REPORT TO THE MINISTRY OF PRIMARY AND SECONDARY EDUCATION (MOPSE)

From

The Zimbabwe School Examinations Council (ZIMSEC)

Funded by

THE UNITED NATIONS CHILDREN'S FUND – (UNICEF ZIMBABWE)

An Evaluation Report of the 2017 Zimbabwe Early Learning Assessment (ZELA) Cycle

ABSTRACT

The Zimbabwe Education Development Fund (EDF) program was a four-year project undertaken by the United Nations Children's Fund (UNICEF). The EDF program provided essential material resources and support for the systems and structures designed to increase access to quality education for all Zimbabwean children. The EDF gave special attention to the most vulnerable children.

The Zimbabwe Early Learning Assessment (ZELA) project was aimed at improving Zimbabwe's system of pupil learning assessment. This was done by introducing an early-grades learning assessment to determine whether the EDF program (2010-2015) has achieved its goals in producing positive outcomes for children, their care-givers, schools, and the education sector in general. In 2012, the tools developed for ZELA provided a means of monitoring and evaluating the EDF program across the programme's life cycle. The key measure is the extent of improvement in learner learning outcomes. The extent of this improvement is measured in scores on tests of language and Mathematics in the early years of schooling.

The baseline study developed a measure of learner performance in language and Mathematics. Information was also collected during ZELA via learner and school head questionnaires in order to develop an understanding of learners' education backgrounds and learning outcomes. Data gathered from the questionnaires included learner background characteristics, the availability of teaching resources, and the level of funding and facilities.

UNICEF contracted the Australian Council for Educational Research (ACER) to undertake a baseline study in 2011, in collaboration with ZIMSEC. After the baseline study was completed in 2012, ACER was contracted to undertake two monitoring cycles (2013 and 2014) and an impact evaluation (2015), in collaboration with ZIMSEC. After the expiry of ACER contract, a decision was made to continue the ZELA programme with the Ministry of Primary and Secondary Education (MoPSE) playing a coordinating role and

ZIMSEC conducting the day to day activities of the program. A local consultant (Mr. Munyaradzi Damson) was hired to provide technical support to the MoPSE and ZIMSEC to ensure quality assurance of aspects of the 2016 and 2017 ZELA and support multivariate analysis.

This report was prepared by Mr. M. Damson, Miss A. Muropa, Dr. T. Chiwiye, Mr. F. Chirume, Mrs. G. Charumbira, Mr. B. Solomon, Mr. F. Mwale, Mr. K.Manokore, Mr. T. Kupfumira and Mr. J. Juru. In the build up to this report, several workshops on data management were conducted by Mr. M. Damson as part of ZELA Capacity Building activities. Topics included data cleaning and formatting, Item Response Theory (IRT), creation of plausible values, creation of weights, sampling for ZELA 2018, data analysis and report writing. ZIMSEC staff and the consultant conducted the analyses included in this report. These tasks included calculating the mean performance of population subgroups and determining if differences between subgroups or assessment years are statistically significant; developing graphs and tables; creating proficiency levels and calculating the percentage of learners within each level and analysing learner performance against learner and school characteristics and the calculation of the 2016-2017 shift based on 2016-2017 link items.

ACRONYMS AND ABBREVIATIONS

ACER	Australian Council for Educational Research
BEGE	Basic Education and Gender Equality
ECD	Early Childhood Development
EDF	Education Development Fund
ETF	Education Transition Fund
IRT	Item response theory
MDG	Millennium Development Goal
MoPSE	Ministry of Primary and Secondary Education
OECD	Organisation for Economic Co-operation and Development
PISA	Programme for International Student Assessment
PSU	Primary Sampling Units
SACMEQ	Southern Africa Consortium for Monitoring Educational Quality
SDG	Sustainable Development Goal
SES	Socio-Economic Status
SPSS	Statistical Product and Service Solutions
SSU	Secondary Sampling Units
TMO	Test Monitoring Officers
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNICEF	United Nations Children's Fund
ZELA	Zimbabwe Early Learning Assessment
ZIMSEC	Zimbabwe School Examinations Council
ZIMSTAT	Zimbabwe National Statistics Agency

EXECUTIVE SUMMARY

The Zimbabwe Early Learning Assessment (ZELA) program was a four-year project commissioned by the United Nations Children's Fund (UNICEF) to support and enhance national capacity to carry-out national assessment at early grades in Zimbabwe. The program also established a baseline for determining whether the EDF program (2010 - 2015) had the desired effects on children, their care-givers, schools, and the education sector in general, as well as to identify the extent to which changes are attributable to the EDF program interventions.

In 2010 as part of the EDF, UNICEF and its partners supplied all Zimbabwean primary schools with resources aimed at attaining quality education and access for all. The intervention included the provision of textbooks (English, Mathematics, Shona, Ndebele and Environmental Science) and the establishment of supporting resources related to the use of these books in schools. After the completion of the impact evaluation by ACER in 2015, it was decided that ZELA must proceed with MoPSE and ZIMSEC in charge. MoPSE and ZIMSEC rode on the systems and structures set by ACER. A local consultant was engaged to provide technical support.

This report relates to ZELA 2017 monitoring cycle built on the baseline data collected in 2012 for the evaluation of the EDF program. The major research questions for this monitoring cycle are:

1. How do the Zimbabwe learners perform in the language and Mathematics tests? Is there a noticeable pattern of change over time?
2. What are the relationships of the following groups of variables with performance on tests of languages and Mathematics at the beginning of Grade three in Zimbabwe?
    a) Learner background characteristics
    b) Teachers and teaching resources
    c) School funding and facilities

3. To what extent can improvement in test performance be attributed to the Education Development Fund?

Sample and Data Collection

The target population was learners in Grade 3 in Zimbabwe. A representative sample was drawn which yielded approximately 16500 learners in approximately 500 schools across the 10 provinces of Zimbabwe. Five sets of ZELA tests were set and administered to measure literacy (English and either Ndebele or Shona or Tonga) and numeracy (Mathematics). Home and school background information was collected through a Learner Questionnaire, which contained 20 questions and a School Head Questionnaire, which contained 39 questions respectively.

ZELA Tests

A single scale was developed to align the abilities of learners and difficulties of the items was constructed for each ZELA test after test-by-test analyses. For each subject scale, the distribution of learner abilities in ZELA 2017 was transformed to a scale with a mean of 300 and a standard deviation of 25. Link items from the 2016 and 2017 tests were used in the analysis to ensure that 2016-2017 test results were comparable.

Key findings

1. How do the Zimbabwe learners perform in the language and Mathematics tests? Is there a noticeable pattern of change over time?

The study explored how Zimbabwe learners performed in assessments of languages and Mathematics over time. The overall mean English performance increased by 0.36 per cent between 2016 and 2017, whilst Mathematics performance decreased by 1.39 percent over the same period. These changes in both English and Mathematics were statistically significant. Although the results for Mathematics performance show a significant decrease between 2016 and 2017, they indicate a significant improvement in learner’s performance between 2012 and 2017. English performance also indicates significant improvement in learner's performance between 2016 and 2017. Over time, both English and Mathematics exhibit a significant improvement between 2012 and 2017.

The 2012 baseline study found that for English, 49 per cent of Grade 3 learners were achieving at or above the grade level benchmark and that for Mathematics, 46 per cent of learners were achieving at or above the grade appropriate level. In 2015, 53 per cent of Grade 3 learners were performing at or above the grade level benchmark in English, and that for Mathematics, 66 per cent of learners were achieving at or above the grade appropriate level. In 2016, 71 per cent of Grade 3 learners were performing at or above the grade level benchmark in English, and that for Mathematics, 65 per cent of learners were achieving at or above the grade appropriate level. In 2017, 68 per cent of Grade 3 learners were performing at or above the grade level benchmark in English, and that for Mathematics, 55 per cent of learners were achieving at or above the grade appropriate level.

2. Relationships of learner, teaching and school characteristics with performance on tests of language and Mathematics at the beginning of grade three in Zimbabwe.

The research explored the relationships of learner, teaching and school variables with performance on tests of language and Mathematics at the beginning of Grade 3 in Zimbabwe. Analysis by gender showed that girls outperformed boys in both English and Mathematics in 2017. As has been the case for the previous ZELA cycles, the 2017 results indicated that learners from urban schools outperformed learners from rural schools. In 2017, the difference in mean performance between learners from urban and rural schools was 35.23 score points in English and 23.19 score points in Mathematics. We also observed a significant decrease in Mathematics performance for rural schools from 2016 to 2017.

Analysis by age group showed significant increases in both English and Mathematics performance between 2012 and 2017 for all age groups. Between 2016 and 2017, learners aged 7, 10, 11 and 12 years recorded significant increase in English performance. Only learners aged 9 recorded a significant decrease in English performance. For Mathematics, only learners aged 7 years increased significantly in their performance. Further analysis revealed the existence of a strong relationship between learner's performance and their socio-economic status (SES). The 2017 results have shown a significant increase in the mean performance of learners in all classes of socio economic status between 2016 and 2017 in English. However, only learners in the High SES class increased significantly in Mathematics between 2016 and 2017. There has been a significant increase in mean performance in both English and Mathematics between 2012 to 2017.

Analysis by province revealed that Bulawayo and Harare learners outperformed learners from all other provinces in both English and Mathematics in 2017. The results also show that learners who speak English at home outperformed those who speak Shona, Ndebele and Other languages at home in both English and Mathematics. However, there were no significant differences in both English and Mathematics performance between learners who speak Shona and Ndebele at home in 2017.

There are notable performance variations associated to the number of hours that learners spend working for their families. The 2017 English results indicate that those who work less than one hour per day outperformed all the other groups. However, there was no significant difference in English performance between learners who work 1 hour and more but less than 2 hours and those who work 2 hours and more but less than 3 hours. For Mathematics, the results showed no significant difference among the four groups. Learners who had three or more meals per day outperformed those with two meals who in-turn outperformed those who take one meal per day. The difference in performance between learners with three or more meals and those with two meals and the difference between those with two meals and one meal were statistically significant in both English and Mathematics. This trend was similar to that of 2012 and 2017.

Learners who had four or more home possessions outperformed those with two or three, who in-turn outperformed those with one or less home possessions. The differences in learner performance among all the groups were statistically significant in both English and Mathematics. The 2017 results also show that 79.1% of learners with four or more home possessions performed at or above grade level in English, while 68% and 63.8% of learners with two or three and those with one or less respectively performed at or above grade level. In Mathematics 69%, 55.7% and 49.9% of learners with four or more, two or three and one or less home possessions respectively performed at or above grade level.

In 2017, learners who had four or more home educational resources outperformed those with two or three and those with one or less in both English and Mathematics. However, there was no significant difference between learners with two or three and those with one or less home educational resources in English and Mathematics. In addition, the 2017 English and Mathematics results showed that learners with a parent or guardian who completed a tertiary course outperformed those with a parent who completed secondary education who in-turn outperformed learners with a parent or guardian who completed primary education. Furthermore, learners with a parent or guardian who completed primary education outperformed those with a parent who did not go to school.

Prior to 2017, school budget was found to predict performance significantly. However, in 2017 result from multiple regression show that school budget did not predict learners' performance significantly. Learners who were never absent in the term the assessment was administered, outperformed those who were absent for one or two days who in-turn outperformed learners who were absent for three or more days in both English and Mathematics. In English, the performance increases between the groups were statistically significant. However, performance in Mathematics showed significant decreases among all the three groups in 2017. In both English and Mathematics, all groups showed a significant increase in performances between 2012 and 2017.

3. To what extent can improvement in test performance be attributed to the Education Transition Fund (ETF)?

The results from the multiple regression analysis revealed that possible changes in location (urban versus rural) only accounted for 22% of the amount of variation in English performance. Addition of socio-economic variables (number of home possessions, number of meals per day, highest parental education and home educational resources) to the model increased the variation explained to 25%. Two background variables (gender and the number of hours working for the family per day) were then added to the model and the amount of variation in English explained by all these variables increased to 27%. Finally, teaching and learning variables (number of satellite schools, the budget per learner, the number of days a learner was absent and the number of reading materials) were added to the model and the total amount of variation in English performance explained was 30%. The fact that all these variables explained only 30% of the increase in English performance in 2017, imply that 70% of the increase is explained by other factors. A plausible factor is the distribution of textbooks and resources under the ETF.

In Mathematics, the location variables, socio-economic variables, background variables and teaching and learning variable cumulatively explain 19% of the amount of variation in Mathematics performance. This also suggests that 81% of the Mathematics performance could be explained by ETF textbooks.

TABLE OF CONTENTS

CHAPTER 1
EDUCATION DEVELOPMENT FUND AND CONTEXT OF THE ZELA PROGRAM

1.1 Introduction

The term assessment, in its widest meaning, denotes a process of collecting and interpreting information about learning and achievement of learners (Saklofske and Janzen, 1990). This assessment which is an integral part of teaching and learning provides information to students and their parents about the progress in acquiring knowledge, skills and attitudes. It also provides support to teachers to modify their instruction and the learning activities of their students. Most importantly, assessments provide information to various stakeholders that make decisions about educational policy related to learners and this is the primary focus of Zimbabwe Early Learning Assessment (ZELA).

1.2 Background to the study

After gaining independence in 1980, Zimbabwe expanded access to primary school education. This resulted in the number of primary school enrolments more than doubling in seven years. By 1982, primary school enrolment rates were reported at almost 100% (Nyanguru and Peil, 1991). However, the deterioration of the country's economy beginning in 2000 had serious negative impacts on the delivery of education services (Government of Zimbabwe, 2009). A high unemployment rate and hyperinflation peaked in Zimbabwe in 2008. This created an unstable environment that led to the loss of substantial investments in education and an exodus of skilled workers, including teachers (Kwenda and Ntuli, 2014). UNICEF (2009) reported that between 2008 and 2009, school attendance fell from 80% to 20%. It was also estimated that only about 40% of the country's teachers were attending lessons (UNICEF, 2008).

The sector slowly began to recover in 2009, with education taken as a priority in the new government's Short Term Emergency Recovery Programme (Government of Zimbabwe, 2009). By 2012, international education data indicated increases in enrolments and improvements in the education system. The UNESCO Institute for Statistics (UIS) reported a total net enrolment rate of 93.9% in primary education (UNESCO, 2015b). While enrolment and teacher numbers have recovered from 2008-2009, there continued to be significant achievement lags in the education system (UNICEF, 2013). Given the high variation in learner achievement in rural and urban areas and funding for programmes that support children with disabilities, there was therefore need to focus on resolving systemic equity issues (UNICEF, 2014).

After all these considerations and in line with the Basic Education and Gender Equality (BEGE)'s key focus within UNICEFs Medium-Term Strategic Plan, educational resources were given to primary schools in Zimbabwe. The focus was in line with UNICEFs contribution to the Sustainable Development Goals (SDGs) number four. After educational resources were given to schools, the ZELA program was instituted as a four-year program to monitor and evaluate the impact of educational resources which were given to schools across the country through the then Education Transition Fund (ETF). In 2012, the Australian Council for Educational Research (ACER) was engaged and a ZELA baseline study was carried out to determine change in learner performance from 2012-2015; to explore the relationships of learner, teacher and school-level variables on learner learning outcomes; and to explore the extent to which tests performance can be attributed to the EDF educational resources. Also one of the terms of reference of the ZELA programme was to support and enhance national capacity in student assessment through capacity building in areas to do with test development, data analysis and report writing.

After conducting four cycles of ZELA, the contract of ACER expired and a decision was made to continue with ZELA with the Ministry of Primary and Secondary Education (MoPSE) coordinating the activities in collaboration with the Zimbabwe School Examinations Council (ZIMSEC). To that end, a local consultant was also engaged to offer technical support to MoPSE and ZIMSEC. For 2017, the same model and structures which were set up by ACER were adopted in totality to allow for comparability of 2017 results to previous years. The 2016 and 2017 ZELA cycle was transformed from a research project to a sample-based National Assessment at grade 3 level testing grade two and below content. ZELA 2016 is conceptualised as the first cycle of the Zimbabwe Early Learning National Assessment.

1.2.1 Scope of the study

The 2017 Zimbabwe Early Learning National Assessment sought to answer the following questions:

a) How do the Zimbabwe learners perform in the language and Mathematics tests? Closely related to this is the question: Is there a noticeable pattern of change over time?

b) What are the relationships of the following groups of variables with performance on tests of language and Mathematics at the beginning of Grade 3 in Zimbabwe?

- Learner background characteristics
- Teacher and teaching resources
- School funding and facilities

c) To what extent can improvement in test performance be attributed to the Education Development Fund?

Other sub-questions which were pursued as a follow up to the above-mentioned question were as follows:

i. How do early-grade Zimbabwe learners perform in tests of language and Mathematics?

ii. Is it possible to identify learner-level and school-level variables that influence test performance?

Following the same structure that was set by ACER, MoPSE and ZIMSEC did the following in order to answer these questions:

This reported rode on the already reviewed literature on international experience in national assessment with particular emphasis on the Africa context contained in the 2012 baseline study. This was done in order to ensure that the project worked with the latest and best information for implementing the project.

A representative sample of Grade 3 learners from schools across the 10 provinces of Zimbabwe was drawn in 2017 based on the model developed by ACER. The sample was structured as; the first choice schools were the ***s***, then the first replacement schools were r_1 and in rare cases second choice schools for replacement r_2 were used. This sampling strategy allowed the study to generalise to the population of all Grade 3 learners in Zimbabwe.

Tests of Mathematics, English, SiNdebele, ChiTonga and ChiShona were developed and administered. Security procedures surrounding test development, printing, administration and marking were developed and implemented. Learner and School Head Questionnaires were developed by MoPSE and administered. This was designed to collect information about learner background, school and teachers. A manual for school administrators and for grade 3 teachers were developed as advance information to ensure the tests were administered consistently and appropriately. Test administrators and Test Monitors (TMO) were trained to ensure that they fully understood test protocols and the reasons for them. TMOs were important for ensuring that the quality of the data was protected at key stages during their collection and processing.

Training manuals were developed and published for test administrators and TMOs. These manuals provided guidelines for quality assurance practices as well as being the basis for their feedback to ZIMSEC on the conduct of the tests. Visits to schools by ZIMSEC and MoPSE officials were conducted as part of the quality assurance for the study. Procedures were designed for data capture that is, moving the information from the completed test forms and questionnaires to an electronic format. Data entry was done by ZIMSEC and data cleaning was done by ZIMSEC with support from the consultant.
Data analysis and report writing was done by ZIMSEC with support from the Consultant.

Students were sampled from registered and satellite schools. Satellite schools are not registered schools but are attached to a registered school referred to as a 'mother' school. Questionnaires were distributed to learners and to heads of schools (or their representatives) during the ZELA administration. These questionnaires are included in Appendices 2 and 3 of this report. Learner questionnaires were designed to collect contextual information while head of school questionnaires were designed to gather information on school-level variables. Questionnaires were printed in English, but teachers were allowed to assist students in their local language and in filling out the questionnaire, if necessary.

1.2.2 The implementation of the study over time

The progression of cohorts of learners being surveyed is summarised in Table 1.1 The number in parenthesis refers to the order of the test cycles over the duration of the evaluation. This report addresses the 2017 cycle. 2017 is the second cycle of ZELA conceptualised as sample-based national assessment.

