

Chapter Three

Methodology

3.0 Scope

'National Assessment of Achievement of Grade 04 Pupils in Sri Lanka' is a national level research study carried out by the National Education Research and Evaluation Centre (NEREC), Faculty of Education, University of Colombo. The study is funded and guided by the World Bank and supported by the Teacher Education and Teacher Deployment (TETD) Project, Ministry of Human Resource Development, Education and Cultural Affairs. This research is primarily aimed at assessing the achievement levels of pupils who have completed four years of schooling in Sri Lankan schools.

The second dimension of the Education For All programme is "the Universal access to, and completion of primary education". "The improvement in learning achievement, such that an appropriate age cohort attains or surpasses a defined level of learning achievement" is the third dimension. The fifteenth indicator relating to the quantitative evaluation of a country's learning achievement level explained within the EFA declaration is the "percentage of pupils having reached at least Grade 04 of primary schooling, who master a set of nationally defined basic learning competencies." One of the main concerns of this study is to gather information relating to this indicator, on a national basis. Identifying provincial level status in order to design and develop a programme for monitoring learning achievement with the objective of improving the levels of achievement, is the ultimate target.

3.1 Objectives of the Study

The following are the objectives of the study

1. Construction and **standardization of tests** in First Language (Sinhala and Tamil) English (the Second Language) and Mathematics to be used at the end of Grade 04 in the Primary cycle.
2. Assessment of **achievement levels** of pupils completing the Key Stage Two in the Primary cycle.
3. Analysis of achievement on the basis of variables such as province, district, school type, location, gender etc.
4. Determination of the association of **factors related** to teachers, schools and parents, with pupil achievement.
5. Provision of **feedback information** to educational planners, curriculum developers and stakeholders.

3.2 The Sample of Students

The target population of the study were the 343,179 pupils, who studied in government schools and completed grade 04 by the end of year 2002. For selection of the sample, the database facilities of the Ministry of Education (MOE) were 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 04 classes and students in each school etc., the MOE data base was used.

The software package, Sampling Design Manager (SAMDEM) developed by the International Institute for Educational Planning (IIEP), Paris, was used for selection of the sample. This package developed under the leadership of Kenneth N. Ross, Programme Specialist at IIEP, provides a sample design that would provide a sound model for application in any country. It is understood that the programme designers have followed Peaker's six step approach in this task. This package utilises the "Probability Proportional to Size (PPS) Approach".

The sample design tables developed by IIEP were used to decide the composition of the sample. The following requirements were considered in decision making.

Table 3.1 - Requirements Considered in Sampling

Requirement	National Level	Provincial Level
roh value	0.5	0.5
Minimum cluster size	20	20
No. of Schools	(840) 846	94
No. of Students	16800	1880
Effective sample size	400	400

Accordingly, using the sample design tables prepared by IIEP, it was found that a sample of 16800 pupils, selected from 840 schools, with 20 students from each school was needed for the national sample; at the provincial level 1880 students selected from each province, representing 94 schools was needed.

Table 3.2 provides information on how the proportional sample across provinces were identified.

Table 3.2 - The Proportional Sample Across Provinces (Targeted)

Stratum		Defined			Allocation across strata				
N	Province	Std.	Schl.	Pct.	Schools			Measure of size	
					Exact	Planned	Option	Number	Pct.
1	Western	74060	1116	21.4%	45.0	45	94	1880	11.1%
2	Central	46066	1168	13.3%	28.0	28	94	1880	11.1%
3	Southern	45091	913	13.0%	27.4	27	94	1880	11.1%
4	North	24035	650	6.9%	14.6	15	94	1880	11.1%
5	East	33949	830	9.8%	20.6	21	94	1880	11.1%
6	North Western	39915	947	11.5%	24.2	24	94	1880	11.1%
7	North Central	23030	599	6.7%	14.0	14	94	1880	11.1%
8	Uva	26231	676	7.6%	15.9	16	94	1880	11.1%
9	Sabaragamuwa	33602	826	9.7%	20.4	20	94	1880	11.1%
Grand Total		345979	7725	100.0%	210.0	210	846	16920	100.0%

Table 3.3 provides information on the total population, sample targeted and sample achieved at national level.

