

National Report

National Assessment of Achievement of Students Completing Grade 8 in Year 2016 in Sri Lanka

**Ministry of Education
National Education Research and Evaluation Centre (NEREC)**

*Financed by:
World Bank-funded Transforming the School Education System as the Foundation of a
Knowledge Hub Project (TSEP)*

May 2017

© Ministry of Education, Sri Lanka and
National Education Research and Evaluation Centre (NEREC)
Faculty of Education, University of Colombo, Sri Lanka

ISBN 978-955-1187-28-6

First Published May 2017

Writer: Prof. Marie Perera

Sample Selection: Jude Nonis

Data Analysis: Jude Nonis

Proof Reading: N. Rupasinghe

Data Processing: Nyanie Gamaethige
Nadee Gamaethige
M.H.S.F. Mahsanie
K.M. Kanishka Karunanayake
Anuradha S. Seneviratne
Devinda Wijethunga
K.P. Ganga Udeshika
Varuni Gurugamage
Sandaru Jayawardhana

Acknowledgements

My sincere gratitude is extended to the following institutions and people who contributed to make the research study on “National Assessment of Achievement of Students Completing Grade 8 in Year 2016 in Sri Lanka” a success. If not for their support this study would not have been a reality.

- The Ministry of Education for commissioning the study to NEREC.
- Hon. Akila Viraj Kariyawasam, Minister of Education for providing guidance and support.
- Mr. Sunil Hettiarachchi, Secretary Ministry of Education for his cooperation during various stages of this study.
- Mr. S.U. Wijeratne, Additional Secretary (Policy, Planning and Performance Review), Dr.(Ms). Madura Wehella (Additional Secretary, Educational Quality Development) and Dr. Jayantha Balasuriya, (Acting Director, Policy and Planning) of the MOE Planning Division and Ms. Gayathri Abeygunasekara, Deputy Commissioner, Department of Examinations for their unstinted support in designing and launching the project.
- The World Bank for financing the study, Dr. Harsha Aturupana (Lead Education Specialist, World Bank), Ms. Mari Shojo (Education Specialist, World Bank) and Senior Professor Upul Sonnadara (University of Colombo- Consultant to the World Bank) for their guidance and suggestions to make this study a success, is highly appreciated.
- Senior Professor Lakshman Dissanayake, Vice Chancellor, University of Colombo for his cooperation and granting permission to implement the project.
- Professor W. Chandradasa, Former Dean, Faculty of Education, University of Colombo for his guidance and cooperation throughout the activities of the project.
- Professor Manjula Vithanapathirana, the Dean of the Faculty of Education, for her support for the successful completion of the study.
- I am also deeply indebted to all the other members of the research team, namely, Dr. M. Karunanithy, Mr. Jude Nonis, Ms. R.D.C. Niroshinie, Ms. Kumudu Seneviratne, and Ms. Jeevani Herath for their valuable contribution to the research study.

- Ms. Yogarane Shakhivel and Mr. S. Athirathan (Academic staff of the Faculty of Education) for assisting in supervising Tamil medium assessments.
- I also thank Mr. Ariyadasa Edirisinghe (former Commissioner of Examinations –Department of Examinations) for his assistance in administering the all island assessments.
- My gratitude also goes to all the examination coordinators, school coordinators all over the country who participated in test administration and all other professionals at provincial, zonal and school levels who contributed in numerous ways to carry out this study.
- Last but not least, the support extended by Ms. Nyanie Gamaethige (Office Manager - NEREC), Mr. K.M. Kanishka Karunanayake, Mr. Lokuvithana, and the other members of NEREC.
- The services provided by Research Management Unit of the University of Colombo and other various personnel who contributed to this study in many ways are also very much appreciated.

Senior Professor Marie Perera
Director
National Education Research and Evaluation Centre (NEREC)

Message from the Secretary, Ministry of Education

I consider it is a privilege for me to write this message to the report on 'National Assessment of Achievements of Grade 8 students in 2016 in Sri Lanka'. Conducting periodical national assessments has been one of the major activities of the Education Sector Development Framework and Programme (ESDFP) (2012-2016). This is an important national action which is exercised with a view to reveal in the achievement levels of students in various grades. Findings of these assessments help teachers to understand the levels of achievement of students and policy-makers and planners to determine the performance of the education system by means of learning outcomes, to what extent the educational development programmes and investments have been successful and what further steps should be taken in order further to upgrade the performance of the system considering the importance of this exercise, the Ministry of Education has planned to continue these assessments regularly and effectively.

