as provincial levels

Research Reports

- Produced in English, Sinhala and Tamil medium.