Table 3.3 - The National Sample of Students

School Type	Total Population		Sample Targeted				Sample Achieved	
	Number	Percent	No. of Schools	Minimum Cluster Size	No. of Students	Percent	No. of Students	Percent
1AB	55103	16.1	136	20	2720	16	2672	15.8
IC	101614	29.6	250	20	5000	29.6	4910	29.0
2	116082	33.8	286	20	5720	33.8	5448	32.2
3	70380	20.5	174	20	3480	20.6	3353	19.8
Total	343179	100	846	20	16920	100	16383	96.8

A total number of **16383 students** were included in the sample. They were selected from **939 schools** that covered all the 09 provinces, the 25 districts as well as the 92 educational zones in the country. Though the minimum cluster size of students selected from each school was 20, in cases where a school did not have 20 students in the Grade 04 class, 02 schools were taken together and treated as a pseudo school. Schools that had less than 10 students in Grade 04 in year 2002 were not considered for inclusion in the sample.

Table 3.4 outlines how the national sample was achieved from the 09 provinces and the 25 districts.

Table 3.4 - Proportional Sample across strata (Achieved)

Province	No of Students	District	No. of Students
Western	1842	1. Colombo	730
		2. Gampaha	700
		3. Kalutara	412
Central	1816	4. Kandy	913
		5. Matale	330
		6. Nuwara-Eliya	573
Southern	1808	7. Galle	765
		8. Matara	571
		9. Hambantota	472
Northern	1857	10. Jaffna	793
		11. Kilinochchi	278
		12. Mannar	174
		13. Mulativu	292
		14. Vavuniya	320
Eastern	1814	15. Batticaloa	576
		16. Ampara	764
		17. Trincomalee	474
North Western	1820	18. Kurunegala	1146
		19. Puttalam	674
North Central	1828	20. Anuradhapura	1257
		21. Polonnaruwa	571
Uva	1805	22. Badulla	1154
		23. Moneragala	651
Sabaragamuwa	1793	24. Ratnapura	1079
		25. Kegalle	714
All Island Total	16383		16383