In this context the Ministry of Education, with the financial assistance of the World Bank, has commissioned the National Education Research and Evaluation Center (NEREC) of the Faculty of Education, University of Colombo the task of conducting national assessments to determine the levels of achievements of students in grades 4 and 8, during last several years. Its latest national assessment report reveals factors that are particularly significant in order to enhance teaching and learning, analysed by various aspects such as types of schools, gender, medium of instruction, location, and competency levels of students who completed grade 8 in the year 2016.

I wish to extend my sincere gratitude to Hon. Akila Viraj Kariyawasam, Minister of Education for providing guidance to implement this activity which has a national importance. Further, I also wish to thank Dr. Harsha Aturupane, Lead Education Specialist, Education Global Practice of the World Bank for providing technical guidance to carry out this assessment and appreciate the financial assistance extended by the World Bank through the 'Transforming School Education Project (TSEP)' for this purpose. I also appreciate the Dean, Faculty of Education University of Colombo, and Director NEREC, Professor Marie Perera and NEREC research team

for their academic contributions, and time taken to conduct and complete this assessment on time. Finally, I thank Mr. S.U. Wijeratne, Additional Secretary, Policy, Planning and Performance Review Division and Dr.(Mrs.) Madura M. Wehella, Additional Secretary, Education Quality Development and Dr. Jayantha Balasooriya, Director of Education, Policy and Planning Branch of the Ministry of Education for their academic and technical contributions and coordination with NEREC and the World Bank in making this exercise a success.

Sunil Hettiarachchi
Secretary
Ministry of Education

Research Team

Marie Perera - Coordinator

M. Karunanithy

P.K. J.E. Nonis

Kumudu Seneviratne

Jeevani Herath

R.D.C. Niroshinie

Contents

Acknowledgements	iii
Message from the Secretary, Ministry of Education	v
Research Team	vii
Contents	viii
List of Tables	xii
List of Figures	xv
Abbreviations	xix
Executive Summary	xxi

Chapter 1 - Introduction to the Study

1.1	Background	1
1.2	National Assessment Studies conducted in Sri Lanka	3
1.3	Rationale for the present study	4
1.4	National Assessment of Learning Outcomes- 2014 and 2016	5
1.5	Summary	6

Chapter 2 - Methodology

2.1	Introduction	7
2.2	Objectives of the Study	7
2.2.1	Specific Objectives of the Study	7
2.3	Sampling Methodology	7
2.3.1	Target Population	8
2.3.2	Sampling Frame and Elements of the Sampling Frame	8
2.3.3	Sample Design – Procedure	9
2.4	Framework for the National Assessment	11
2.5	Achievement Tests	12
2.6	Procedures in Administration of the National Assessment 2016	12
2.6.1	Test Coordinators	12
2.6.2	Training Workshop for Coordinators	13
2.6.3	Return of Answer Scripts and Other Documents	13
2.7	Analysis of Data	14
2.8	Summary	14

Chapter 3 - Patterns and Trends in Achievement: Mathematics 2016

3.1	Introduction	17
3.2	Patterns of achievement at National Level	17
3.3	Provincial wise student achievement	20
3.4	Achievement levels by type of school	24
3.5	Achievement levels by gender	28
3.6	Achievement levels by medium of instruction	32
3.7	Achievement levels by location	35
3.8	Analysis of achievement by sub skills	38
3.9	Trends in achievement at national level	43
3.10	Provincial wise comparison of student achievement	44
3.11	Comparison of marks according to school type	47
3.12	Comparison of marks according to gender	48
3.13	Comparison of marks according to medium of instruction	49
3.14	Comparison of marks according to location	50
3.15	Comparison of students' achievement in relation to ELCs	51
3.16	Summary	54