Table 1.1: Location of the 2017 cycle within the wider evaluation

2010	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
EGLALN	1st cycle	2nd cycle	3rd cycle	4th cycle	1st cycle	2nd cycle
NA	Sample-based Baseline	Sample-based Monitoring	Sample-based Monitoring	Sample-based Evaluation	Sample-based National Assessment	Sample-based National Assessment

1.3 Literature Review

A significant number of researchers have offered a wide range of perspectives and advice pertaining to the issues of early learning assessment and how to integrate these elements into their practices. Research by (UNESCO, 2015a) indicates that there is improved preparation of children for primary education especially in the development of basic skills such as reading, writing, numeracy and language learning. The main purpose of linking early childhood development and primary education is to ensure that there is a smooth transition for children from one level of learning to another. Bukaliya and Mubika (2012) indicated that toddlers were more competent than those who went straight into Grade 1 without having gone through Early Childhood Development (ECD). Their results indicate that children's positive attitudes toward school are reinforced; they feel competent and their teachers identify them as competent and treat them as such. Zimbabwe's education system has registered significant progress in terms of quality and participation between 2012 and 2015, with pass rates at the pre-primary, primary and secondary level all showing a steady upward trend over the past four years (UNICEF, 2015).

According to UNESCO (2007), the academic performance of boys and girls globally is moving towards convergence. In the sub-Saharan region challenges regarding gender differences in learning outcomes remain. These vary by country, grade and subject. Out of the southern and eastern African countries that participated in Southern Africa Consortium for Monitoring Educational Quality II (SACMEQ II), Seychelles faces the greatest challenges with gender differences favouring girls in all school subjects. In language subjects, Botswana, Burkina Faso, Madagascar, Mali, Seychelles and South Africa are among those countries with the largest gender differences in learning outcomes, often favouring girls. In Mathematics,

Burkina Faso, Chad, Kenya, Mali, Niger, Senegal, Seychelles and the United Republic of Tanzania are among those with the largest gender differences, often favouring boys.
Equity remains a big challenge in Africa (Sharpe, 2007). Large disparities in access to education exist between children from different socio-economic backgrounds, between children living in different locations and between boys and girls. Children born into poorer households, especially in rural areas, are exceedingly unlikely to reach or progress in secondary school, no matter their aptitude for learning. In Mozambique, for instance, girls are much less likely to attend school than boys. In Angola the secondary enrolment rate in urban areas is more than six times higher than in rural areas and fewer than one child in ten aged 12 to 18 years from the poorest households are in secondary school.

According to Donald and Sondergaard (2008), most girls throughout Uganda continue to face more obstacles in completing a quality basic education than their male counterparts. Some learners who live in rural areas attend schools where there are teacher shortages and inadequate teaching resources and that can be a barrier to learning. In the United Republic of Tanzania, where average performance in Mathematics is better than elsewhere in southern and eastern Africa, only 25% of poor children living in rural areas are in school and learning, compared with 63% of rich children living in urban areas (UNESCO, 2015a). In Angola, Malawi and Zimbabwe prolonged drought and reduced rainfall caused a major food crisis, putting millions of people at risk. As a result, the education system is burdened by large classes, teacher shortages, inadequate school supplies and damaged infrastructure. In addition, the food crisis affecting the entire Sahel-region caused some 50,000 children in the most exposed areas in Niger to temporarily quit school.

1.4 Methodological Framework

The overall framework for the ZELA study is an adaptation of the input-process-output (3P) model of learning and teaching developed by Biggs (1993). This model portrays learning as an interactive system that examines three points in time where learning takes place. These points include:

i. The point before learning takes place (presage)
ii. The process of learning
iii. The outcome of learning

The model for data in the learner learning environment is represented in Figure 1.1. The framework portrays learning as an interactive system, identifying three points of time at which learning-related factors are placed: presage, before learning takes place; process, during learning; and product, the outcome of learning (Biggs, 1993).

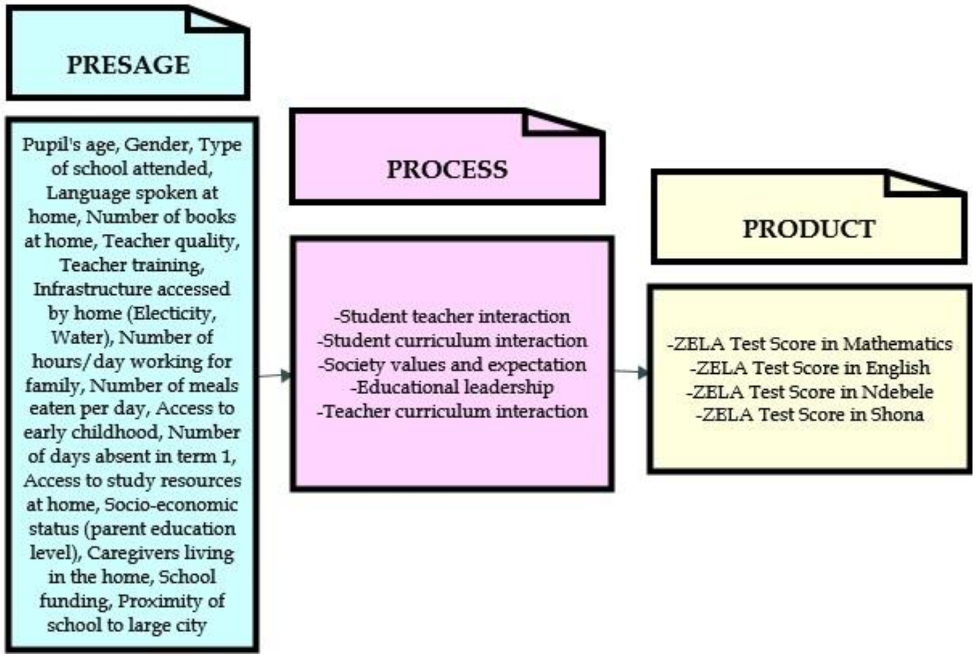

Figure 1.1: The 3P Model of Teaching and Learning (Biggs, 1985)

Biggs' model draws attention to two sets of presage factors: meta-contextual factors and those factors specific to the learner. In the adaptation of this model to datasets, the presage components are data about learners, teachers, and school organisation and resourcing. The Biggs model provides a structure to analyse influences upon learning opportunities where the purpose is to promote collaborative working; and as such, critical analysis of possibilities for better-targeted management of educational process (Biggs, 1993). This model is capable of generating predictions and associations that are relevant to this study and potential policy implications. Reading from top to bottom, from input through process to output, the diagram portrays the storyline for an individual learner or learner cohort.

Figure 1.1 provides an organisational framework to locate the data used in the ZELA research. The Background section of this report outlined the context of education in Zimbabwe. ZELA has gathered data about funding, facilities and resources, teacher quality and teacher training, and learner backgrounds. Table 1.2 lists the data that were gathered as input for the input-process-output model described in Figure 1.1

Table 1.2: Datasets - input for ZELA

Learner level (background characteristics)	**Teacher level (teacher quality & training)**	**School level (Funding & facilities)**
Type of school attended	No. of teachers	Province
Age	Qualification of teachers	School type
Gender	Professional development (teachers)	District
Language spoken at home	Teacher absentee rate	Language of instruction in early years
No. of books in the home	Professional development attendance	Years of operation
Infrastructure accessed at home	Qualification of Head teacher	Proximity to a large city
No. of hours working for family		Student population - enrolled
No. of meals eaten per day		Grade 3 learner population-enrolled
Access to ECD class		Average class size
No. of days absent in term 1		Minutes per lesson
Access to resources to study at home		Sessions per day
Socio-economic status (parents)		No. of days of closure of school operations
Religion		School infrastructure

Learner level (background characteristics)	Teacher level (teacher quality & training)	School level (Funding & facilities)
Caregivers living in the home		WASH Facilities Orphans and vulnerable children (%) Funding Learners with chairs (%) Textbook Supply Textbook use Students in fee arrears (%) No. of students with disability School days lost (caring responsibility) Head Teacher professional development

1.5 Sample and Data Collection

A representative sample based on the first choice schools *s* from the 2015 sample was used. The sample yielded approximately 16500 learners in 500 primary schools across the 10 provinces of Zimbabwe. The target population was learners in term 1 of Grade 3. Students were sampled from registered and satellite schools. While Zimbabwe's land reform program has been implemented in phases since independence in 1980, there was a large increase in the number of satellite schools after the fast track phase of the land reform program in 2000 for children whose parents migrated to those areas (Mutema, 2014). Satellite schools are constructed through community and Government partnership (Munjanganja and Machwira, 2014). Satellite schools were established rapidly in order to provide access to children whose families had moved to redistributed farms. Registered schools are formally recognised by government as meeting nationally approved standards. These standards were established by Zimbabwe's Ministry of Education and Culture in 1991 and remain as the key reference for school registration in 2015. A school can only become registered when it has established the following: "one administration block and toilets; a minimum of seven classrooms; a minimum of five teachers' houses; adequate toilet facilities as prescribed by official regulations; and a source of clean, portable water" (Ministry of Education and Culture, 1991). Satellite schools are formally attached to a registered school commonly referred to as a mother school. Satellite schools do not meet infrastructure and maintenance standards as defined by MoPSE (Munjanganja and Machwira, 2014).

Data collection included both cognitive and questionnaire instruments. Four ZELA tests were administered in English, Mathematics, Ndebele and Shona over two days. A single scale aligning the abilities of learners with the difficulties of the items was constructed for each ZELA test (namely English, Ndebele, Shona and Mathematics) after thorough test-by-test analyses. For each scale (English, Ndebele, Shona and Mathematics), the distribution abilities in ZELA 2012 was transformed to a scale with a mean of 300 and a standard deviation of 25. Link items from the 2012, 2013, 2014, 2015 and 2016 tests were used in the 2016 tests to ensure the 2012-2017 test results were comparable.

ZELA used Item Response Theory (IRT) scaling methodology for creating proficiency scales for all subjects along which student performance was measured. The scales were divided into proficiency levels to report what students typically know and can do to each level. More technical details about the scaling process are included in the ZELA 2016 Technical report. ZELA reports general results for the population of Grade 3 students, rather than results of individuals. The main statistics in this report include average performance of groups of grade 3 learners and percentages of learners within grade levels (proficiency levels). Standard errors are used and reported to evaluate if differences between those averages or percentages are statistically significant. More information on interpreting statistical results included in this report is presented in the next section.

1.5.1 Interpreting reported statistics

Statistical significance, standard errors and effect sizes

When reporting and interpreting results the notion of statistical significance is essential. All reported statistics are estimated for the full population of Grade 3 learners in Zimbabwe. Not all, but only a selection of Grade 3 learners was tested to provide these estimates. Testing all learners would be too expensive and inefficient for the purpose of the survey. Basing population estimates on a sample of learners causes uncertainty in the estimates. Large samples that represent the population will result in smaller uncertainties than small samples.

In a similar way, it is not possible to assess learners' achievement with test items that cover all possible skills within a domain. Only a representative set of items is used to test learners' performance in English and Mathematics. If a different set of items had been chosen, learners' performance would be slightly different, again leading to slightly different population estimates.

These two sources of uncertainty, the sampling of learners and selection of items in a test, are expressed as standard errors. These standard errors are taken into account when mean performance or percentages at or above grade levels are compared across time or between groups of learners. Differences in mean scores or percentage could be caused by real differences in the population or by chance due to the two sources of uncertainties. Standard errors tell us the likelihood that the differences are just caused by chance due to sampling of students and selection of test items. The usual acceptable level of uncertainty in reporting significant results that are actually just caused by chance is five per cent. If the likelihood is more than five per cent, it is concluded that the two means or percentages do not differ from each other. If the likelihood is less than five percent, it is concluded that the two means or percentages are (significantly) different from each other. Throughout the report, standard errors are included in the tables and presented between brackets.

In other words, even two values that look different from each other are regarded as not different if we are five percent or more uncertain that this difference was caused by real differences in the population. Apparent differences are only interpreted as differenced if they are statistically significant from each other; that is, if we are less than five per cent certain that the difference was caused by chance. Consider, for example, a hypothetical case where the average performance of girls is 324 and the average performance of boys is 322. While the mathematical difference is equal to score points, it is in a statistical sense equal to zero (no difference) if we are more than five per cent certain that this difference was caused by chance. In this case the conclusion would be that there is no difference in performance between girls and boys. Only if we are less than five per cent of this it is concluded that girls perform better than boys. In summary;

a statistically significant difference = a difference
a statistically non-significant difference = no difference

If differences are significant, the size of the difference can be described by diving the difference by the standard deviation (25 score points). Effect sizes between 0.1 and 0.3 are labelled in this report as small, between 0.3 and 0.5 as moderate, greater than 0.5 as large and greater than 1 as very large.

Nature of reported relationships

Most of the analyses conducted for this report involved comparisons of average achievement scores between groups of learners, for example, the difference in performance between learners in urban and rural areas. Whenever such a difference was statistically significant, it was concluded that the group variable was related to performance. However, this does not mean the relationship was necessary casual. That is, living in urban areas does not necessarily help students learn. This is because the relationship could be explained by other variables that were not taken into account when doing the comparison. For example, it is possible that a difference in socio-economic status explained the difference in performance between urban and rural areas, or to other student background or school characteristics. Hence, when describing these relationships, no direction of the effects was assumed.

The end of the report describes a multivariate model which includes several important learner background and school characteristics. In such a model, the net effect is tested of each individual predictor while controlling for - or taking into account - differences in other predictors. If the predictors are carefully chosen, such a model allows for cautious interpretation of the direction of the effects; cautious, because it is not possible to take all other (measured and unmeasured) factors into account. For example, it was found that learners in schools that are further removed from the district centre performed on average less well than learners in schools closer to the district centre. Of course, this effect is confounded with the effect of living in urban or rural areas and could also be explained by differences in family socio-economic status. Including all three variables in one model would show the net effect of each of the three variables, while taking differences in the other variables into account. If the effect of the distance to the district centre is in the other two controlling for urban and rural locations and for socio-economic status, it can be concluded that additional factors, in excess of urban versus rural locations and family socio-economic status, negatively affect student performance in remote areas.

1.6 Questionnaires

Questionnaires were distributed to learners and to heads of schools (or their representative) during the annual ZELA administration. Learner questionnaires were designed to collect family background information while head of school questionnaires were designed to gather information on school context. Questionnaires were printed in English, but teachers were allowed to assist students in their local language and in filling out the questionnaire, if necessary. Information guides were developed and dispatched to District Education Officers (DEOs), school heads, teachers and parents.

For the purpose of comparability, participation in a national research program required standardization of the assessment procedure across all schools. For this reason, a Directions for Administration manual was developed and used to train test administrators regarding the specific details of the two-day administration of all questionnaires and tests. In addition, Test Monitoring Officers (TMOs) were trained to observe the test administration process in a random selection of 30 schools. The TMOs submitted reports on their field observations.

Test administrators adhered to strict security protocols. Test and questionnaire responses were returned to ZIMSEC and the Ministry of Primary and Secondary Education (MoPSE) district and provincial offices. Both completed and non-completed instruments were couriered to a central location in Zimbabwe where test forms and questionnaires were manually entered into an electronic format for analysis. Data analysis and report writing was conducted by ZIMSEC and ACER.

1.7 Limitation of the study

Learners that were selected for the English and Mathematics assessments could choose to respond to the Shona or Ndebele language tests, but schools were not obliged to have students take the tests. The consequence of this self-selecting process is that the samples for Shona and Ndebele languages were not comparable across the assessment years. Therefore, trends are not reported for achievement in Shona and Ndebele.

1.8 Structure of the report

This report is divided into several chapters and these are organised as follows:

Chapter 1 - The Education Development Fund and Context of the ZELA program: This chapter introduces the ZELA programme, the background of the educational context in Zimbabwe and the problem statement.

Chapter 2 - Performance in Languages and Mathematics overall and by learner demographics and family background variables: Chapter two is focused on the performance in languages and Mathematics overall and by learner demographics and family background variables. The chapter describes trends in performance of Grade three learners in English and Mathematics from 2012 to 2016.

Chapter 3 - Socio-Economic Equity in Education in Zimbabwe: In the context of socio-economic equity, this chapter explores how Zimbabwe is providing education opportunities and achieving educational outcomes, which are an indication of equity in society as a whole.

Chapter 4 - Performance in English and Mathematics within the Zimbabwe Educational Context: Chapter four describes relationships found in the full population between learner performance, characteristics of the school and learning environment.

Chapter 5 - Conclusion, Policy implications and Future programming:
Chapter five presents the Conclusion, Policy implications and Future programming.

CHAPTER 2
PERFORMANCE IN LANGUAGES AND MATHEMATICS OVERALL & BY LEARNER DEMOGRAPHICS & FAMILY BACKGROUND VARIABLES

2.1 Introduction

This chapter presents the results of the ZELA 2017 analysis and makes comparisons to 2016 and 2017. Firstly, it describes the sample descriptives and secondly the trends in performance of grade 3 learners in English and Mathematics in Zimbabwe. This is achieved by analysing differences in performance between demographic and family background such as location, province, age, language spoken at home, time per day working for the family, meals per day, number of home possessions, number of home educational resources and highest parental education. Furthermore, the chapter presents the ZELA 2017 scale for English and Mathematics showing the proportion of learners below grade level, at grade level and above grade level.

2.2 Sample Characteristics

Learners that were selected for the English and Mathematics assessments could choose to respond to either Ndebele, Shona or Tonga tests, but were not obliged to. As a result, these three language tests were not comparable across the assessment years. Therefore, trends are not reported for achievement in Ndebele, Shona and Tonga; however, some results for 2017 are presented at the end of this chapter. In total 16500 learners were assessed from 500 primary schools in Zimbabwe. The results in this chapter are reported overall and by learner demographic and family background variables.

Population descriptives based on the full samples from 2012, 2015, 2016 and 2017 are included in Table 2.1 and Table 2.2. As shown in Table 2.1, urban schools constituted 29% of the sample in 2016 as compared to 13% in 2017. The decrease in the number of urban schools was as a result of the stratified random sampling with proportional allocation technique used in the 2017 sample selection. This resulted in 87% of the sampled schools being rural schools. Stratified random sampling with proportional allocation technique was used because of its ability to reduce selection bias by adequately representing the diversity in performance of the learners in each stratum. Furthermore, this technique enabled us to sample even the smallest and most inaccessible subgroups in the population. This meant that provinces with high school population were allocated high sample sizes within the provinces. For example, Manicaland province had the highest population of schools (873) as compared to Bulawayo with the lowest population of 133 schools and therefore were allocated 16% and 2% in the sample respectively.

Midlands and Manicaland provinces had the highest contribution in the 2017 sample. Table 2.1 shows that Midlands and Manicaland each had 16% of the sampled schools in the 2017 sample while Harare and Bulawayo had the lowest of 5% and 2% respectively. In terms of age, Table 2.1 shows that 48% of the learners who took the 2017 ZELA test were age 9 years. This was an increase from 39% in 2016. There was also notable decreases in the number of learners aged 8 and 10 years between 2016 and 2017, while the other age groups remained fairly stable over the same period.

The percentage of learners having 3 or more meals per day in 2017 was 54%, those having two meals per day were 36% and 10% had one meal per day. These results are similar to those obtained in 2016. Table 2.2 shows an increase in the number of learners who speak Shona at home. The was a slight decrease in the learners who speak Ndebele at home while the other languages spoken at home remained stable between 2016 and 2017. The percentage of learners who worked 1 or more hours but less than 2 hours a day decreased from 36% in 2016 to 30% in 2017, while the other categories did not change significantly over the same period.