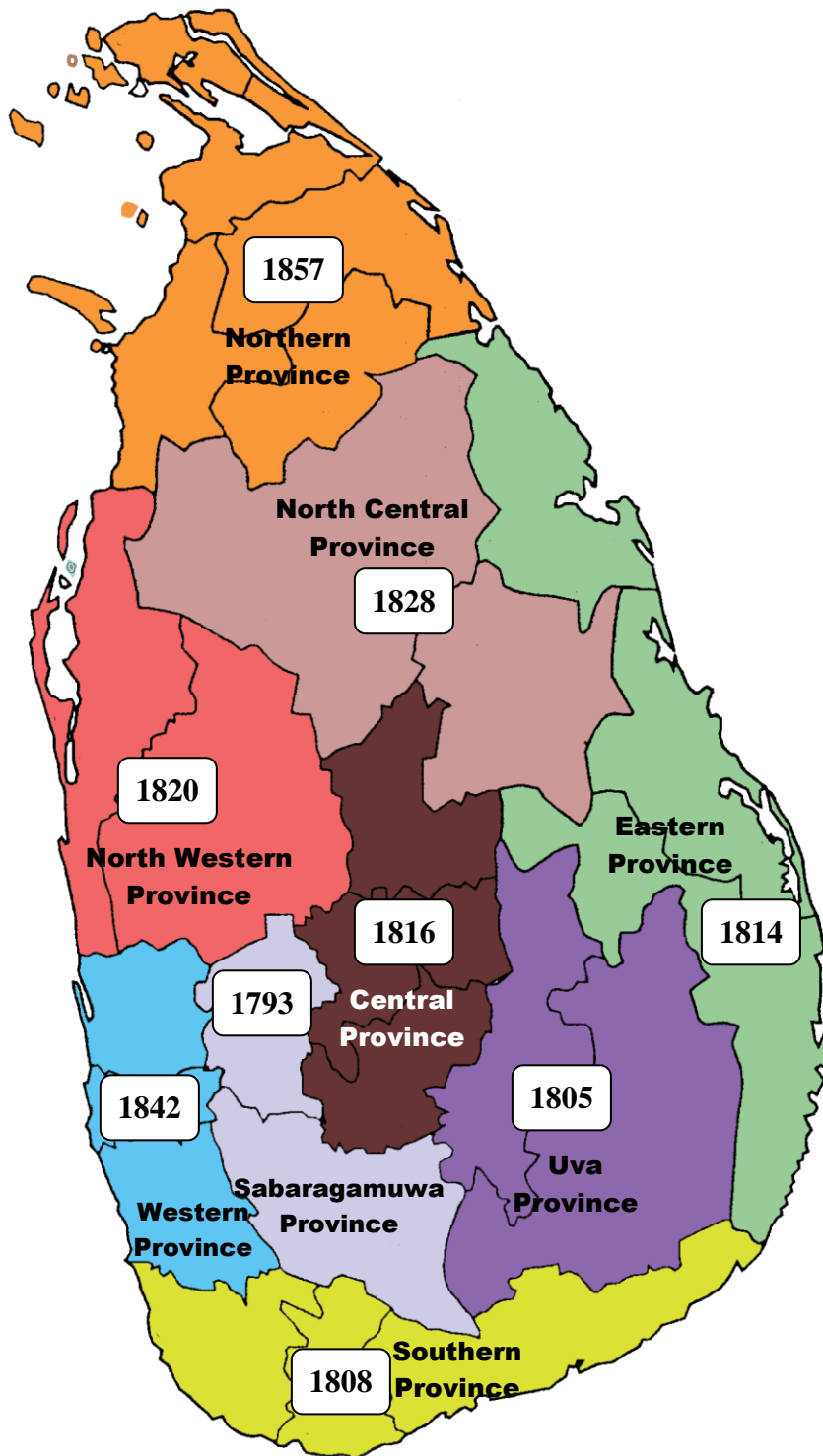


Figure 3.1 : Sample of Students- by Province

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

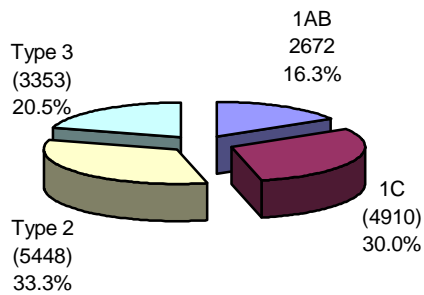


Figure 3.2: Sample of Students by School Types- All Island

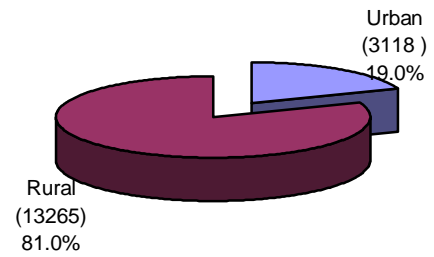


Figure 3.3 : Sample of Students by Location – All Island

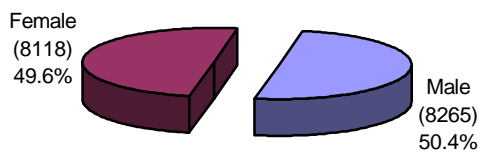


Figure 3.4 : Sample of Students by Gender - All Island

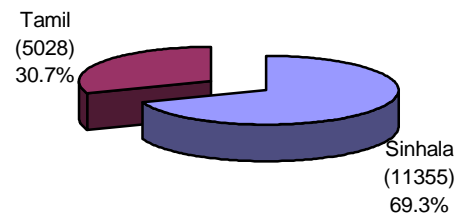


Figure 3.5 : Sample of Students by Medium of Instruction –All Island

3.3 Sample of Principals, Teachers and Parents

A total of 939 Principals, 939 Sectional Heads/Deputy Principals and 939 Class Teachers who were in-charge of Grade 04 classes in the year 2002 were included in the sample. The parent sample size was 16383.

Table 3.5 - Sample of Principals, Sectional Heads, Teachers and Parents

Province	Principals	Sectional Heads	Teachers	Parents
Western	98	98	98	1842
Central	107	107	107	1816
Southern	103	103	103	1808
Northern	107	107	107	1857
Eastern	102	102	102	1814
North Western	106	106	106	1820
North Central	106	106	106	1828
Uva	104	104	104	1805
Sabaragamuwa	106	106	106	1793
	939	939	939	16383

3.4 Achievement Tests

Achievement levels of the students were measured using written tests in the subjects First Language (Sinhala/Tamil), Mathematics and English Language. Table 3.6 provides an overview of the composition of the tests.