Chapter 4 - Patterns and Trends in Achievement: Science 2016

4.1	Introduction	55
4.2	Patterns of achievement at National Level	55
4.3	Provincial wise student achievement	57
4.4	Achievement levels by type of school	62
4.5	Achievement levels by gender	66
4.6	Achievement levels by medium of instruction	69
4.7	Achievement levels by location	73
4.8	Analysis of achievement by sub skills	77
4.9	Trends in achievement at national level	82
4.10	Provincial wise comparison of student achievement	83
4.11	Comparison of marks according to school type	86
4.12	Comparison of marks according to gender	87
4.13	Comparison of marks according to medium of instruction	88
4.14	Comparison of marks according to location	89
4.15	Comparison of students' achievement in relation to ELCs	90
4.16	Summary	92

Chapter 5 - Patterns and Trends in Achievement: English Language 2016

5.1	Introduction	95
5.2	Patterns of achievement at National Level	95
5.3	Provincial wise student achievement	97
5.4	Achievement levels by type of school	102
5.5	Achievement levels by gender	106
5.6	Achievement levels by medium of instruction	110
5.7	Achievement levels by location	114
5.8	Analysis of achievement by sub skills	117
5.9	Trends in achievement at national level	120
5.10	Provincial wise comparison of student achievement	121
5.11	Comparison of marks according to school type	124
5.12	Comparison of marks according to gender	125
5.13	Comparison of marks according to medium of instruction	126
5.14	Comparison of marks according to location	127
5.15	Comparison of students' achievement in relation to ELCs	128
5.16	Summary	129

Chapter 6 - Conclusion and the Way Forward

6.1	Introduction	131
6.2	Patterns identified in the achievement of learning outcomes - 2016	131
6.2.1	All island performance	131
6.3	Disparity in achievement among the sub groups	132
6.3.1	Provincial wise performance	132
6.3.2	Achievement according to school types	133
6.3.3	Achievement according to gender	134
6.3.4	Achievement according to medium of instruction	134
6.3.5	Achievement according to location	134
6.4	Strengths and weaknesses in students' knowledge and skills	135
6.5	Trends in achievement 2014 -2016	135
6.5.1	National level trends	135
6.5.2	Provincial level trends	136

6.5.3	Trends according to School Types	136
6.5.4	Trends according to gender	136
6.5.5	Trends according to medium of instruction	137
6.5.6	Trends according to location of the school	137
6.6	What the findings reveal	137
6.7	The way forward	138
	References	141
	Series of National Assessments	143

List of Tables

Chapter 2

Table 2.1:	Target population	9
Table 2.2:	Calculated student sample and school sample per province	10
Table 2.3:	Calculated, allocated and achieved student sample per each province	11

Chapter 3

Table 3.1:	All island achievement in mathematics 2016- cumulative percentages	18
Table 3.2:	Provincial achievement in mathematics 2016 – Summary statistics	20
Table 3.3:	Percentage of students scoring 50 or above, and below 50 - Mathematics	23
Table 3.4:	Mathematics achievement according to school type	24
Table 3.5:	Cumulative student percentages according to school type- Mathematics	26
Table 3.6:	Mathematics achievement according to gender	28
Table 3.7:	Cumulative student percentages according to gender –Mathematics	30
Table 3.8:	Mathematics achievement according to medium of instruction	32
Table 3.9:	Cumulative student percentages according to medium of instruction – Mathematics	33
Table 3.10:	Mathematics achievement according to location	35
Table 3.11:	Cumulative student percentages according to the location – Mathematics	37
Table 3.12:	Achievement of competency levels related to knowledge and skills	39
Table 3.13:	Achievement of competency levels related to communication	40
Table 3.14 :	Achievement of competency levels related to relationships, reasoning and problem solving	42
Table 3.15:	Comparison of all island achievement in mathematics - cumulative percentages	43
Table 3.16:	Provincial wise comparison of student achievement – 2014 & 2016	45
Table 3.17:	Comparison of mathematics achievement according to school type	47
Table 3.18:	Comparison of mathematics achievement according to gender	48
Table 3.19:	Comparison of mathematics achievement according to medium of instruction	49
Table 3.20:	Comparison of mathematics achievement according to location	50
Table 3.21:	Comparison of achievement of competency levels related to knowledge and skills	51
Table 3.22:	Comparison of achievement of competency levels related communication	52

Table 3.23:	Comparison of achievement of competency levels related relationships, reasoning and problem solving	53
-------------	---	----