Number of home possessions, number of educational resources and the highest parental education are believed to influence learner performance. Descriptive statistics in Table 2.2 show that the percentage of learners with two home possessions (electricity, piped water, television, borehole and radio) increased from 24% in 2016 to 30% in 2017. There were no major changes among learners who had none, two, three and four home possessions between 2016 and 2017.

The educational resources that were under study are pencil, school bag, pen, desk, computer and calculator. In 2012, 2016 and 2017, the majority of the learners (39%, 38% and 34% respectively) had one educational resource. In 2017, the majority of the learners (35%) had three of the cited educational resources. For the highest parental education, Table 2.2 shows that there has not been much difference between 2016 and 2017 on categories, *did not go to school, did primary education* and *did tertiary education*. However, the percentage of learners with parents who completed secondary school increased from 56% in 2016 to 68% in 2017.

Table 2.1: Sample descriptives in 2012, 2015, 2016 and 2017

Variable	Options	2012	2015	2016	2017
Gender	Boys	50%	50%	50%	50%
	Girls	50%	50%	50 %	50%
Location	Urban	20%	22%	29%	13%
	Rural	80%	78%	71%	87%
Province	Bulawayo	4%	4%	11%	2%
	Harare	9%	10%	12%	5%
	Manicaland	15%	16%	10%	16%
	Mashonaland Central	10%	10%	10%	10%
	Mashonaland East	11%	11%	9%	13%
	Mashonaland West	12%	11%	9%	13%
	Masvingo	13%	14%	9%	8%
	Matabeleland North	7%	7%	10%	9%
	Matabeleland South	6%	5%	10%	8%
	Midlands	13%	13%	10%	16%
Age (in years)	Aged below 7	1%	2%	0%	0%
	Aged 7	13%	13%	2%	1%
	Aged 8	39%	37%	22%	19%
	Aged 9	28%	27%	39%	48%
	Aged 10	12%	12%	25%	19%
	Aged 11	5%	4%	7%	7%
	Aged 12	2%	2%	3%	3%

	Aged 13	0%	2%	1%	2%
	Aged 14 and above	0%	1%	1%	1%
Meals per day	1 meal	11%	10%	9%	10%
	2 meals	31%	33%	37%	36%
	3 or more meals	58%	57%	54%	54%

Table 2.2: Sample descriptives in 2012, 2015, 2016 and 2017

Variable	**Option**	**2012**	**2015**	**2016**	**2017**
Language spoken at home	Shona	67%	73%	68%	73%
	Ndebele	14%	14%	20%	16%
	English	2%	4%	3%	3%
	Other	17%	9%	9%	8%
Time spend working for family	Less than 1 hour a day	33%	33%	32%	32%
	1 or more but less than 2 hours a day	26%	27%	36%	30%
	2 or more but less than 3 hours a day	19%	19%	16%	18%
	3 hours or more a day	21%	20%	16%	20%
Number of home possessions	Zero	12%	3%	7%	6%
	One	29%	35%	28%	31%
	Two	23%	24%	24%	30%
	Three	18%	20%	22%	19%
	Four or more	18%	17%	19%	14%
Number of educational resources	Zero	3%	1%	0%	1%
	One	39%	38%	17%	19%
	Two	23%	22%	21%	19%

	Three	14%	16%	28%	35%
	Four to six	12%	20%	34%	26%
Highest parental education	Did not go to school	3%	3%	3%	3%
	Did primary education	16%	16%	15%	13%
	Did secondary education	71%	60%	56%	68%
	Did a tertiary course	10%	21%	19%	16%

2.3 Item response theory

In Item response theory, student achievement is not directly measurable or observable by a single question such as a person's height or gender. Instead, tests are used to measure such unobservable attributes and a measurement scale needs to be constructed. Item response theory methodology is used to create such a scale. The responses of learners to the test items are used to place both the learners' achievements and the item difficulties on the same measurement scale. The English and Mathematics scales that were constructed for ZELA 2017 are presented in Figure 2.1 and Figure 2.2.

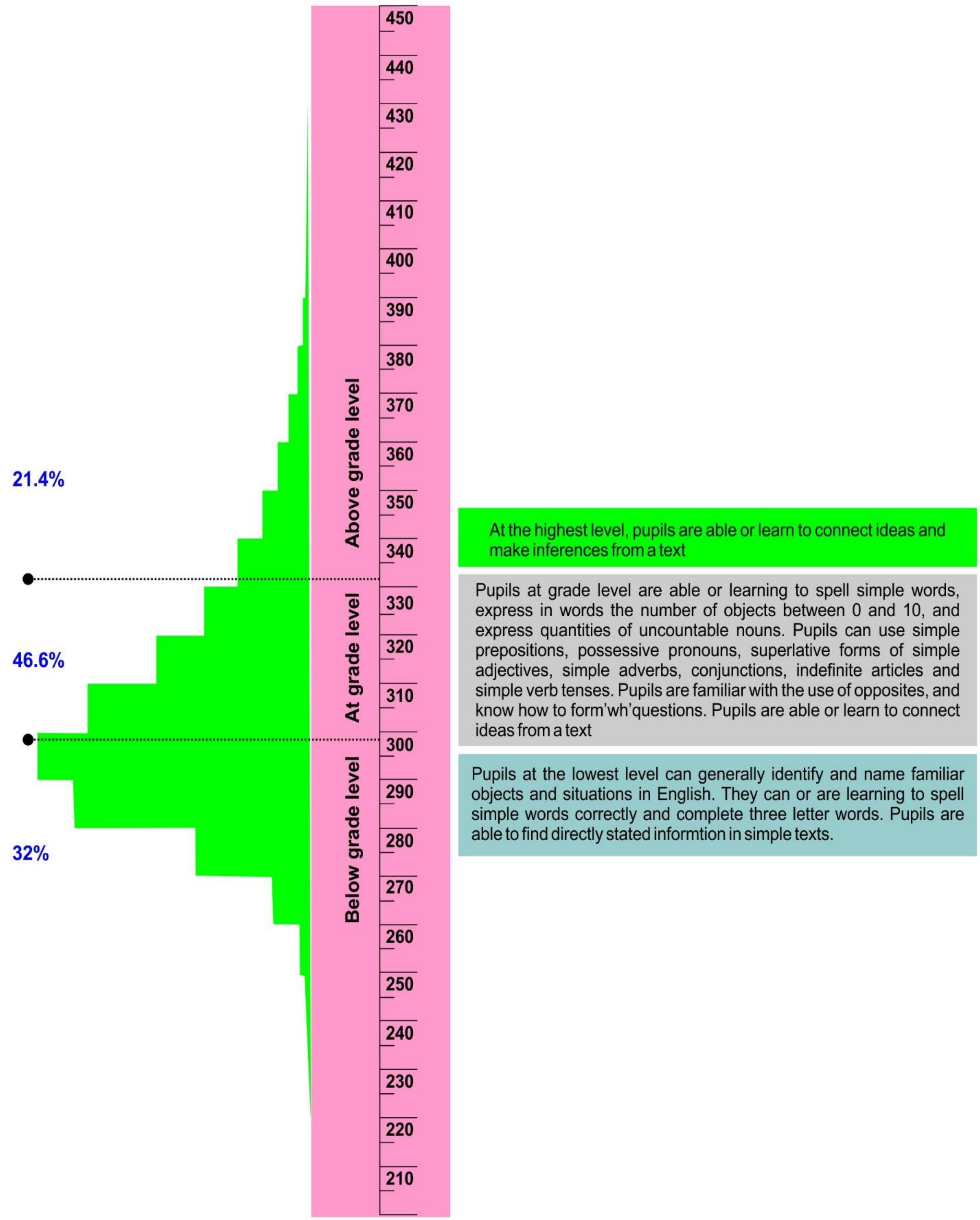

Figure 2.1: English Scale for 2017

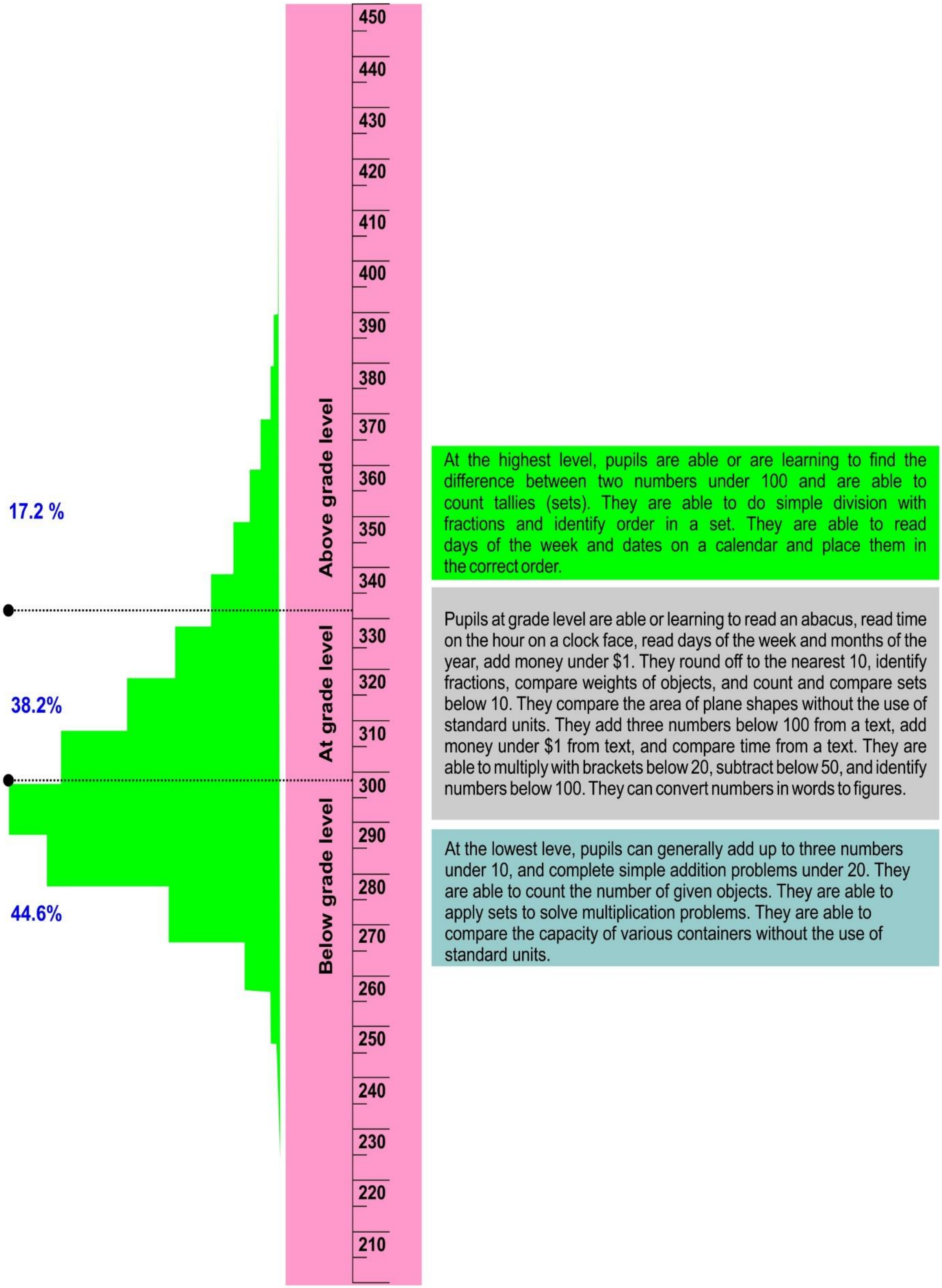

Figure 2.2: Mathematics Scale for 2017

The pink bars in the middle of the figures represent the scales and the units of measurement. In 2012 the mean performance in English and Mathematics was fixed at 300 and the standard deviation to 25. The horizontal bars on the left are frequencies of learners at each location in this scale. Learners at the top of the scale are high achievers; learners at the bottom of the scale are low achievers. Items are placed on the same scale by their difficulty with difficult items at the top of the scale and easy items at the bottom of the scale. Learner achievement and item difficulty are matched on the scale in such a way that a learner with the same achievement score as the difficulty of item has 50 per cent chance of responding correctly to this item. Consequently, learners with an achievement score higher than an item difficulty have more than 50 per cent of responding correctly and similarly, learners with an achievement score lower that the difficulty of an item have less than 50 percent chance of responding correctly.

Placing items on the same scale as learners enables describing the skills of learners at each location on the scale and defining meaningful cut points such as below, at and above grade proficiency levels. Cut points between the proficiency levels are drawn in Figure 2.1 and Figure 2.2 on the left of the pink bar and descriptions of the skills that learners are learning to master at each level are included on the right of the pink bar. Figure 2.1 shows that in English, 21.4% of grade three population performed above grade level in 2017, 46.6% at grade level and 32.0% below grade level. The percentages for Mathematics were 17.2% above grade level, 38.2% at grade level and 44.6% below grade level.

2.4 Performance in English 2017

Figure 2.3 shows the performance distribution of grade two learners in English in Zimbabwe. The results show that 21.4% learners are above grade level, 46.6% at grade level and 32.0% below grade level.

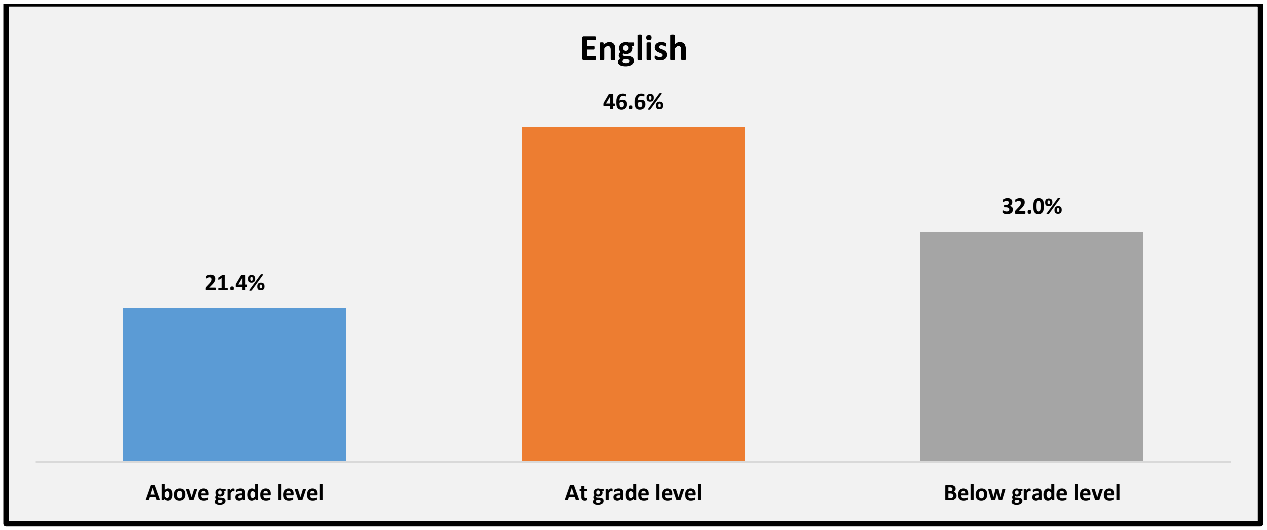

Figure 2.3: English Proficiency levels

At the highest level (above grade level), learners are able or learn to connect ideas and make inference from text. Learners at grade level are able or learning to spell simple words, express in words the number of objects between 0 and 10, and express quantities of uncountable nouns. Learners can use simple prepositions, possessives pronouns, superlative forms of simple adjectives, simple adverbs, conjunctions, indefinite articles and simple verb tenses. Learners are familiar with use of opposites, and know how to form 'wh' questions. Learners are able or learn to connect ideas from a text. Learners at the lowest level (below grade level) can generally identify and name familiar objects and situations in English. They can or are learning to spell simple words correctly and complete three letter words. Learners are able to find directly stated information in simple texts.

2.5 Performance in Mathematics 2017

Figure 2.4 shows the performance distribution of grade two learners in Mathematics in Zimbabwe. The results show that 17.2% learners are above grade level, 38.2% at grade level and 44.6% below grade level.

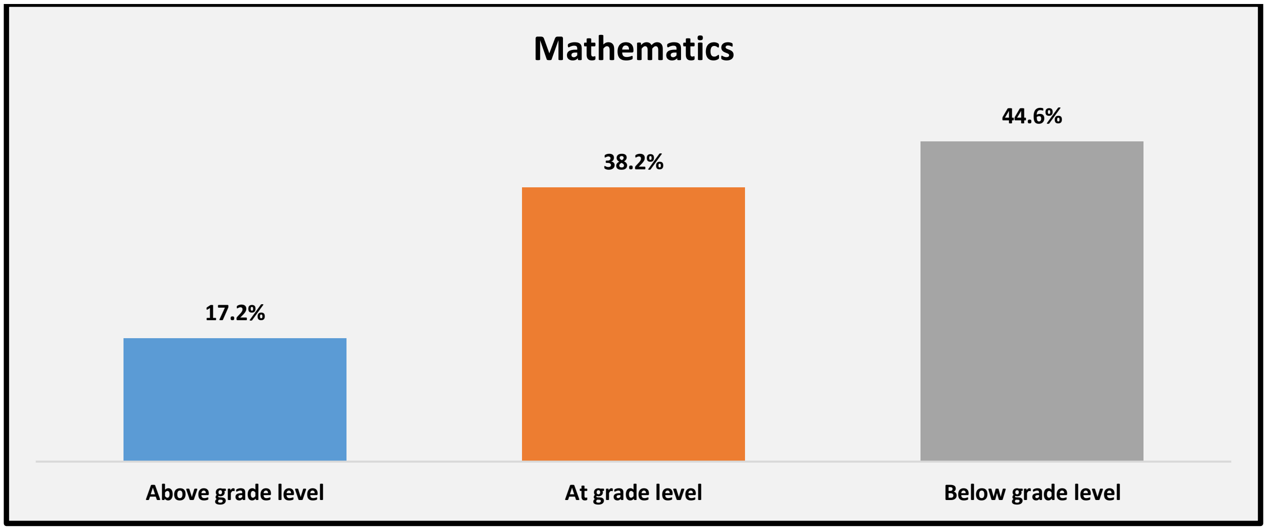

Figure 2.4: Mathematics Proficiency levels

At the highest level (above grade level), learners are able or are learning to find the difference between two numbers under 100 and are able to count tallies (sets). They are able to do simple division with fractions and identify order in a set. They are able to read days of the week and dates on a calendar and place them in the correct order.

Learners at grade level are able or learning to read an abacus, read time on the hour on a clock face, read days of the week and months of the year, add money under $1. They round off to the nearest 10, identify fractions, compare weights of objects and count and compare sets below 10. They compare the area of the plane shapes without the use of standard units. They add three numbers below 100 from a text, add money under $1 from text and compare time from a text. They are able to multiply with brackets below 20, subtract below 50, and identify numbers below 100. They can convert numbers in words to figures. At the lowest level (below grade level), learners can generally add up to three numbers under 10, and complete simple addition problems under 20. They are able to count the number of given objects. They are able to apply sets to solve multiplication problems. They are able to compare the capacity of various containers without the use of standard units.

2.6 Overall results in English and Mathematics since 2012

Table 2.3 shows the overall performance in English and Mathematics of grade two learners in 2012, 2015, 2016 and 2017. Performance in both English and Mathematics increased significantly between 2012 and 2017. English performance increased significantly from 313.56 in 2016 to 314.70 in 2017. This resulted in 68% of the learners falling at and above grade level. However, there was a slight increase in the number of learners who performed below grade level between 2016 and 2017. For Mathematics, the average mean performance decreased significantly from 313.85 in 2016 to 309.49 in 2017. This resulted in 55.4% of the learners falling at and above grade level and there was an increase in the number of learners who performed below grade level between 2016 and 2017.