Table 3.6 - Nature of the Achievement Tests

Subject	Skills	No. of Questions	Duration
Sinhala Language	Vocabulary	10	45 minutes
	Comprehension	11	
	Syntax	10	
	Writing	9	
Tamil Language	Vocabulary	10	45 minutes
	Comprehension	11	
	Syntax	10	
	Writing	9	
English Language	Vocabulary	12	45 minutes
	Comprehension	15	
	Syntax	11	
	Writing	2	
Mathematics	Concepts	12	One hour
	Procedures	15	
	Problem solving	13	

Each test consisted of 40 questions. The Mathematics test included multiple choice questions with four options. In Sinhala, Tamil and English Language, test items such as multiple choice, joining (matching), completion and writing simple sentences were used to assess the language abilities of the students. These tests were constructed using pre-tested test items. The selected items had facility values ranging from 0.65 to 0.98. **As the tests were intended to measure the levels of mastery, items which had a Facility Value below 0.65 were not included.** Items to identify some of the essential learning

competencies that are expected to be achieved by Grade 04 students at the end of the Second Key Stage were also included in the tests. In arranging the test items it was attempted to begin with the easiest items (Facility Value 0.98) and proceed to the most difficult (Facility Value 0.65). The construct validity of the tests was maintained using tables of specifications. Face validity and efficiency of the tests were established through a second pre-test. All the tests possessed **KR 20 reliability values above 0.85**.

3.5 Other Instruments of Data Collection

Five questionnaires were constructed to collect background information that influenced learning achievement. One questionnaire was used for data collection on **student background** factors that influence learning. The parent questionnaire was designed to gather **home background** information. Principal, sectional head/deputy principal and teacher questionnaires were aimed at collecting information on various aspects of the **school and on classroom climate**.

Table 3.7 : The Composition of the Questionnaires

	Questionnaire	Sections	No of Questions
School Background	Principal	<ul style="list-style-type: none"> ▪ Background Information ▪ Teacher profile ▪ Facilities in the school ▪ Financial Status of the school ▪ Opinions 	37
	Sectional Head	<ul style="list-style-type: none"> ▪ Background Information ▪ Facilities in school ▪ Teaching-Learning-Assessment Procedures ▪ Monitoring ▪ Opinions 	13
	Class Teacher	<ul style="list-style-type: none"> ▪ Background Information ▪ Academic and Professional details ▪ Quantitative and Qualitative aspects of the classroom ▪ Opinions 	41
Home Background	Parents	<ul style="list-style-type: none"> ▪ Background Information ▪ Facilities at home ▪ Socio-Economic status ▪ Support in learning ▪ Opinions 	51
	Student	<ul style="list-style-type: none"> ▪ Background Information ▪ Pre-school Education ▪ Spending after school hours ▪ Opinion 	26

3.6 Execution of the Survey

The achievement tests were administered throughout the country on 08th March 2003. Collection of data on the socio-economic factors was completed within the next week from 9th – 15th March 2003. In order to achieve excellence in data collection, all the Zonal Education Officers, 92 Assistant Directors of Education, 939 Principals and 939 Teachers were employed in the activity. They were given necessary instructions and training at national level as well as at zonal level seminars.

3.7 Analysis of Data

Achievement test data was **analysed on a national as well as provincial basis**. When and where necessary district level analysis was also done to facilitate the identification of strengths and weaknesses. Background data was analysed to identify different factors influenced achievement. These findings may be very helpful in designing the future plans and activities at school, district, provincial and national levels.

3.8 Reports

A research report giving the **National Level position** has been produced. Nine **provincial level reports** that give sufficient information for provincial authorities have also been prepared. A **separate statistical report** that could be used in any further studies has been produced.

3.9 References

Ross, K.N. : (2002) *Sample Design for International Studies of Educational Achievement*. IIEP, Paris.

School Census : (2002) Statistical Data. Ministry of Education, Sri Lanka.

Statistical Choices for Education Reforms : (2002) IIEP, Paris.

World Declaration on Education for All and Framework for Action to Meet Basic Learning Needs : (1990) Inter Agency Commission for WCEFA, USA.