Chapter 4

Table 4.1:	All island achievement in science 2016– cumulative percentages	56
Table 4.2:	Provincial achievement in science 2016 – Summary statistics	58
Table 4.3:	Percentage of students scoring 50 or above, and below 50 - Science	61
Table 4.4:	Science achievement according to school type	62
Table 4.5:	Cumulative student percentages according to school type- Science	64
Table 4.6:	Science achievement according to gender	66
Table 4.7:	Cumulative student percentages according to the gender – Science	68
Table 4.8:	Science achievement according to medium of instruction	69
Table 4.9:	Cumulative student percentages according to medium of instruction – Science	71
Table 4.10:	Science achievement according to location	73
Table 4.11:	Cumulative student percentages according to the location – Science	75
Table 4.12:	Achievement of competency levels related to biology	77
Table 4.13:	Achievement of competency levels related to chemistry	78
Table 4.14:	Achievement of competency levels related to earth science	79
Table 4.15:	Achievement of competency levels related to physics	80
Table 4.16:	Comparison of all island achievement in science - cumulative percentages	82
Table 4.17:	Provincial wise comparison of student achievement – 2014 & 2016	84
Table 4.18:	Comparison of science achievement according to school type	86
Table 4.19:	Comparison of science achievement according to gender	87
Table 4.20:	Comparison of science achievement according to medium of instruction	88
Table 4.21:	Comparison of science achievement according to location	89
Table 4.22:	Comparison of achievement of competency levels related to biology	90
Table 4.23:	Comparison of achievement of competency levels related to chemistry	91
Table 4.24:	Comparison of achievement of competency levels related to earth science	91
Table 4.25:	Comparison of achievement of competency levels related to physics	92

Chapter 5

Table 5.1:	All island achievement in English 2016– cumulative percentages	96
Table 5.2:	Provincial achievement in English 2016 – Summary statistics	98
Table 5.3:	Percentage of students scoring 50 or above, and below 50 - English language	102
Table 5.4:	English language achievement according to school type	102
Table 5.5:	Cumulative student percentages according to school type- English language	105
Table 5.6:	English language achievement according to gender	106
Table 5.7:	Cumulative student percentages according to the gender – English language	108
Table 5.8:	English achievement according to medium of instruction	110
Table 5.9:	Cumulative student percentages according to medium of instruction – English language	112
Table 5.10:	English achievement according to location	114
Table 5.11:	Cumulative student percentages according to the location – English language	115
Table 5.12:	Achievement of competency levels - English language	117
Table 5.13:	Performance in writing a brief note	119
Table 5.14:	Performance in writing a guided short story	119
Table 5.15:	Comparison of all island achievement in English - cumulative percentages	120
Table 5.16:	Provincial wise comparison of student achievement – 2014 & 2016	122
Table 5.17:	Comparison of English Language achievement according to school type	124
Table 5.18:	Comparison of English Language achievement according to gender	125
Table 5.19:	Comparison of English Language achievement according to medium of instruction	126
Table 5.20:	Comparison of English language achievement according to location	127
Table 5.21:	Comparison of competency levels related to the English Language	128
Table 5.22:	Comparison of performance in writing a brief note	128
Table 5.23:	Comparison of performance in writing a guided short story	129

List of Figures

Chapter 3

Fig. 3.1:	All island achievement in mathematics 2016 – dispersion of marks	17
Fig. 3.2:	Box plot and whisker chart representing all island mathematics achievement	19
Fig. 3.3:	Bar chart to represent mean and median among the provinces - Mathematics	21
Fig. 3.4:	Provincial wise distribution of marks -mathematics	22
Fig. 3.5:	Box plot and whisker chart representing provincial wise mathematics achievement	23
Fig. 3.6:	Bar chart representing the mean and median among the school types- Mathematics	24
Fig. 3.7:	Dispersion of marks by school type – Mathematics	25
Fig. 3.8:	Mathematics marks according to school types using box plot and whisker plot	27
Fig. 3.9:	Bar chart representing mean and median values according to gender – Mathematics	28
Fig. 3.10:	Dispersion of marks by gender – Mathematics	29
Fig. 3.11:	Box plot and whisker plot representing gender wise mathematics marks	31
Fig. 3.12:	Bar chart representing mean and median values according to medium of instruction - Mathematics	32
Fig. 3.13:	Dispersion of marks by medium of instruction – Mathematics	33
Fig. 3.14:	Mathematics marks according to medium of instruction using box plot and whisker plot	34
Fig. 3.15:	Bar chart representing mean and median values according to location– Mathematics	36
Fig. 3.16:	Dispersion of marks by location – Mathematics	36
Fig. 3.17:	Box plot and whisker plot representing location wise mathematics marks	37
Fig. 3.18:	Achievement of competency levels related to knowledge and skills	40
Fig. 3.19:	Achievement of competency levels related to communication	41
Fig. 3.20:	Achievement of competency levels related to relationships, reasoning and problem solving	42