Table 2.3: Overall performance in English and Mathematics in 2012, 2015, 2016 and 2017

English	**2012**		**2015**		**2016**		**2017**	**2012-2017**
Mean Performance	300(1.00)	⇑	304.2(0.78)	⇑	313.56(0.19)	⇑	314.70(0.21)	⇑
Mathematics	**2012**		**2015**		**2016**		**2017**	**2012-2017**
Mean Performance	300(0.97)	⇑	312.2(0.59)	⇔	313.85(0.16)	⇓	309.49(0.18)	⇑

Where {⇑} indicate a significant increase, {⇔} no change and {⇓} significant decrease.
Standard errors are reported between brackets.

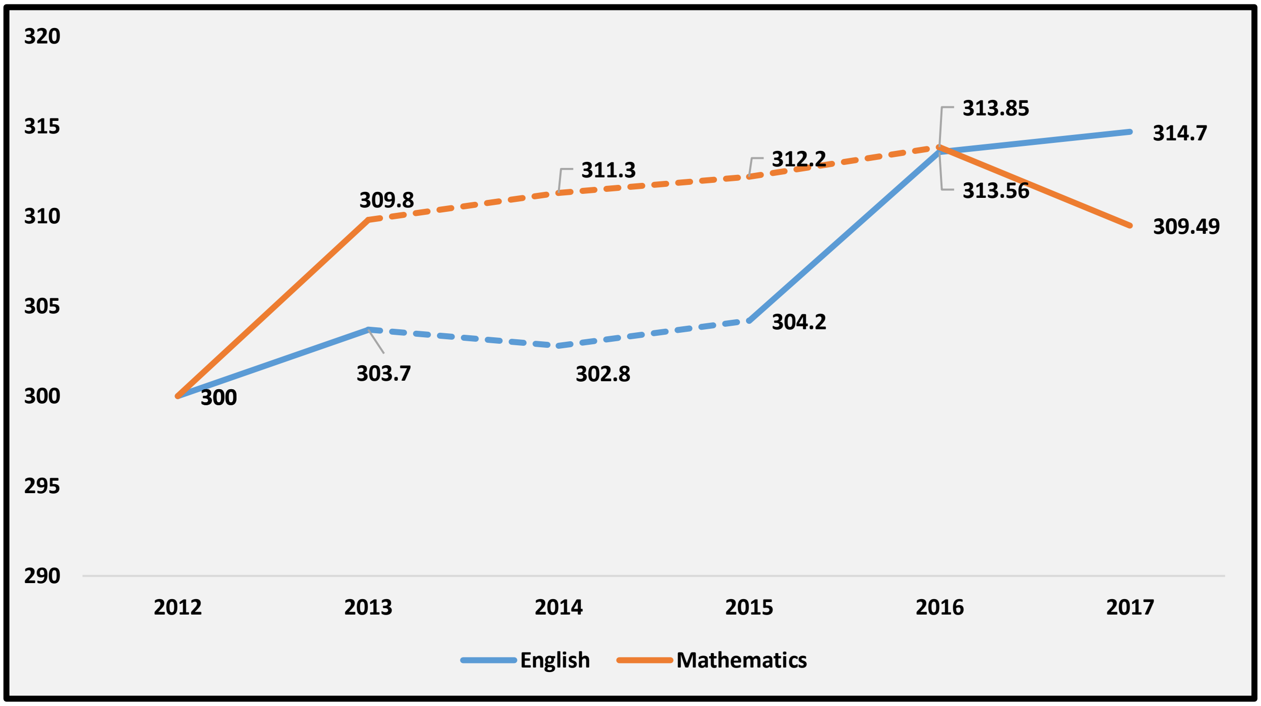

Figure 2.5: Mean performance in English and Mathematics (2012 – 2017)

Figure 2.5 graphically presents the change in average performance in English and Mathematics from 2012 to 2017. A solid line indicates significant change while a dotted line indicates no significant change. The graph shows a significant increase in English performance from 2016 to 2017 and a significant decrease in Mathematics performance between 2016 and 2017.

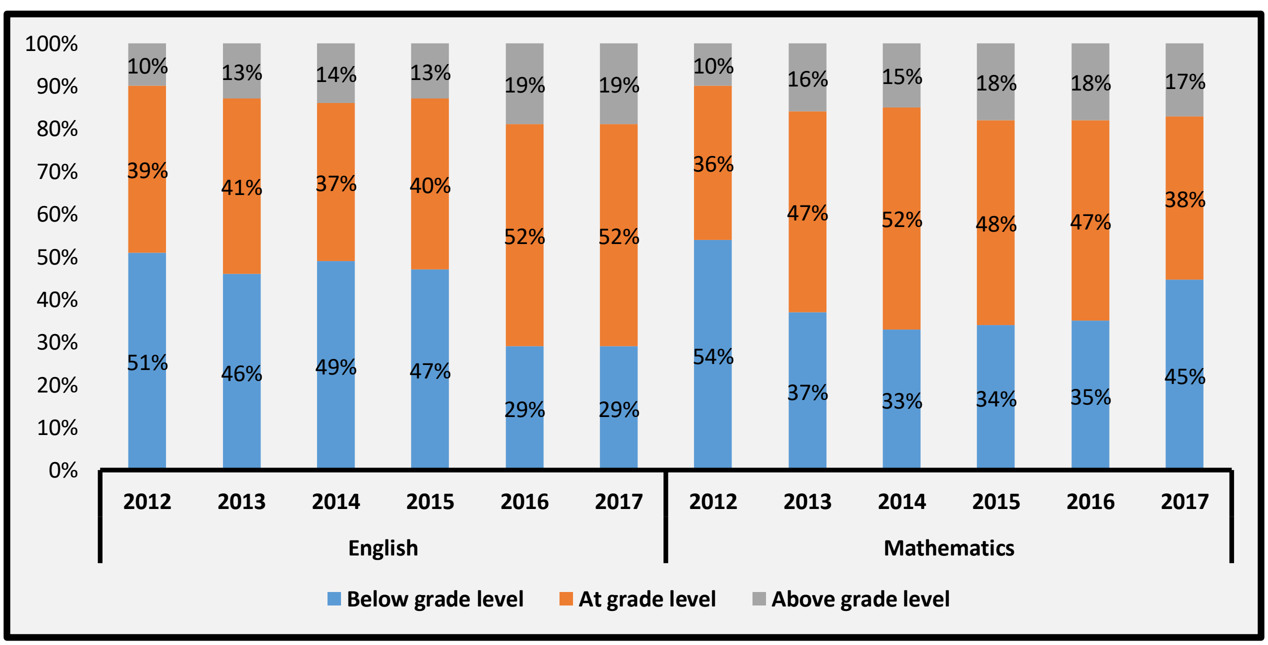

Figure 2.6: Percentages below, at and above grade level in English and Mathematics since 2012

Figure 2.6 shows the percentage of learners in each proficiency level of 2012, 2015, 2016 and 2017 for both English and Mathematics. While the change in these percentages cannot be tested for statistical significance for technical reasons, the results indicate that the percentage of learners in both the middle and the top proficiency levels has been increasing up to 2016. In 2017, the percentage of learners in the middle proficiency level for both English and Mathematics decrease and the percentage of learners in the bottom proficiency level increased.

2.7 Differences in performance by demographic and family background

Results in English and Mathematics are presented by the following demographic and family background variables: gender, location, province, age group, language spoken at home, time spent working for the family per day, number of home possessions, number of educational resources and highest parental education. Performance is presented as mean scale scores.

2.7.1 Gender

Mean performance was calculated for English and Mathematics with respect to gender. According to Table 2.4 and Figure 2.7, girls outperformed boys in English in 2012, 2015, 2016 and 2017. In 2017, the mean performance of English was 312.33 for boys and 317.82 for girls. This difference was statistically significant at 5% level of significance. For Mathematics, the mean performance was 308.16 and 311.27 for boys and girls respectively. The difference was also statistically significant at 5%. The difference in performance between boys and girls was smaller in Mathematics as compared to English across the cycles.

Table 2.4: Performance in English and Mathematics by Gender since 2012

English	**2012**		**2015**		**2016**		**2017**	**2012-2017**
Boys	297.5(0.95)	⇔	301.4(0.76)	⇑	311.34(0.28)	⇑	312.33(0.29)	⇑
Girls	302.6(1.12)	⇑	307.1(0.91)	⇑	315.72(0.29)	⇑	317.82(0.31)	⇑
Difference (G-B)	⇑		⇑		⇑		⇑	
Mathematics	**2012**		**2015**		**2016**		**2017**	**2012-2017**
Boys	298.3(0.97)	⇑	310.8(0.58)	⇑	312.76(0.24)	⇓	308.16(0.25)	⇑
Girls	301.8(1.03)	⇑	314.2(0.70)	⇔	314.92(0.24)	⇓	311.27(0.26)	⇑
Difference (G-B)	⇑		⇑		⇔		⇑	

Where {⇑} indicate a significant increase, {⇔} no change and {⇓} significant decrease. Standard errors are reported between brackets.

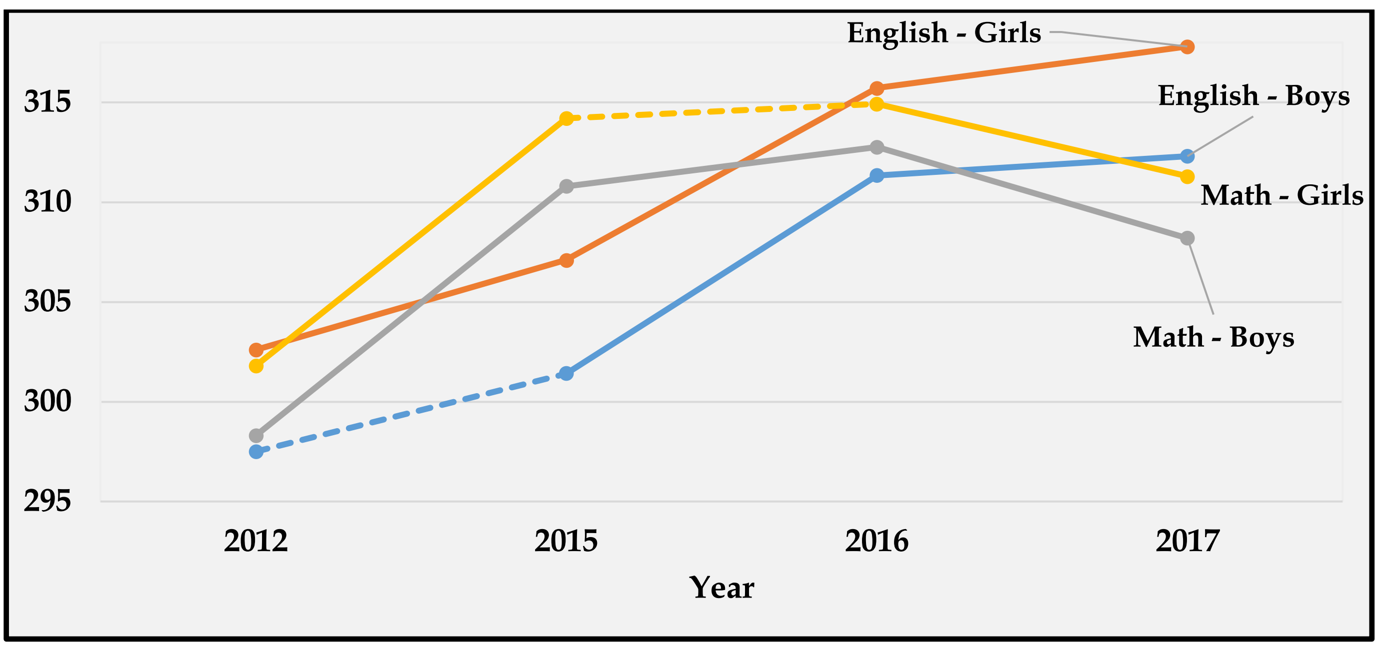

Figure 2.7: Mean performance in English and Mathematics by gender since 2012

Table 2.5 is a cross-tabulation of English and Mathematics proficiency levels and gender for 2016. The results indicate that 18.0% of the boys and 25.7% of the girls performed above grade level in English. At grade level, there isn't much difference in the percentage distribution of boys (45.9%) and girls (47%). In Mathematics 16.0% of the boys and 19.4% of the girls performed above grade level while 35.6% and 40.0% of boys and girls respectively performed at grade level. Overall, the percentage of boys at or above grade level in English was 63.9% and 72.7% for girls. The rest of the information is shown in Table 2.5 below.

Table 2.5: Cross-tabulation of Proficiency level and gender for 2017

Subject	Proficiency Level	Boy	Girl	Total
English	Above grade level	18.0%(1404)	25.7%(2001)	21.9%(3405)
	At grade level	45.9%(3581)	47.0%(3656)	46.5%(7237)
	Below grade level	36.1%(2815)	27.3%(2123)	31.7%(4938)
	Total	100%(7800)	100%(7780)	100%(15580)
Mathematics	Above grade level	16.0%(1248)	19.4%(1507)	17.7%(2755)
	At grade level	35.6%(2779)	40.0%(3114)	37.8%(5893)
	Below grade level	48.4%(3773)	40.6%(3159)	44.5%(6932)
	Total	100%(7800)	100%(7780)	100%(15580)

2.7.2 School Location

According to Table 2.6, learners from urban areas outperformed learners from rural areas in both English and Mathematics in 2012, 2015 and 2016 and results of ZELA 2017 are no different. In 2017, students in urban areas outperformed students in rural areas in both English and Mathematics. Table 2.6 below shows the English and Mathematics performance of learners from urban and rural schools.

Table 2.6: Performance in English and Mathematics by school location since 2012

English	2012		2015		2016		2017	2012-2017

Urban	313.5(2.77)	⇑	324.4(1.83)	⇑	330.93(0.40)	⇑	345.42(0.68)	⇑
Difference	⇓		⇓		⇓		⇓	
Rural	296.4(1.04)	⇔	298.5(0.85)	⇑	306.34(0.19)	⇑	310.19(0.19)	⇑
Mathematics	**2012**		**2015**		**2016**		**2017**	**2012-2017**
Urban	311.2(2.14)	⇑	325.5(1.36)	⇓	321.18(0.32)	⇑	329.71(0.49)	⇑
Difference	⇓		⇓		⇓		⇓	
Rural	297.1(1.08)	⇔	308.5(0.63)	⇑	310.80(0.20)	⇓	306.52(0.18)	⇑

Where {⇑} indicate a significant increase, {⇔} no change and {⇓} significant decrease. Standard errors are reported between brackets.

In English, learners from urban areas had a mean score of 345.42 as compared to learners from rural schools who had a mean score of 310.19 in 2017. This represents a difference of 35.23 score points. In Mathematics the difference in performance between learners from urban areas and learners from rural areas in 2017 was 23.19 score points. These results indicate that the difference in mean performance was large, especially in English. Of importance to note is the significant decrease in Mathematics performance of learners from rural schools between 2016 and 2017. Figure 2.8 below show that the difference in mean English performance between urban and rural areas grew larger over time (2012 – 2-17) whilst that of Mathematics diminished between 2012 and 2016 and then increased once again in 2017.

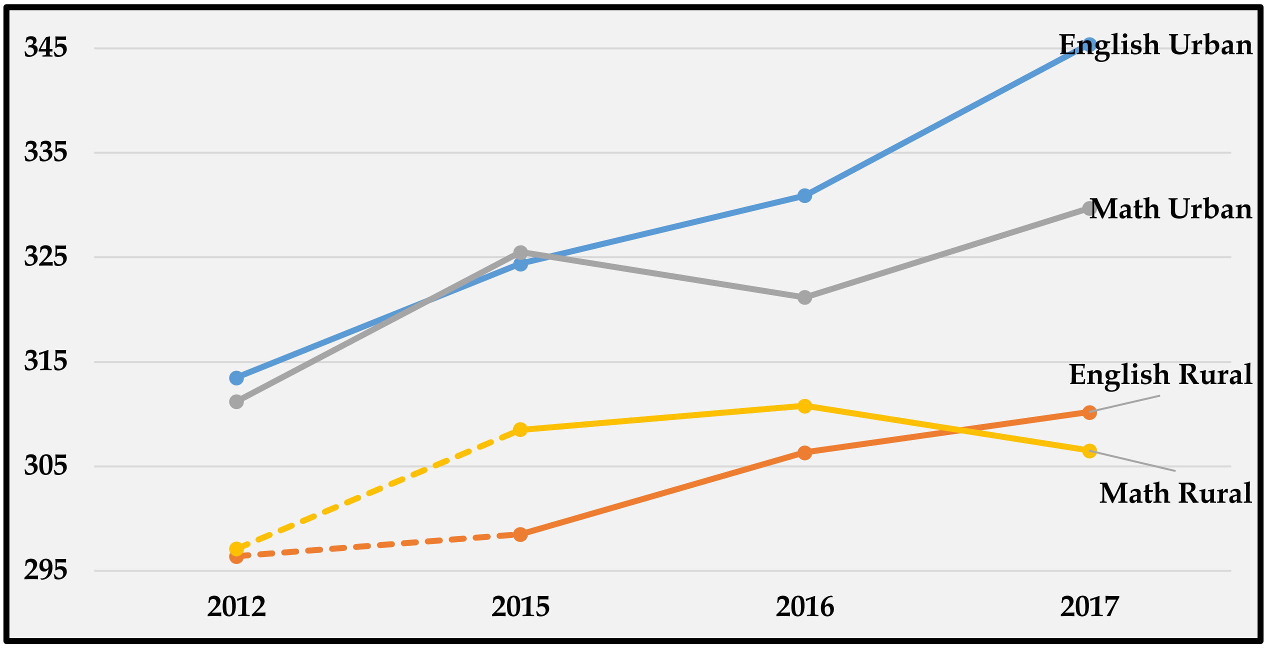

Figure 2.8: Mean performance in English and Mathematics by location since 2012

Figure 2.8 above shows a larger performance difference between English Urban and English Rural as compared to the difference between Mathematics Urban and Mathematics Rural. All the line graphs in Figure 2.8 depict an upward trend in both English and Mathematics performance from 2012 to 2017.

Table 2.7: Cross-tabulation of Proficiency level and location for 2017

Subject	**Proficiency Level**	**Urban**	**Rural**	**Total**
English	Above grade level	66.2%(1397)	14.8%(2119)	21.4%(3516)
	At grade level	27.5%(581)	49.4%(7094)	46.6%(7675)
	Below grade level	6.3%(133)	35.8%(5141)	32.0%(5274)
	Total	100%(2111)	100%(14354)	100%(16465)
Mathematics	Above grade level	51.3%(1083)	12.2%(1752)	17.2%(2835)
	At grade level	36.0%(759)	38.5%(5527)	38.2%(6286)
	Below grade level	12.7%(269)	49.3%(7075)	44.6%(7344)

	Total	100%(2111)	100%(14354)	100%(16465)

Consistent with the reported trends in mean English performance, Table 2.7 shows that the percentage of learners at or above grade level was 93.7% (up from 89.3% in 2016) for learners from urban areas whilst the corresponding percentage for learners from rural areas was 64.2% (up from 64% in 2016). For Mathematics performance, 87.3% and 50.7% of learners from urban and rural schools performed at or above grade level in 2017.

2.7.3 Province

Table 2.8: Performance in English by province since 2012

English	2012		2015		2016		2017	2012-2017
Bulawayo	316.0(2.66)	⇑	324.7(2.25)	⇑	333.34(0.68)	⇑	343.91(1.64)	⇑
Harare	321.1(5.24)	⇔	325.8(1.97)	⇔	328.68(0.60)	⇑	345.00(1.05)	⇑
Manicaland	297.5(1.23)	⇔	302.9(2.46)	⇑	314.80(0.61)	⇔	313.54(0.51)	⇑
Mashonaland Central	295.5(1.31)	⇔	297.3(1.6)	⇑	304.18(0.49)	⇑	308.50(0.53)	⇑
Mashonaland East	296.9(2.27)	⇑	303.8(1.88)	⇑	312.94(0.63)	⇑	315.63(0.56)	⇑
Mashonaland West	299.1(3.52)	⇔	300.8(3.6)	⇔	301.49(0.47)	⇑	309.74(0.52)	⇑
Masvingo	299.3(1.03)	⇔	302.9(2.57)	⇔	307.23(0.57)	⇑	312.38(0.69)	⇑
Matabeleland North	290.6(2.35)	⇔	295.1(2.58)	⇑	304.9(0.52)	⇑	311.02(0.65)	⇑
Matabeleland South	294.0(5.66)	⇔	300.5(1.70)	⇑	310.11(0.58)	⇔	309.81(0.62)	⇑
Midlands	297.1(4.05)	⇔	300.0(1.76)	⇑	311.47(0.60)	⇑	314.89(0.49)	⇑

Where {⇑} indicate a significant increase, {⇔} no change and {⇓} significant decrease. Standard errors are reported between brackets.

Mean performances in English and Mathematics were compared over time and provinces were compared with each other. In achievement, learners from Bulawayo and Harare outperformed all the other provinces in 2017 with higher mean performances in English and Mathematics whereas Mashonaland West, Mashonaland Central and Matabeleland South had the lowest mean performance. It needs to be noted that, between 2012 to 2017, all provinces recorded significant improvement in English as shown in Table 2.8 above. For Mathematic, Table 2.9 shows that all provinces except Mashonaland West recorded significant performance increase between 2012 and 2017.

Table 2.9: Performance in Mathematics by province since 2012

Mathematics	**2012**		**2015**		**2016**		**2017**	**2012-2017**
Bulawayo	314.8(1.69)	⇑	325.6(1.80)	⇔	321.35(0.54)	⇑	327.59(1.16)	⇑
Harare	316.8(4.01)	⇑	328.5(1.52)	⇓	320.96(0.49)	⇑	330.89(0.78)	⇑
Manicaland	297.4(1.24)	⇑	311.9(1.79)	⇔	314.76(0.59)	⇓	308.17(0.46)	⇑
Mashonaland Central	296.4(1.13)	⇑	307.8(1.62)	⇔	309.04(0.49)	⇓	304.04(0.51)	⇑
Mashonaland East	298.3(2.42)	⇑	313.2(1.66)	⇔	314.47(0.56)	⇓	310.24(0.48)	⇑
Mashonaland West	300.9(4.25)	⇔	309.2(2.85)	⇔	305.66(0.43)	⇔	305.45(0.45)	⇔
Masvingo	300.1(1.45)	⇑	311.8(1.58)	⇔	311.68(0.55)	⇓	308.96(0.65)	⇑
Matabeleland North	290.6(2.71)	⇑	305.1(1.9)	⇔	307.25(0.47)	⇔	307.07(0.53)	⇑
Matabeleland South	294.0(4.78)	⇑	310.4(1.39)	⇔	314.38(0.57)	⇓	304.80(0.57)	⇑

Midlands	296.5(3.74)	⇑	307.3(1.31)	⇑	316.242(0.60)	⇓	311.57(0.42)	⇑

Where {⇑} indicate a significant increase, {⇔} no change and {⇓} significant decrease. Standard errors are reported between brackets.

Between 2016 and 2017, only Manicaland and Matabeleland South showed no significant change in English performance, while all the rest of the provinces recorded significant increases. In Mathematics, there were significant performance decreases in Manicaland, Mashonaland Central, Mashonaland East, Masvingo, Matabeland South and Midlands between 2016 and 2017. Harare and Bulawayo increase significantly in Mathematics performance over the same period.

Table 2.10: Cross-tabulation of Proficiency level and province for 2017

	Above grade level	**At grade level**	**Below grade level**	**Total**
English				
Bulawayo	65.3%(260)	25.6%(102)	9.0%(36)	100%(398)
Harare	66.3%(546)	26.9%(222)	6.8%(56)	100%(824)
Manicaland	19.3%(512)	49.4%(1310)	31.3%(829)	100%(2651)
Mashonaland Central	11.4%(185)	50.5%(819)	38.1%(617)	100%(1621)
Mashonaland East	21.8%(457)	51.0%(1071)	27.2%(570)	100%(2098)
Mashonaland West	15.3%(326)	44.7%(954)	40.1%(856)	100%(2136)
Masvingo	19.5%(249)	47.3%(604)	33.2%(423)	100%(1276)
Matabeleland North	16.3%(256)	45.1%(708)	38.6%(607)	100%(1571)
Matabeleland South	15.0%(201)	46.3%(619)	38.6%(516)	100%(1336)
Midlands	20.5%(524)	49.6%(1266)	29.9%(764)	100%(2554)
Total	21.4%(3516)	46.6%(7675)	32.0%(5274)	100%(16465)

Mathematics	Above grade level	At grade level	Below grade level	Total
Bulawayo	48.2%(192)	34.7%(138)	17.1%(68)	100%(398)
Harare	55.5%(457)	33.3%(274)	11.3%(93)	100%(824)
Manicaland	15.9%(422)	38.9%(1031)	45.2%(1198)	100%(2651)
Mashonaland Central	9.5%(154)	36.9%(598)	53.6%(869)	100%(1621)
Mashonaland East	16.7%(350)	43.1%(905)	40.2%(843)	100%(2098)
Mashonaland West	11.2%(239)	35.2%(751)	53.7%(1146)	100%(2136)
Masvingo	16.8%(214)	39.7%(506)	43.6%(556)	100%(1276)
Matabeleland North	13.3%(209)	35.8%(562)	50.9%(800)	100%(1571)
Matabeleland South	11.3%(151)	33.5%(448)	55.2%(737)	100%(1336)
Midlands	17.5%(447)	42.0%(1073)	40.5%(1034)	100%(2554)
Total	17.2%(2835)	38.2%(6286)	44.6%(7344)	100%(16465)

Percentages at or above grade level were computed for each of the 10 provinces and the results are shown in Table 2.10 above. The results indicate that Bulawayo and Harare had the highest percentages of students performing above grade level in both English and Mathematics. Bulawayo and Harare had 90.0% and 93.2% respectively of their learners performing at or above grade level in English in 2017. In Mathematics, 82.9% and 88.8% of learners from Bulawayo and Harare respectively performed at or above grade level. Mashonaland West, Mashonaland Central, Matabeleland South and Matabeleland North had the largest percentages of students performing below grade level in both English and Mathematics.

2.7.4 Age group

Mean performances for learners' age groups where computed and compared over time. In English, there was a significant increase in mean performance between 2012 to 2017 for all age groups. While there were no significant increases in English performance between 2016 and 2017 for learners aged 6 and below, aged 8, aged 9, aged 13 and learners aged 14 or above, the rest of the other age groups experienced significant increases in performance as shown in Table 2.11 below.

Table 2.11: Performance in English by age-group since 2012

English	**2012**		**2015**		**2016**		**2017**	**2012-2017**
Aged 6 and below	298.2(3.08)	⇔	299.2(1.73)	⇑	320.81(5.34)	⇔	327.08(5.89)	⇑
Age 7	305.7(1.90)	⇔	311.3(1.89)	⇔	308.46(1.54)	⇑	316.41(2.26)	⇑
Age 8	303.0(1.32)	⇔	307.6(1.03)	⇑	319.64(0.45)	⇔	319.19(0.53)	⇑
Age 9	296.7(0.92)	⇔	300.0(0.85)	⇑	316.92(0.32)	⇓	315.97(0.31)	⇑
Age 10	294.7(1.00)	⇔	298.5(0.86)	⇑	306.94(0.38)	⇑	310.28(0.40)	⇑
Age 11	295.3(1.03)	⇔	297.1(1.00)	⇑	305.935(0.61)	⇑	309.53(0.66)	⇑
Age 12	293.9(1.52)	⇔	298.1(1.57)	⇑	306.69(1.04)	⇑	310.95(0.96)	⇑
Age 13	292.7(3.68)	⇔	299.0(1.65)	⇑	306.59(1.33)	⇔	309.19(1.31)	⇑
Age 14 or above	298.7(1.90)	⇔	299.6(3.65)	⇔	305.32(1.57)	⇔	309.00(1.48)	⇑

Where {⇑} indicate a significant increase, {⇔} no change and {⇓} significant decrease. Standard errors are reported between brackets.

The Mathematics performance by age group is shown in Table 2.12. The table shows that there was a significant increase in Mathematics performance for all age groups except for learners aged 14 or above between 2012 and 2017. However, between 2016 and 2017, most of the age groups experienced significant decreases in Mathematics performance. Only learners aged 7 experienced a significant increase in Mathematics performance from a mean of 308.46 score points in 2016 to a mean of 316.41 score points in 2017.

Table 2.12: Performance in Mathematics by age-group since 2012

Mathematics	2012		2015		2016		2017	2012-2017
Aged 6 and below	295.8(3.22)	⇑	308.6(1.30)	⇔	316.14(4.79)	⇔	315.59(4.12)	⇑
Age 7	303.5(1.49)	⇑	316.9(1.12)	⇓	306.87(1.21)	⇑	311.28(1.85)	⇑
Age 8	302.2(1.23)	⇑	314.4(0.75)	⇔	315.60(0.36)	⇓	311.16(0.42)	⇑
Age 9	297.7(1.01)	⇑	309.7(0.71)	⇑	315.97(0.27)	⇓	310.49(0.26)	⇑
Age 10	296.0(1.07)	⇑	308.3(0.84)	⇑	310.77(0.36)	⇓	306.70(0.38)	⇑
Age 11	297.2(1.19)	⇑	308.1(0.89)	⇑	310.57(0.57)	⇓	307.41(0.63)	⇑
Age 12	297.0(1.73)	⇑	309.3(1.47)	⇔	312.50(1.06)	⇓	306.86(0.90)	⇑
Age 13	297.0(4.02)	⇑	309.1(1.55)	⇔	309.83(1.46)	⇔	309.09(1.21)	⇑
Age 14 or above	304.6(2.26)	⇔	311.6(4.70)	⇔	312.332(1.49)	⇓	306.41(1.38)	⇔

Where {⇑} indicate a significant increase, {⇔} no change and {⇓} significant decrease.
Standard errors are reported between brackets.

2.7.5 Language spoken at home

Language spoken at home had four groups; Shona, Ndebele, English and Others. The other languages included Venda, Tonga, Shangani, Kalanga, Sotho, Ndau and Nambya. Descriptive statistics shown in Table 2.2 above indicate that in 2017, 73% of the learners spoke Shona at home, 16% spoke Ndebele, 3% spoke English and 8% spoke other languages. Mean performances for learners by languages spoken at home where computed and compared over time. The results in Table 2.13 show the performance in English and Mathematics by language spoken at home since 2012.

Table 2.13: Performance in English and Mathematics by language spoken at home since 2012

English	**2012**		**2015**		**2016**		**2017**	**2012-2017**
Shona	300.8(0.99)	⇔	304.0(0.90)	⇑	312.95(0.24)	⇑	314.78(0.24)	⇑
Ndebele	297.2(1.73)	⇑	303.2(1.15)	⇑	317.41(0.46)	⇓	314.29(0.49)	⇑
English	331.5(7.30)	⇔	330.1(2.36)	⇔	329.46(1.51)	⇑	338.74(1.64)	⇔
Other	291.4(1.70)	⇑	298.9(1.55)	⇑	304.49(0.62)	⇔	305.96(0.62)	⇑
Mathematics	**2012**		**2015**		**2016**		**2017**	**2012-2017**
Shona	300.8(1.00)	⇑	312.4(0.73)	⇔	313.67(0.21)	⇓	309.69(0.21)	⇑
Ndebele	297.4(1.73)	⇑	311.0(1.01)	⇑	315.21(0.38)	⇓	309.41(0.42)	⇑
English	322.1(5.36)	⇔	329.0(1.75)	⇓	320.99(1.13)	⇔	323.65(1.14)	⇔
Other	292.3(2.17)	⇑	306.7(1.23)	⇑	309.8(0.57)	⇓	302.64(0.57)	⇑

Where {⇑} indicate a significant increase, {⇔} no change and {⇓} significant decrease. Standard errors are reported between brackets.

Between 2012 and 2017, results show a significant increase in both English and Mathematics performance for learners who speak Shona, Ndebele and Other Languages at home. Although learners who speak English at home have always outperformed learners who do not speak English at home since 2012, their performance has not changed significantly between 2012 and 2017 in both English and Mathematics. Between 2016 and 2017, the results show a significant increase in English performance for learners who speak Shona or English at home. Learners who speak Ndebele at home decreased significantly in their English performance from a mean of 317.41 score points in 2016 to 314.29 score points in 2017. In achievement, learners who speak English at home achieved the highest scores in English and Mathematics, whereas those speaking Other languages obtained the lowest scores in both subjects. Long term improvements in the mean English performance were observed for learners who speak Ndebele at home between 2012 and 2016 (Long term improvements are indicated by long solid lines in Figure 2.9.)

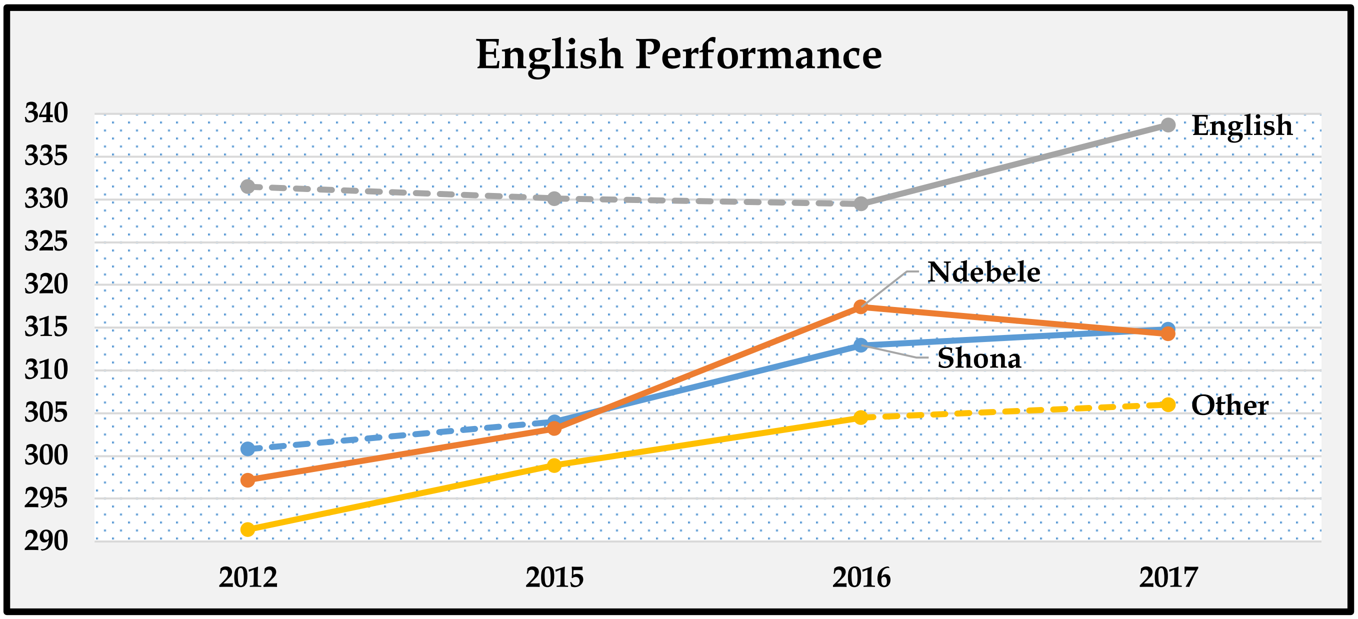

Figure 2.9: Mean performance in English by language spoken at home since 2012

Figure 2.9 above shows that the English performance of learners who speak English at home was generally higher that of those who speak indigenous languages. The graph further shows a significant increase in English performance between 2016 and 2017 for learners who speak English and those who speak Shona at home. The English performance of learners who speak Ndebele at home increased significantly between 2012 and 2015 and between 2015 and 2016, however it decreased significantly between 2016 and 2017.

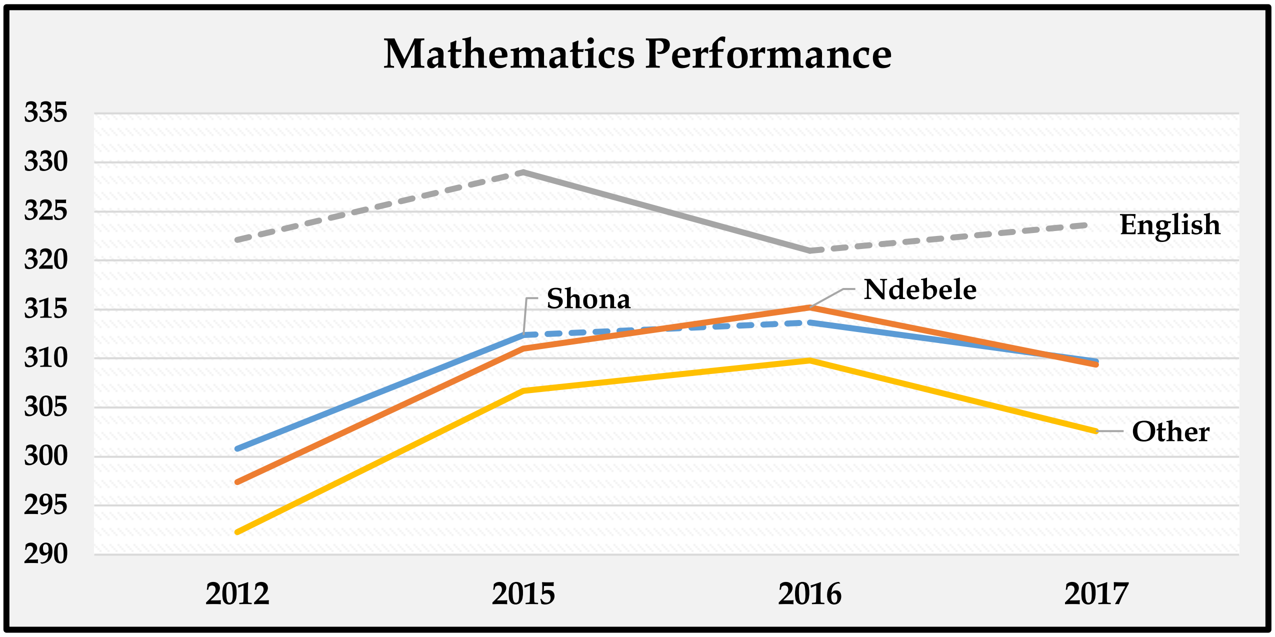

Figure 2.10: Mean performance in Mathematics by language spoken at home since 2012

Figure 2.10 and Figure 2.9 are similar in that learners who speak Ndebele and Other languages at home have shown long term significant improvement in English and Mathematics between 2012 and 2016. However, there has been a decrease in English and Mathematics performance between 2016 and 2017 for learners who speak Ndebele at home. For Mathematics, learners who speak English at home have always outperformed those who speak indigenous languages. Table 2.14 is a cross-tabulation of proficiency levels and language spoken at home for 2017. The majority (54.9%) of learners who speak English at home performed above grade level in English test whilst 42.4% of learners who speak English at home performed above grade level in Mathematics test. Learners who speak other languages at home had the highest representation in the below grade level category, contributing 45.8% and 61.1% in English and Mathematics respectively.