Fig. 3.21:	All island achievement in mathematics comparison 2014 -2016– dispersion of marks	43
Fig. 3.22:	Provincial wise comparison of student achievement - 2014 -2016	44
Fig. 3.23:	Comparison of provincial wise distribution of marks – Mathematics	46
Fig. 3.24:	All island comparison of mean values according to school type	47
Fig. 3.25:	All island comparison of mean values according to gender	48
Fig. 3.26:	All island comparison of mean values according medium of instruction	49
Fig. 3.27:	All island comparison of mean values according to location	50

Chapter 4

Fig. 4.1:	All island achievement in science 2016 – dispersion of marks	55
Fig. 4.2:	Box plot and whisker chart representing all island science achievement	57
Fig. 4.3:	Bar chart to represent mean and median among the provinces - Science	59
Fig. 4.4:	Provincial wise distribution of marks -science	60
Fig. 4.5:	Box plot and whisker chart representing provincial wise science achievement	61
Fig. 4.6:	Bar chart representing the mean and median values according to school types- Science	62
Fig. 4.7:	Dispersion of marks by school type – Science	63
Fig. 4.8:	Science marks according to school types using box plot and whisker plot	65
Fig. 4.9:	Bar chart representing mean and median values according to gender – Science	66
Fig. 4.10:	Dispersion of marks by gender – Science	67
Fig. 4.11:	Box plot and whisker plot representing gender wise science marks	69
Fig. 4.12:	Bar chart representing mean and median values according to medium of instruction - Science	70
Fig. 4.13:	Dispersion of marks by medium of instruction – Science	71
Fig. 4.14:	Science marks according to medium of instruction using box plot and whisker plot	72
Fig. 4.15:	Bar chart representing mean and median values according to location– Science	74
Fig. 4.16:	Dispersion of marks by location – Science	74

Fig. 4.17:	Box plot and whisker plot representing location wise science marks	76
Fig. 4.18:	Achievement of competency levels related to biology	78
Fig. 4.19:	Achievement of competency levels related to chemistry	79
Fig. 4.20:	Achievement of competency levels related to earth science	80
Fig. 4.21:	Achievement of competency levels related to physics	81
Fig. 4.22:	All island achievement in science comparison 2014 -2016– dispersion of marks	82
Fig. 4.23:	Provincial wise comparison of student achievement - 2014 -2016	83
Fig. 4.24:	Comparison of provincial wise distribution of marks – Science	85
Fig. 4.25:	All island comparison of mean values according to school type	86
Fig. 4.26:	All island comparison of mean values according to gender	87
Fig. 4.27:	All island comparison of mean values according medium of instruction	88
Fig. 4.28:	All island comparison of mean values according to location	89

Chapter 5

Fig. 5.1:	All island achievement in English 2016 – dispersion of marks	95
Fig. 5.2:	Box plot and whisker chart representing all island English achievement	97
Fig. 5.3:	Bar chart to represent mean and median among the provinces – English Language	99
Fig. 5.4:	Provincial wise distribution of marks –English Language	100
Fig. 5.5:	Box plot and whisker chart representing provincial wise English achievement	101
Fig. 5.6:	Bar chart representing the mean and median among the school types - English Language	103
Fig. 5.7:	Dispersion of marks by school type– English Language	104
Fig. 5.8:	English marks according to school types using box plot and whisker plot	105
Fig. 5.9:	Bar chart representing mean and median values according to gender – English	107
Fig. 5.10:	Dispersion of marks by gender – English	108
Fig. 5.11:	Box plot and whisker plot representing gender wise English Language marks	109