Table 2.14: Cross-tabulation of Proficiency level and language spoken at home for 2017

Proficiency Level	**Shona**	**Ndebele**	**English**	**Other**	**Total**
English					

Above grade level	21.4%(2570)	20.1%(532)	54.9%(268)	11.0%(146)	21.4%(3516)
At grade level	47.4%(5687)	47.9%(1268)	29.9%(146)	43.2%(574)	46.6%(7675)
Below grade level	31.2%(3744)	32.0%(848)	15.2%(74)	45.8%(608)	32.0%(5274)
Total	100%(12001)	100%(2648)	100%(488)	100%(1328)	100%(16465)
Mathematics					
Above grade level	17.2%(2064)	16.6%(439)	42.4%(207)	9.4%(125)	17.2%(2835)
At grade level	39.1%(4696)	38.8%(1027)	35.2%(172)	29.4%(391)	38.2%(6286)
Below grade level	43.7%(5241)	44.6%(1182)	22.3%(109)	61.1%(812)	44.6%(7344)
Total	100%(12001)	100%(2648)	100%(488)	100%(1328)	100%(16465)

2.7.6 Time per day working for the family

According to Table 2.15, learners that worked less than an hour per day for their families performed better than those that worked one hour or more in both English and Mathematics over the years from 2012 to 2017, with the exception of Mathematics performance for 2012. In 2016, learners that worked less than an hour per day for their families had a mean of 317.66 score points in English as compared to 316.97 score points in 2017 and this difference of 0.69 score points was statistically insignificant. For Mathematics, there was a significant decrease in performance between 2016 and 2017.

Table 2.15: Performance in English and Mathematics by time spent per day working for the family since 2012

English	**2012**		**2015**		**2016**		**2017**	**2012-2017**
Less than 1 hour	302.1(1.30)	⇑	306.8(1.12)	⇑	317.66(0.36)	⇔	316.97(0.38)	⇑

Difference	⇑		⇑		⇑		⇑	
1 hour or more	299.7(1.07)	⇔	303.7(0.81)	⇑	311.64(0.24)	⇑	313.64(0.25)	⇑
Mathematics	**2012**		**2015**		**2016**		**2017**	**2012-2017**
Less than 1 hour	301.3(1.22)	⇑	314.3(0.90)	⇔	315.84(0.30)	⇓	311.18(0.32)	⇑
Difference	⇔		⇑		⇑		⇑	
1 hour or more	299.9(1.03)	⇑	312.4(0.58)	⇔	312.91(0.21)	⇓	308.69(0.21)	⇑

Where {⇑} indicate a significant increase, {⇔} no change and {⇓} significant decrease. Difference(Φ)=Less than 1 hour - 1 hour or more. Standard errors are reported between brackets.

In 2017, the differences in performance between learners that worked less than an hour per day for their families and learners that worked one hour or more were 3.33 score points in English and 2.49 score points in Mathematics and these were both statistically significant. Figure 2.11 shows the mean performance in English and Mathematics by time per day spent working for the family from 2012 to 2017. The results indicate a long term significant increase in English performance from 2012 to 2016 for learners that worked less than an hour per day. However, between 2016 and 2017 the results show no significant change in performance. For Mathematics, the performance for learners that worked less than an hour per day increased significantly between 2012 and 2015 but remained stable between 2015 and 2016. Between 2016 and 2017, the Mathematics performance decreased significantly.

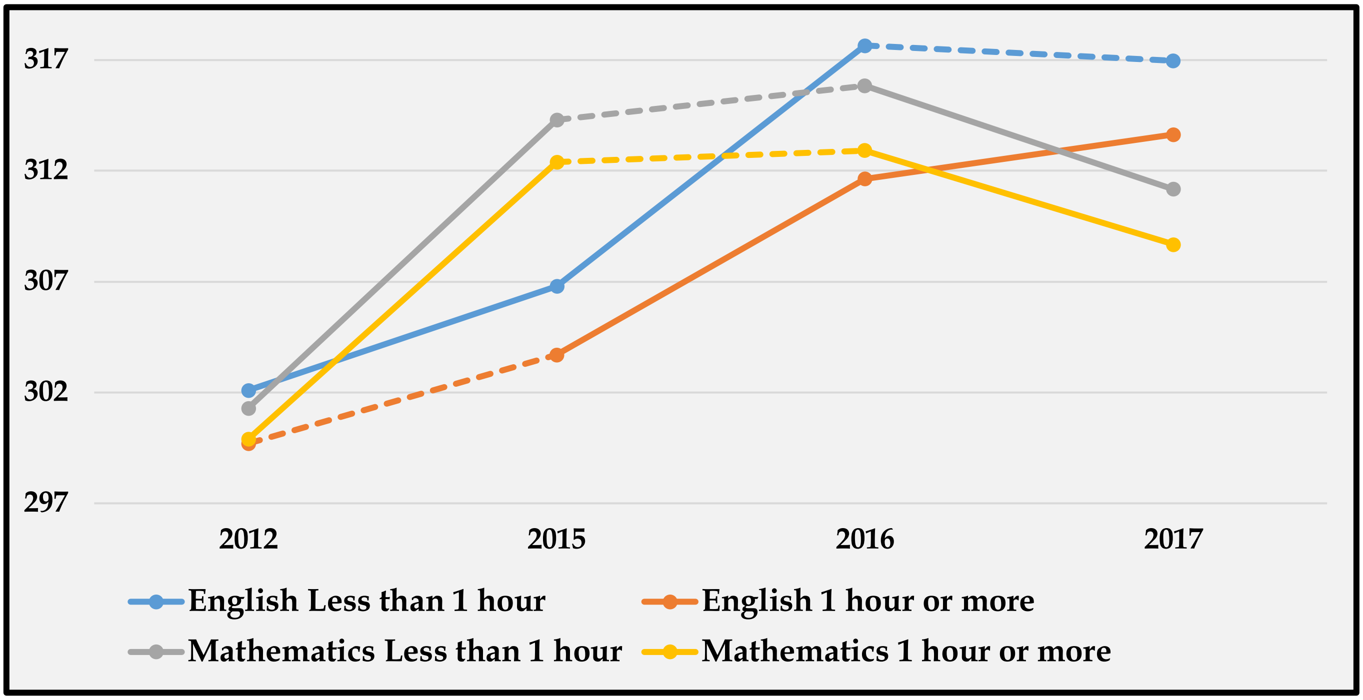

Figure 2.11: Mean performance in English and Mathematics by time per day spent working for the family since 2012

Table 2.16 is a cross-tabulation of proficiency levels and time spend working for the family for 2017. The results show that 69.3% of the learners that worked less than an hour per day performed at or above grade level in English whilst 67.3% of learners that worked for one hour or more per day performed at or above grade level. In Mathematics, 57.2% of learners that worked less than an hour per day performed at or above grade level and 54.6% of those that worked for one hour or more per day performed at or above grade level. These differences could be attributed to the fact that learners who spent less time working for the family have more time to study as compared to those who work for more hours.

Table 2.16: Cross-tabulation of Proficiency level and Time spent working for family for 2017

Proficiency Level	**Less than 1 hour**	**1 hour or more**	**Total**
English			

Above grade level	24.6%(1297)	32.7%(3659)	21.4%(3516)
At grade level	44.7%(2357)	47.5%(5318)	46.6%(7575)
Below grade level	30.7%(1615)	32.7%(3659)	32.0%(5274)
Total	100%(5269)	100%(11196)	100%(16465)
Mathematics			
Above grade level	20.4%(1076)	15.7%(1759)	17.2%(2835)
At grade level	36.8%(1937)	38.8%(4349)	38.2%(6286)
Below grade level	42.8%(2256)	45.4%(5088)	44.6%(7344)
Total	100%(5269)	100%(11196)	100%(16465)

Table 2.17 below shows the differences in learner performance by time spent working for the family in both English and Mathematics. The results presented in Table 2.17 are different from the results presented in Table 2.15 in that the results presented below (Table 2.17) have been further split into four groups. This was done in order to improve variability and comparability. However, these results shown in Table 2.17 are not comparable to results from 2012 to 2015 since they were not split in the same manner.

Table 2.17: Performance in English and Mathematics by time spent per day working for the family for 2016 and 2017

Category	**2016**		**2017**
		English	
Less than 1 hour	317.66(0.36)	⇔	316.97(0.38)
Difference	⇑		⇑
1 hour and more but less than 2 hours	310.84(0.32)	⇑	314.14(0.37)

Difference	⇓		⇔
2 hours and more but less than 3 hours	312.16(0.41)	⇑	314.40(0.47)
Difference	⇔		⇑
3 hours or more	312.93(0.46)	⇔	312.26(0.45)
Mathematics			
Less than 1 hour	315.83(0.28)	⇓	311.18(0.32)
Difference	⇑		⇔
1 hour and more but less than 2 hours	312.28(0.28)	⇓	309.30(0.33)
Difference	⇔		⇔
2 hours and more but less than 3 hours	313.14(0.35)	⇓	308.79(0.41)
Difference	⇔		⇔
3 hours or more	314.15(0.40)	⇓	307.74(0.38)

Where {⇑} *indicate a significant increase,* {⇔} *no change and* {⇓} *significant decrease.*

Table 2.17 shows that learners who worked less than 1 hour for their families outperformed learners who worked for 1 hour and more but less than 2 hours in English and the difference between these two groups was statistically significant. However, there was no significant difference in performance between learners who worked for 1 hour and more but less than 2 hours and learners who worked for 2 hours and more but less than 3 hours in English. The 2017 results further show a significant difference in English performance between learners who worked for 2 hours and more but less than 3 hours and learners who worked for 3 hours or more. For Mathematics, the 2017 results show that there were no significant differences in performance among all the groups.

2.7.7 Meals per day

Learners were asked how many meals per day they usually had. A meal referred to eating meat, vegetables and/or starch. Descriptive statistics (Table 2.1) for 2017 indicate that 10% had one meal per day, 36% had two meals per day and 54% had three or more meals per day. As shown in Table 2.18, learners eating three or more meals per day outperformed learners eating two meals per day in both English and Mathematics in 2012, 2015, 2016 and 2017. The difference in performance between these two groups was statistically significant from 2012 to 2017. The results also indicate no significant difference in English performance between learners eating two meals and learners eating one meal in 2012, 2015 and 2016, but shows a significant difference in 2017. In Mathematics, significant differences in performance between learners eating two meals and learners eating one meal were observed in 2012, 2015 and 2017; no significant difference was recorded in 2016.

Table 2.18: Performance in English and Mathematics by meals per day since 2012

English	**2012**		**2015**		**2016**		**2017**	**2012-2017**
Three or more meals	303.5(1.28)	⇔	307.6(1.11)	⇑	318.43(0.28)	⇔	318.26(0.30)	⇑
Difference	⇑		⇑		⇑		⇑	
Two meals	296.3(1.06)	⇑	301.0(0.81)	⇑	307.57(0.31)	⇑	310.88(0.32)	⇑
Difference	⇔		⇔		⇔		⇑	
One meal	294.8(1.34)	⇔	298.8(1.22)	⇑	308.91(0.57)	⇔	308.94(0.59)	⇑
Mathematics	**2012**		**2015**		**2016**		**2017**	**2012-2017**
Three or more meals	303.3(1.12)	⇑	315.4(0.76)	⇑	316.24(0.23)	⇓	312.51(0.24)	⇑
Difference	⇑		⇑		⇑		⇑	

Two meals	296.9(1.06)	⇑	310.3(0.74)	⇔	310.99(0.29)	⇓	306.46(0.29)	⇑
Difference	⇑		⇑		⇔		⇑	
One meal	293.3(1.58)	⇑	307.3(1.20)	⇑	311.19(0.56)	⇓	303.82(0.52)	⇑

Where {⇑} indicate a significant increase, {⇔} no change and {⇓} significant decrease. Standard errors are reported between brackets.

Across the years, there was no significant difference in English performance between 2012 and 2015 for learners eating three or more meals. The same applies for learners eating one meal. However, learners eating three or more meals and learners eating one meal showed short-term improvements in English between 2015 and 2016 and an insignificant change between 2016 and 2017as shown in Figure 2.12. Learners eating two meals showed long term improvement in English performance between 2012 and 2017. In 2017, learners eating two meals outperformed learners eating one meal by 1.94 score points in English. This difference was small but significant.

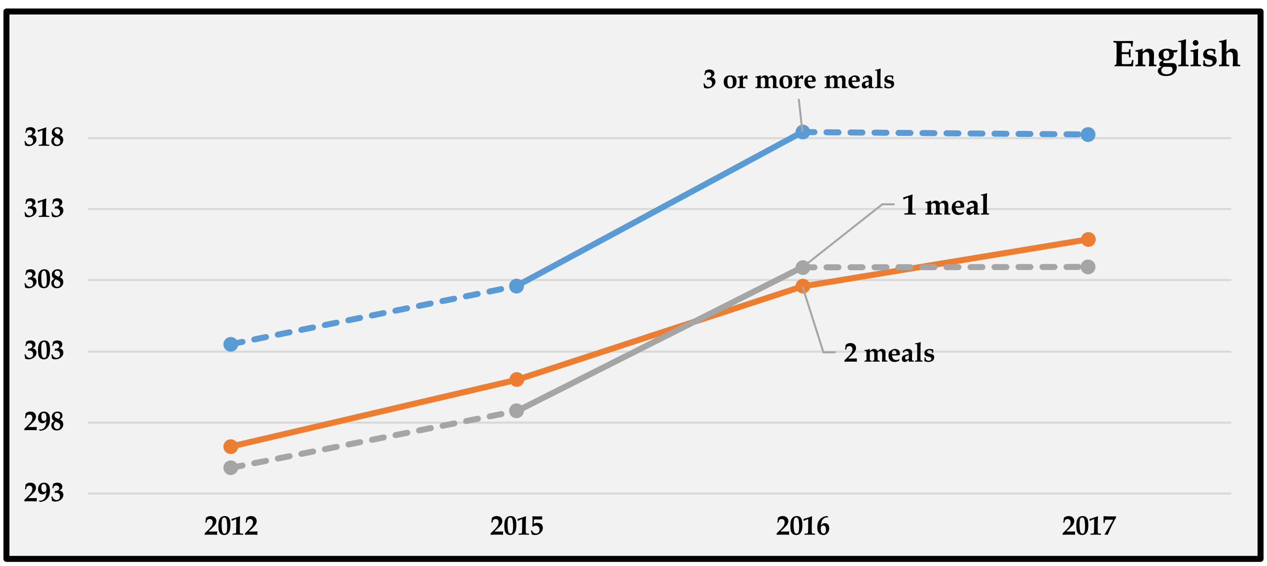

Figure 2.12: Mean performance in English by number of meals per day since 2012

Figure 2.13 shows the mean performance in Mathematics by number of meals per day since 2012. Similar to the results for English above, learners eating three or more meals per day outperformed learners eating two meals in Mathematics in 2012, 2015, 2016 and 2017. The difference between learners eating three or more meals per day and learners eating two meals was moderate and stable over time. Learners eating three or more meals per day and learners eating only one meal per day showed long term improvements from 2012 to 2016 in Mathematics and a short term decrease between 2016 and 2017.

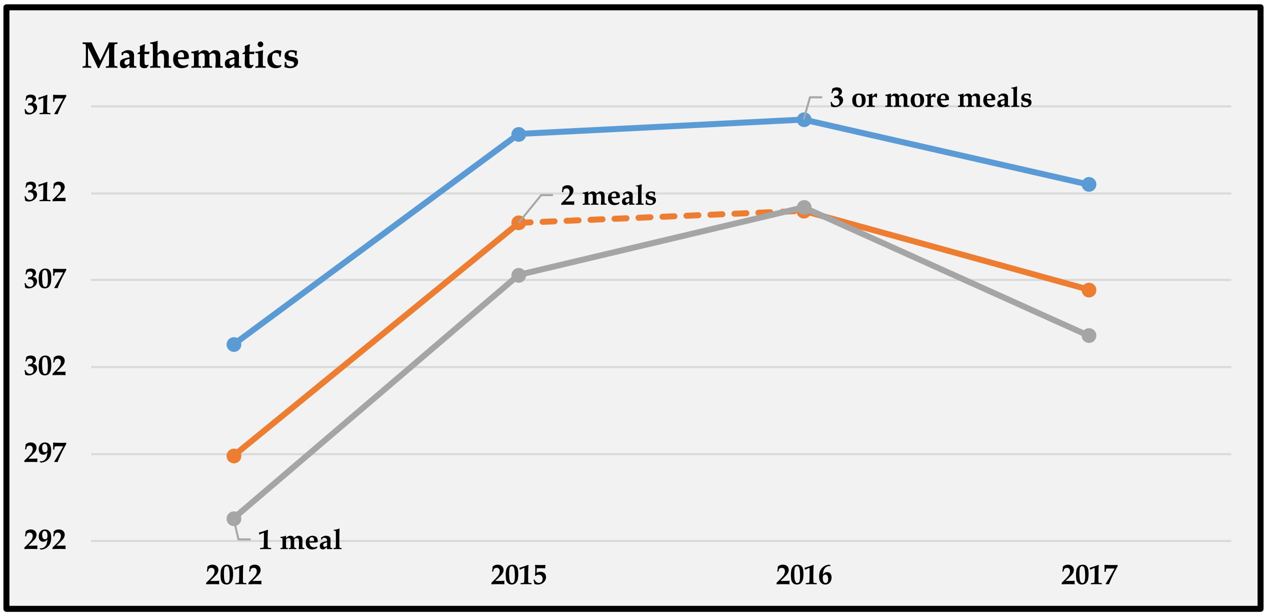

Figure 2.13: Mean performance in Mathematics by number of meals per day since 2012

As shown in Table 2.19, 72.3% of the learners eating 3 or meals performed at or above grade level in English. The percentages of learners performing at or above grade level for learners eating two meals was 63.7% whilst that for learners eating one meal was 59.4%. These results indicate that as the number of meals per day increases, the number of learners performing at or above grade level increases. For Mathematics, the percentages of learners performing at or above grade level for learners eating 3 or more meals was 60.8%, 50.6% for learners eating 2 meals and 43.4% for learners eating one meal.

Table 2.19: Cross-tabulation of Proficiency level and number of meals per day for 2017

Proficiency Level	**One meal**	**Two meals**	**3 or more meals**	**Total**
English				
Above grade level	14.3%(236)	15.6%(912)	26.4%(2368)	21.4%(3516)

At grade level	45.1%(744)	48.1%(2815)	45.9%(4116)	46.6%(7675)
Below grade level	40.6%(670)	36.3%(2122)	27.7%(2482)	32.0%(5274)
Total	100%(1650)	100%(5849)	100%(8966)	100%(16465)
Mathematics				
Above grade level	10.7%(176)	12.5%(730)	21.5%(1929)	17.2%(2835)
At grade level	32.7%(540)	38.1%(2228)	39.2%(3518)	38.2%(6286)
Below grade level	56.6%(934)	49.4%(2891)	39.2%(3519)	44.6%(7344)
Total	100%(1650)	100%(5849)	100%(8966)	100%(16465)

2.7.8 Number of home possessions

Learners were asked which of the following home possessions they had at their home: electricity, piped water, television, borehole and radio. Descriptive statistics were computed on the total number of items, in the list, they had at their home. 6% had none of the items, 31% had one, 30% had two, 19% had three, whilst 14% had four or more home possessions. Results with combined groups are shown in Table 2.20 and results with split groups are shown in Table 2.22. In 2017, learners with four or more home possessions outperformed those with two or three home possessions who in-turn outperformed learners with one or less home possessions in English as shown Table 2.20. The differences between the groups are significant as shown by the arrows. In Mathematics, the same trend is observed for all three groups.

Table 2.20: Performance in English and Mathematics by number of home possessions since 2012

English	**2012**		**2015**		**2016**		**2017**	**2012-2017**
Four or more	316.6(2.32)	⇔	320.4(1.71)	⇑	330.70(0.51)	⇓	327.77(0.68)	⇑
Difference	⇑		⇑		⇑		⇑	

Two or three	298.8(0.92)	⇔	301.4(0.84)	⇑	311.23(0.29)	⇑	314.08(0.29)	⇑
Difference	⇑		⇔		⇑		⇑	
One or less	294.4(1.02)	⇑	300.3(0.83)	⇑	307.45(0.28)	⇑	310.66(0.31)	⇑
Mathematics	**2012**		**2015**		**2016**		**2017**	**2012-2017**
Four or more	314.2(1.98)	⇑	323.5(1.25)	⇔	321.19(0.40)	⇓	318.08(0.52)	⇔
Difference	⇑		⇑		⇑		⇑	
Two or three	299.5(0.92)	⇑	310.4(0.68)	⇑	312.83(0.25)	⇓	309.42(0.25)	⇑
Difference	⇑		⇔		⇔		⇑	
One or less	294.3(0.99)	⇑	309.9(0.67)	⇔	311.25(0.28)	⇓	306.38(0.26)	⇑

Where {⇑} indicate a significant increase, {⇔} no change and {⇓} significant decrease. Standard errors are reported between brackets.

The difference in English performance between learners with four or more home possessions and learners with two or three possessions was consistently large across all the assessment years and shown in Figure 2.14. On the other hand, the difference in English performance between learners with two or three possessions and learners with one or less possession was small. Learners with one or less possession at home showed a long term significant improvement in English between 2012 and 2017. In comparison, other groups showed short-term improvement between 2015 and 2017 in English performance.

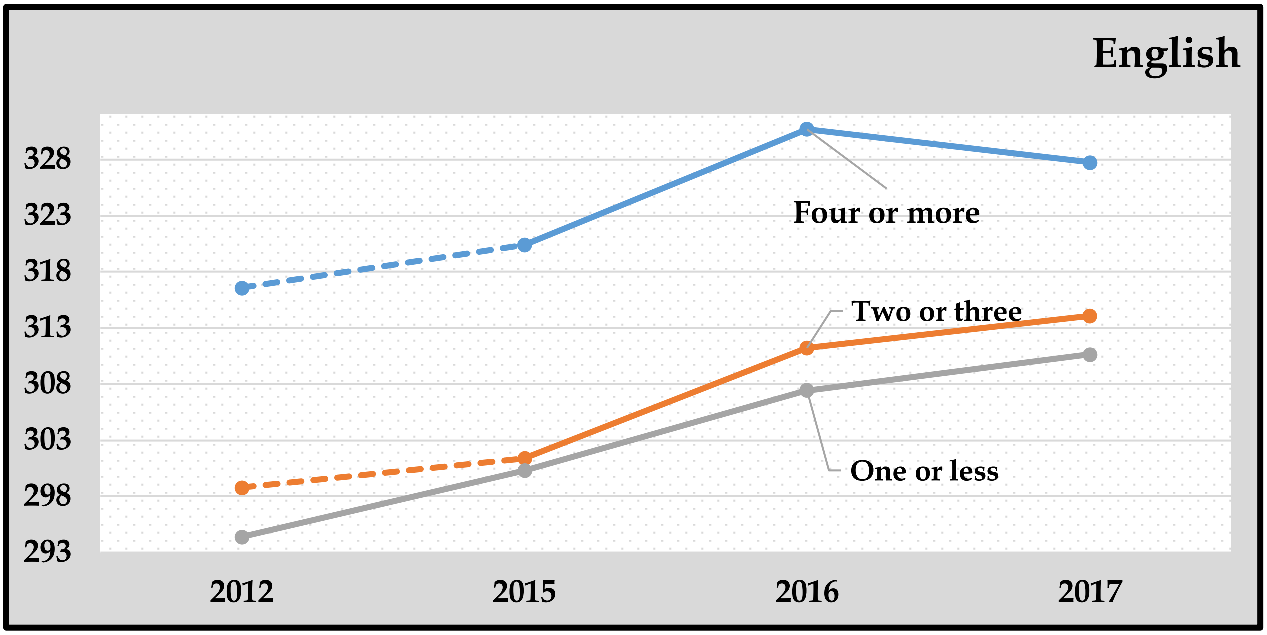

Figure 2.14: Mean performance in English by number of home possessions since 2012

For Mathematics, learners with two or three home possessions showed long-term improvement between 2012 and 2016. However, a significant decrease was observed from 2016 to 2017. The other groups showed significant improvement in performance between 2012 and 2015 only as shown in Figure 2.15 below but decreased significantly in performance from 2016 to 2017.

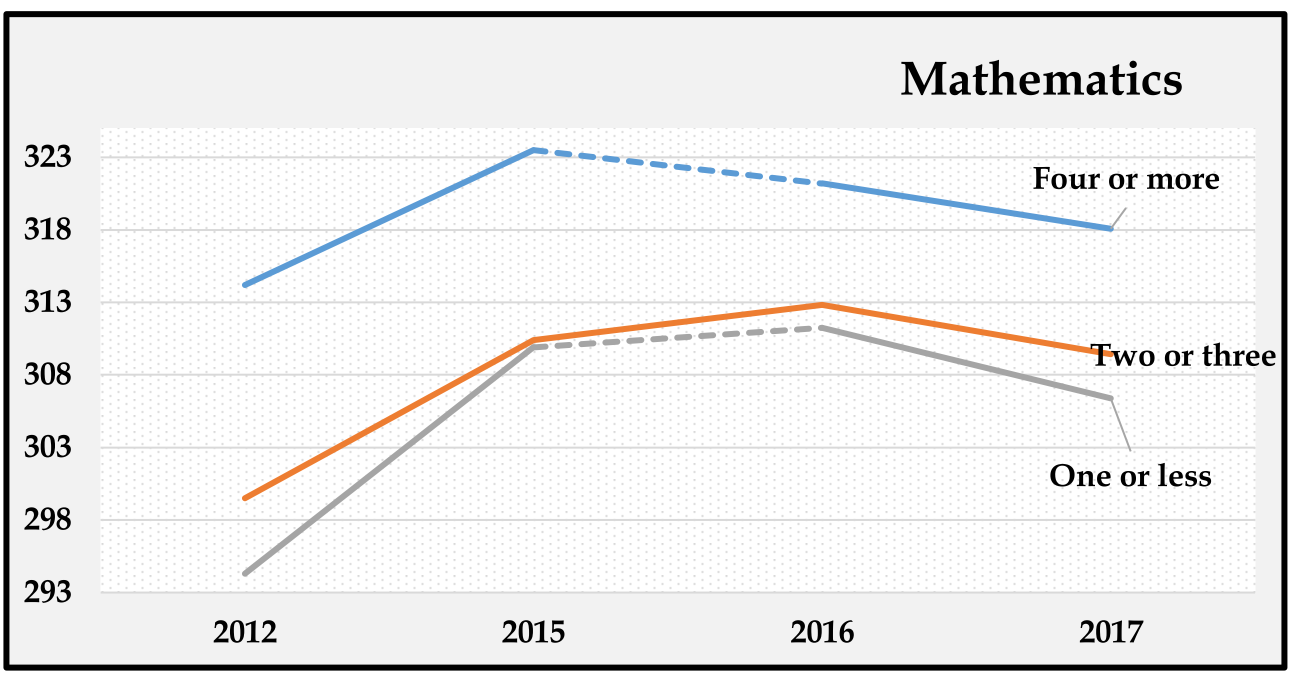

Figure 2.15: Mean performance in Mathematics by number of home possessions since 2012

Table 2.21 is a cross-tabulation of proficiency levels and number of home possessions for 2017. The majority (79.1%) of learners with four or more home possessions performed at or above grade level in English and 69.1% of learners with four or more home possessions in Mathematics. Learners with a higher number of home possessions outperformed those with a lower number of home possessions. This is true for all groups as there are 36.3%, 31.9% and 20.9% of learners below grade level for one or less, two or three and four or more home possessions groups respectively in English and 50.1%, 44.3% and 30.9% for one or less, two or three and four or more home possessions groups in Mathematics respectively. The percentage of learners within the below grade level decreases as the number of home possessions increases.

Table 2.21: Cross-tabulation of Proficiency level and number of home possessions for 2017

Proficiency Level	**One or less**	**Two or three**	**Four or more**	**Total**
English				
Above grade level	15.9%(970)	19.9%(1610)	41.1%(936)	21.4%(3516)
At grade level	47.9%(2927)	48.1%(3883)	38.0%(865)	46.6%(7675)
Below grade level	36.3%(2218)	31.9%(2579)	20.9%(477)	32.0%(5274)
Total	100%(6115)	100%(8072)	100%(2278)	100%(16465)
Mathematics Above grade level	12.8%(784)	16.4%(1321)	32.0%(730)	17.2%(2835)
At grade level	37.1%(2270)	39.3%(3173)	37%(843)	38.2%(6286)
Below grade level	50.1%(3061)	44.3%(3578)	30.9%(705)	44.6%(7344)

Total	100%(6115)	100%(8072)	100%(2278)	100%(16465)

Table 2.22 below is similar to Table 2.20 above. The only difference is that in 2016, learners with none of the home possessions were separated from the one or less group as shown in Table 2.22. Also, learners with two home possessions were separated from the two or three group. This was done to improve comparability among individual groups. However, splitting the groups this way rendered the results in Table 2.22 incomparable to the previous years' results because the groups are different.

Results in Table 2.22 indicate that learners with four or more home possessions (electricity, piped water, television, borehole and radio) outperformed learners with any three of the home possessions and the difference was statistically significant in both English and Mathematics. In turn, learners with three home possessions outperformed learners with two home possessions and the difference was statistically significant. There was however no significant difference in performance between learners with two and learners with one home possessions in 2017 as was the case in 2016. Learners with one home possession significantly outperformed learners with none. The results of English performance have a similar pattern to that of Mathematics performance.

Table 2.22: Performance in English and Mathematics by number of home possessions for 2016 and 2017

Category	**2016**		**2017**
English			
None	304.19(0.53)	⇓	302.93(0.66)
Difference	⇓		⇓
One	308.29(0.29)	⇑	312.11(0.34)
Difference	⇔		⇔
Two	308.05(0.33)	⇑	311.55(0.34)

Difference	⇓		⇓
Three	314.73(0.42)	⇑	317.94(0.49)
Difference	⇓		⇓
Four or more	330.70(0.48)	⇓	328.24(0.74)
Mathematics			
None	308.73(0.58)	⇓	299.34(0.66)
Difference	⇓		⇓
One	311.93(0.29)	⇓	307.70(0.30)
Difference	⇔		⇔
Two	311.60(0.33)	⇓	307.62(0.32)
Difference	⇓		⇓
Three	314.18(0.34)	⇓	312.17(0.40)
Difference	⇓		⇓
Four or more	321.19(0.35)	⇓	318.77(0.56)

Where {⇑} indicate a significant increase, {⇔} no change and {⇓} significant decrease.

2.7.9 Number of home educational resources

Learners were asked which of the following home educational resources they had at their home; pencil, school bag, pen, desk, computer and calculator. Descriptive statistics were computed on the total number of items in the list they had at their home. 1% of the learners had none, 19% had one, 19% had two, 35% had three, 26% to six home educational resources. Learners were classified into three groups, which are: One or less, Two or three and Four or more.

Table 2.23: Performance in English and Mathematics by number of home educational resources since 2012

English	**2012**		**2015**		**2016**		**2017**	**2012-2017**
Four or more	315.7(2.38)	⇔	316.8(1.83)	⇑	323.36(0.38)	⇑	324.84(0.47)	⇑
Difference	⇑		⇑		⇑		⇑	
Two or three	303.3(1.10)	⇔	303.1(0.88)	⇑	308.87(0.25)	⇑	310.97(0.25)	⇑
Difference	⇑		⇑		⇔		⇔	
One or less	292.9(1.02)	⇑	298.7(0.79)	⇑	307.69(0.42)	⇑	311.37(0.43)	⇑
Mathematics	**2012**		**2015**		**2016**		2017	**2012-2017**
Four or more	313.1(1.83)	⇑	321.4(1.12)	⇓	318.38(0.30)	⇓	316.24(0.37)	⇔
Difference	⇑		⇑		⇑		⇑	
Two or three	303.6(1.12)	⇑	312.0(0.72)	⇔	311.79(0.24)	⇓	307.26(0.23)	⇑
Difference	⇑		⇑		⇔		⇔	
One or less	293.0(1.02)	⇑	308.1(0.67)	⇑	310.79(0.41)	⇓	306.58(0.39)	⇑

Where {⇑} indicate a significant increase, {⇔} no change and {⇓} significant decrease. Standard errors are reported between brackets.

As shown in Table 2.23, there has been a significant improvement in English performance for all the three groups between 2012 and 2017. In 2017, learners possessing four or more home educational resources had a significantly higher mean performance than learners with two or three educational resources in both English and Mathematics. However, there were no significant differences in English and Mathematics performance between learners possessing two or three home educational resources and learners possessing one or less home educational resources in 2017. The same trends were observed in 2016. In Mathematics, there were significant decreases in performance for all groups from 2016 to

2017. All the groups improved significantly in Mathematics between 2012 and 2017 except for the group possessing four or more home educational resources.

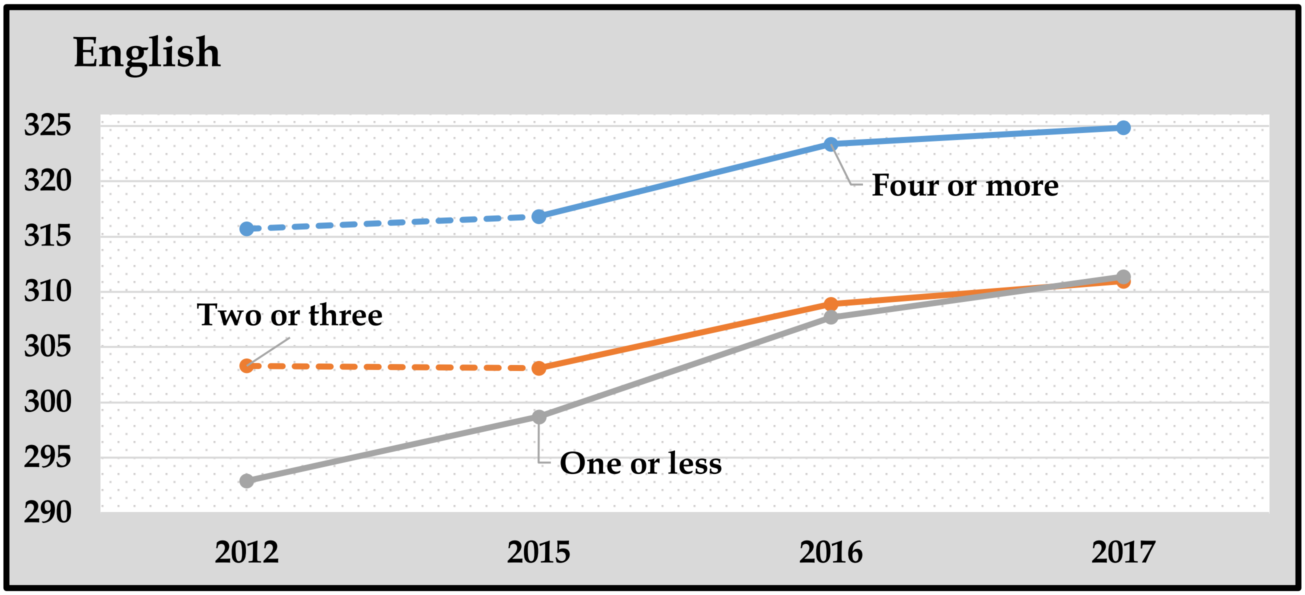

Figure 2.16: Mean performance in English by number of home educational resources since 2012

Figure 2.16 above is a line graph showing mean performance in English by number of home educational resources since 2012. The pattern of findings shown for the number of home educational resources is somewhat similar to that of the number of home possessions shown in subsection 2.7.8 above. Learners possessing one or less home educational resources showed a long term improvement in English performance between 2012 and 2017. In 2012, these learners had mean score of 292.9, which increased significantly to 298.7 in 2015, then to 307.69 in 2016 and finally increased to 311.37 in 2017. The other groups experienced medium term (two years) improvement from 2015 to 2017. Figure 2.17 is showing the mean performance in Mathematics by number of home educational resources since 2012. Learners possessing four or more of home educational resources performed better than the other groups. The difference in performance appeared to be decreasing with time.

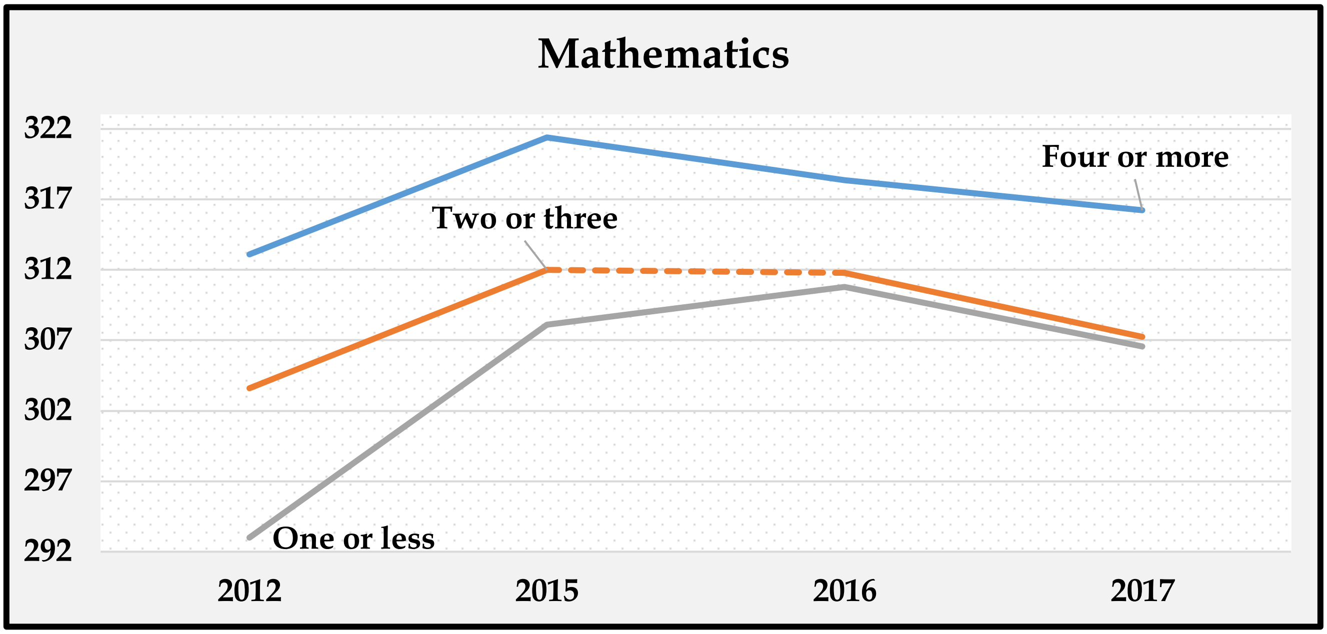

Figure 2.17: Mean performance in Mathematics by number of home educational resources since 2012

The proficiency levels for the number of home educational resources for 2016 are shown in Table 2.24. For both English and Mathematics, the results indicate that as the number of home educational resources per learner increases, the percentage of students performing at or above grade level also increases. Put differently, as the number of home educational resources per learner increases, the percentage of students performing below grade level decreases.