Fig. 5.12:	Bar chart representing mean and median values according to medium of instruction - English	110
Fig. 5.13:	Dispersion of marks by medium of instruction – English	111
Fig. 5.14:	English marks according to medium of instruction using box plot and whisker plot	113
Fig. 5.15:	Bar chart representing mean and median values according to location– English	114
Fig. 5.16:	Dispersion of marks by location – English	115
Fig. 5.17:	Box plot and whisker plot representing location wise English marks	116
Fig. 5.18:	Achievement of competency levels – English language	118
Fig. 5.19:	All island achievement in English comparison 2014 -2016– dispersion of marks	120
Fig. 5.20:	Provincial wise comparison of student achievement – 2014 & 2016	121
Fig. 5.21:	Comparison of provincial wise distribution of marks – English Language	123
Fig. 5.22:	All island comparison of mean values according to school type	124
Fig. 5.23:	All island comparison of mean values according to gender	125
Fig. 5.24:	All island comparison of mean values according medium of instruction	126
Fig. 5.25:	All island comparison of mean values according to location	127

Abbreviations

EFA	Education for All
ESDFP	Education Sector Development Framework and Programme
ESS	Effective Sample Size
IEA	International Association for the Evaluation of Educational Achievement
NEREC	National Education Research and Evaluation Centre
PPS	Probability Proportional to Size
roh	Rate of homogeneity
SD	Standard deviation
TIMSS	Trends in International Mathematics and Science Study

Executive Summary

Assessment of student learning has become a major tool of governments to collect high-quality data on education in order to inform effective policies and practices. In keeping with this trend in Sri Lanka the Ministry of Education has entrusted the National Education Research and Evaluation Centre (NEREC) of the Faculty of Education, University of Colombo to conduct these assessments.

NEREC has conducted National Assessment of Learning Outcomes both at primary as well as at secondary level. At secondary level National Assessment of learning outcomes were conducted at Grade 8 in 2005, 2008, 2012 and 2014. This report presents the findings of a National assessment conducted in grade 8 for English, mathematics and science in the year 2016.

The national assessment of learning outcomes of 2016 used instruments designed in 2012 to test cognitive skills in English, mathematics and science in keeping with the new competency based curriculum which was introduced in 2009 in grade 8. Same instruments were used in the 2014 national assessments. The findings of the 2016 assessment were compared with the findings of 2014.

The national assessment covered the entire country and the sample was drawn to enable analysis by province, type of schools, gender and medium of instruction. The sample consisted of 12,971 students drawn from 442 schools.

Patterns in learning achievement was discussed using measures of central tendency mean and median, skewness values of the distribution, cumulative percentages and percentile ranks. In addition, graphs – frequency polygon and box plots were also used

Data gathered through the achievement tests were analyzed on a national and provincial basis in relation to medium of instruction, school type, and gender.

The findings revealed that national averages of achievement for the three subjects mathematics, science and English in 2016 were 51.11, 41.76 and 35.81

respectively. Compared with the findings of 2014 it was found that in 2016, there is a slight increase in performance in all three subjects.

There is disparity in achievement in all three subjects in relation to provincial performance, school type, gender and medium of instruction. However, the comparison between the achievements in 2014 -2016 revealed that in science and English achievement male performance, in rural area and Tamil medium schools and 1C and Type 2 schools has increased. These findings implies that bridging the gap is possible, Therefore, is necessary to identify best practices that contributed to these increases and disseminate them to other schools.

It was also revealed that the competency based curriculum needs to be revisited. Achievement of majority of the competency levels in all three subjects is not satisfactory. However, when compared to 2014 in 2016 there is an improvement. Yet, the areas that were very weak continues to be weak and in some competency levels the achievement has decreased. Achievement of writing skills in English continues to be weak.

The National Institute of Education should examine whether these findings have been incorporated to the curriculum revisions in 2015. If not measures need to be taken to address these issues.

Dissemination of these findings at provincial and zonal level is recommended. It is necessary for the findings to be feed into future developmental plans. Therefore, it is necessary to carry out further small scale research, conduct workshops as to identify how best the findings could be utilized at grass root levels.