Table 2.24: Cross-tabulation of Proficiency level and number of home educational resources for 2017

Proficiency Level	**One or less**	**Two or three**	**Four or more**	**Total**
English				
Above grade level	17.3%(572)	15.9%(1401)	35.6%(1543)	21.4%(3516)
At grade level	46.5%(1535)	48.7%(4296)	42.5%(1844)	46.6%(7675)
Below grade level	36.2%(1197)	35.4%(3124)	22.0%(935)	32.0%(5274)

Total	100%(3304)	100%(8821)	100%(4340)	100%(16465)
Mathematics				
Above grade level	13.9%(460)	13.0%(1150)	28.2%(1225)	17.2%(2835)
At grade level	36.3%(1201)	39%(3443)	37.8%(1642)	38.2%(6286)
Below grade level	49.7%(1643)	47.9%(4228)	33.9%(1473)	44.6%(7344)
Total	100%(3304)	100%(8821)	100%(4340)	100%(16465)

In Table 2.24, learners with four or more educational resources had the highest percentage of learners performing above grade level with 35.6% and 28.2% in English and Mathematics respectively. Learners with higher home educational resources outperformed those with lower home educational resources. The obvious reason for this difference is that learners with higher home educational resources have an opportunity to use those resources for study purposes at home than those without.

2.7.10 Highest parental education

Learners were asked to record the highest level of education completed by each of their parents or guardians. The variable used for the analysis was the higher education of the two parents or guardians. As shown in Table 2.25, learners with a parent or guardian who completed a tertiary education outperformed learners with a parent or guardian who completed secondary school in both English and Mathematics in 2012, 2015, 2016 and 2017. In 2017, the mean score for learners with a parent or guardian who completed a tertiary education was 328.47 in English while the corresponding score for learners with a parent or guardian who completed secondary school was 313.03. The difference was large and statistically significant, but appeared to be decreasing over time. Overall, all the groups except one (learners in English with a parent or guardian who completed a tertiary education) experienced significant increases in both English and Mathematics performance between 2012 and 2017. It is important to note that learners from all groups experienced a significant decrease in Mathematics performance between 2016 and 2017.

Table 2.25: Performance in English and Mathematics by highest parental education since 2012

English	**2012**		**2015**		**2016**		**2017**	**2012-2017**
Completed a tertiary course	325.8(2.93)	⇔	322.3(2.16)	⇑	327.98(0.62)	⇔	328.47(0.63)	⇔
Difference	⇑		⇑		⇑		⇑	
Completed secondary school	300.5(0.94)	⇔	303.8(0.82)	⇑	314.20(0.28)	⇓	313.03(0.23)	⇑
Difference	⇑		⇑		⇑		⇑	
Completed primary school	296.0(1.02)	⇔	298.2(0.88)	⇑	308.13(0.33)	⇔	308.02(0.47)	⇑
Difference	⇑		⇔		⇑		⇑	
Did not go to school	293.2(1.52)	⇔	296.0(1.32)	⇑	305.81(0.63)	⇔	304.55(1.03)	⇑
Mathematics	**2012**		**2015**		**2016**		2017	**2012-2017**
Completed a tertiary course	321.4(2.02)	⇔	326.1(1.40)	⇓	321.81(0.48)	⇓	318.56(0.48)	⇑
Difference	⇑		⇑		⇑		⇑	
Completed secondary school	301.0(0.90)	⇑	312.8(0.66)	⇑	314.23(0.25)	⇓	308.67(0.21)	⇑
Difference	⇑		⇑		⇑		⇑	
Completed primary school	296.3(1.13)	⇑	307.8(0.66)	⇑	311.17(0.32)	⇓	304.33(0.43)	⇑
Difference	⇑		⇑		⇑		⇑	

Did not complete a school	292.7(1.67)	⇑	305.0(1.30)	⇑	308.43(0.64)	⇓	299.2(1.02)	⇑

Where {⇑} indicate a significant increase, {⇔} no change and {⇓} significant decrease. Standard errors are reported between brackets.

For all the groups, Figure 2.18 shows that there were no significant changes in English performance between 2012 and 2015. However, all groups improved significantly between 2015 and 2016 as shown by the solid lines. Between 2016 and 2017, only learners with a parent or guardian who completed secondary education decreased significantly, whilst the rest of the groups remained stable. Figure 2.18 is also showing a positive correlation between learners' performance and highest parental education.

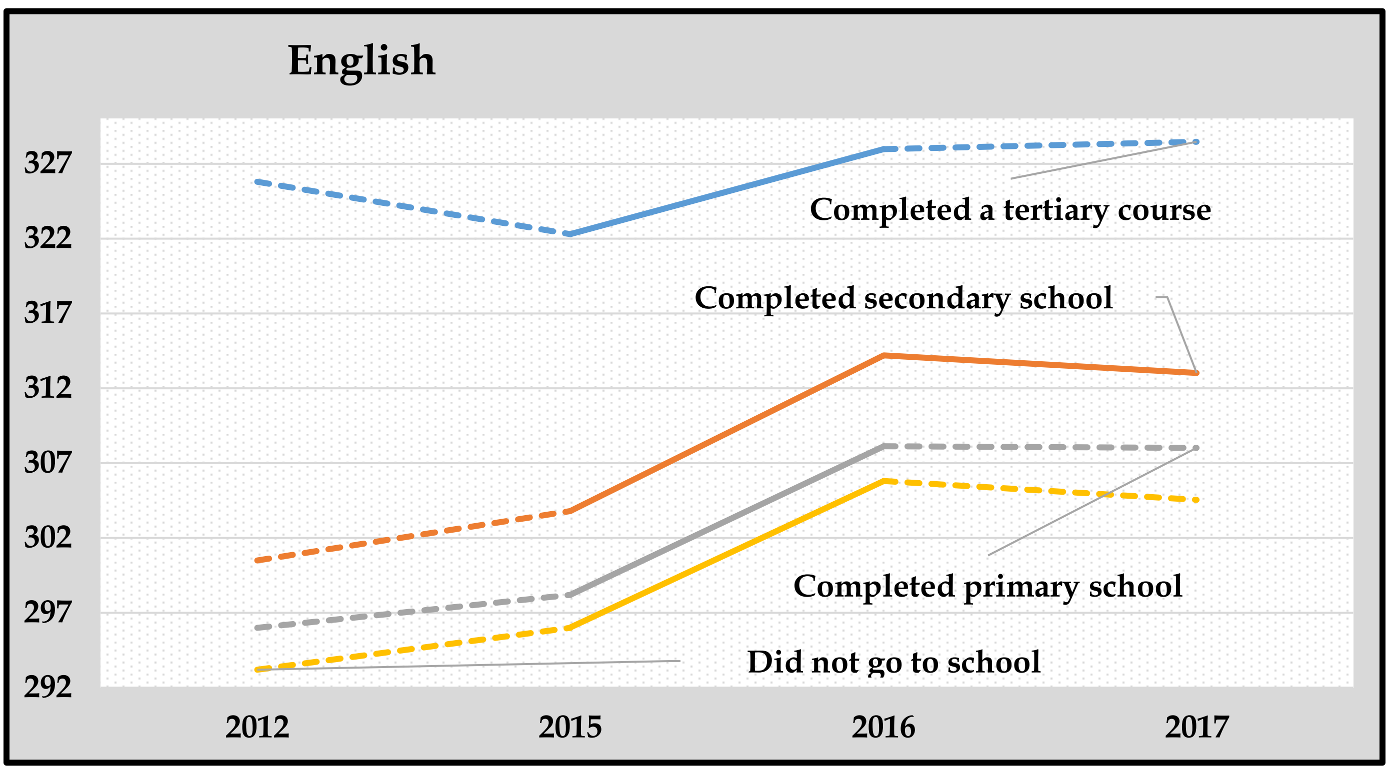

Figure 2.18: Mean performance in English by highest parental education since 2012

As shown in Figure 2.19, learners with a parent or guardian who completed a tertiary education outperformed all other groups in Mathematics. The difference was large between learners with parents who completed a tertiary course and learners with parents who completed secondary school. This difference appeared to be decreasing over time. Learners with parents who completed secondary school, learners with parents who completed primary school and learners with parents who did not go to school showed long term improvement in Mathematics between 2012 and 2016 but decreased significantly between 2016 and 2017.

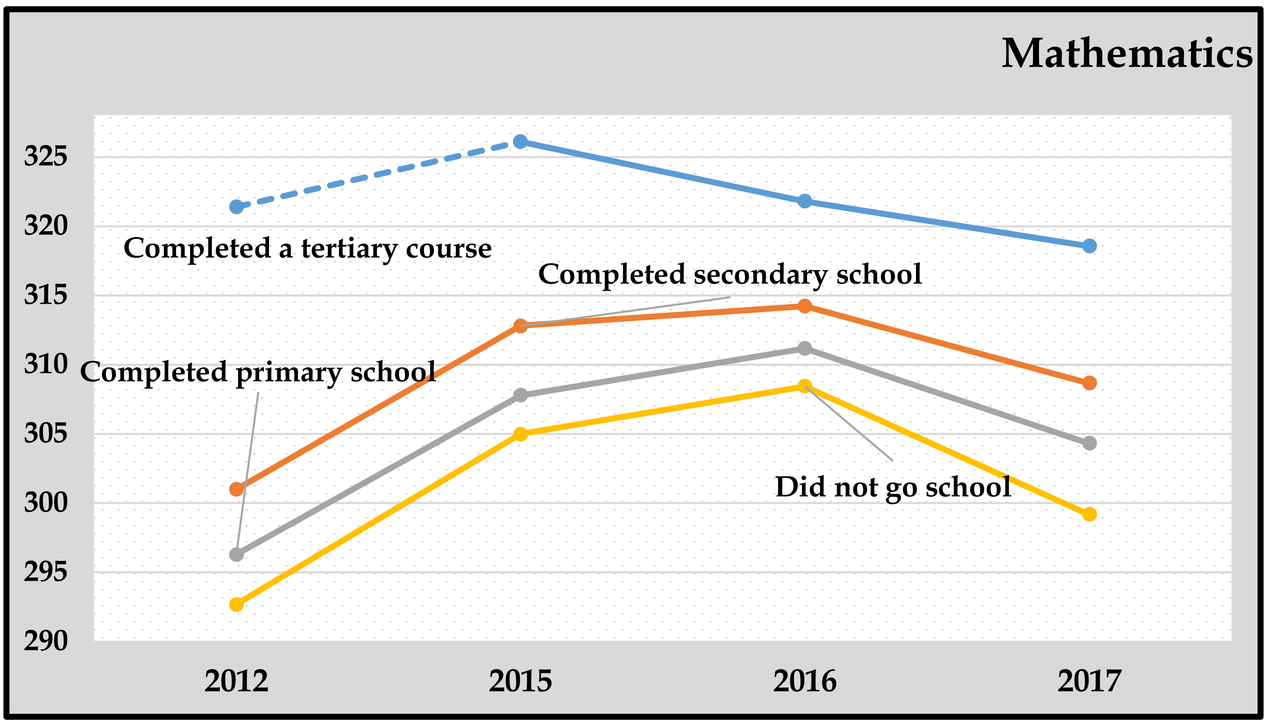

Figure 2.19: Mean performance in English by highest parental education since 2012

2.8 Learner Performance in Shona, Ndebele and Tonga in 2017

Schools and learners were given the opportunity to select an African language test to respond to among Shona, Ndebele and Tonga. In 2017, 73% responded to the Shona test, 17% responded to the Ndebele test, 2% responded to the Tonga test whilst 8% did not respond to any African language test. No weights were applied in analysing these language tests since these tests were self-selected by the schools and learners. In addition, these results are also not comparable over time meaning no comparable analysis were done from all the assessment years but just for 2017.

Table 2.26: Mean performance of learners responding to Shona, Ndebele and Tonga tests

Variable	**Options**	**Shona**	**Ndebele**	**Tonga**
Gender	Boy	297.97	299.12	299.85
	Girl	302.68	301.12	300.12
School type	Registered	301.05	300.18	300.10
	Satellite	294.78	299.08	299.49
Location	Urban	310.07	302.64	299.54
	Rural	298.43	299.61	300.07
Province	Bulawayo		311.59	
	Harare	313.87		
	Manicaland	299.55		
	Mashonaland Central	297.40		
	Mashonaland East	302.13		
	Mashonaland West	294.83		299.97
	Masvingo	299.07		
	Matabeleland North		299.50	299.94
	Matabeleland South		297.84	
	Midlands	301.34	299.76	

The mean performance of learners that responded to the Shona, Ndebele and Tonga tests for 2017 are recorded in Table 2.26 for each of the subgroups of gender, school type, school location and province. Girls performed better than boys in both Shona, Ndebele and Tonga. The differences in mean performance were very small in all the three indigenous languages. Learners learning at registered schools performed better than those at satellite schools in all languages. The difference in the mean performance was moderate in Shona but very small in Ndebele and Tonga. Learners from urban schools outperformed those from rural areas in Shona and Ndebele as shown in Table 2.26 with moderate difference between urban and rural learners in Shona and small difference in Ndebele. However, in Tonga, learners from rural areas outperformed those from urban areas and this difference was very small. Harare, Bulawayo and Mashonaland West provinces were the best performers in Shona, Ndebele and Tonga tests respectively. Mashonaland West, Matabeleland South and Matabeleland North performed the worst in Shona, Ndebele and Tonga tests respectively.

CHAPTER 3
SOCIO-ECONOMIC EQUITY IN EDUCATION IN ZIMBABWE

Equity in education means that personal or social circumstances such as gender, location, ethnic origin or family background, are not obstacles to achieving educational potential (Fairness) and that all individuals reach at least a basic minimum level of skills (inclusion). In these education systems, the vast majority of students have the opportunity to attain high level skills, regardless of their own personal and socio-economic circumstances. According to OECD (2013b), the highest performing education systems are those that combine equity with quality and they give all children opportunities for a good quality education.

In analysing the ZELA 2017 results, we explore how Zimbabwe is providing education opportunities and achieving educational outcomes, which are an indication of equity in society as a whole. The index of Socio-Economic Status (SES) was estimated for each student from highest parental education, number of books at home, number of home possessions (electricity, piped water, borehole, television and radio), number of meals per day and number of home educational resources. Students were classified into three main categories (High SES, Medium SES and Low SES) depending on these five components. The rationale for using these five components was that socio-economic status is usually based on education, occupational status and income.

3.1 Performance and Socio-economic status

One instinctive way to analyse the relationship between learners' performance and SES is to estimate the percentage of learners achieving at, above and below grade level of SES. Figure 3.1 below is a bar graph showing percentages of learners below, at and above grade level for English by SES in 2012, 2015, 2016 and 2017. In 2012, 2% of the learners in the Low SES category achieved above grade level while 5% in the Low SES category achieved above grade level in 2015. In 2016 and 2017, the percentage of learners in the Low SES category achieving above grade level rose to 6% and 12% respectively. The results are similar for Medium SES and High SES categories for English performance. These results indicate that there is general improvement in performance between 2012 and 2017 for learners in all SES groups. The results also show a widening gap in performance between learners from low SES and learners from high SES.

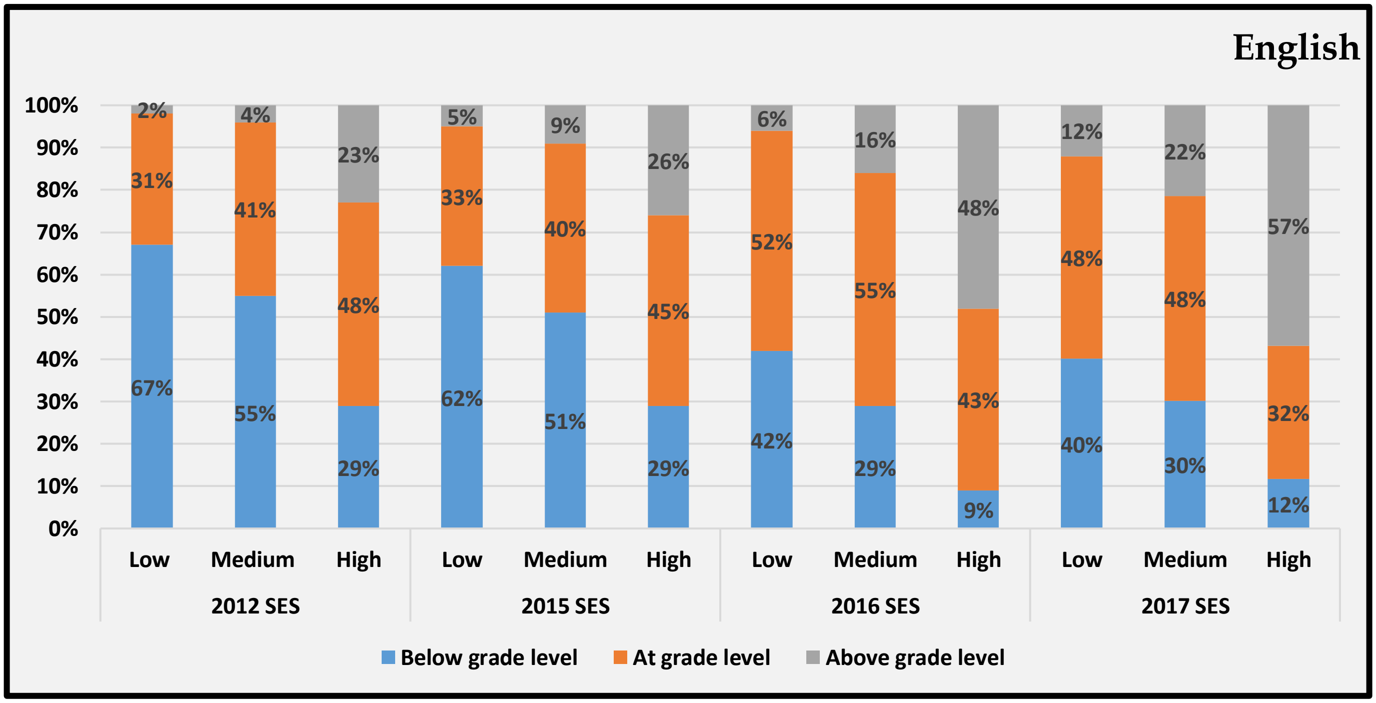

Figure 3.1: Percentage of learners below, at and above grade level for English by SES in 2012, 2015, 2016 and 2017

The percentage of learners achieving at or above grade level increases with increasing SES and the percentage of learners achieving below grade level decreases with increasing SES in both English and Mathematics. Figure 3.2 shows the percentage of learners below, at and above grade level for Mathematics by SES in 2012, 2015, 2016 and 2017. These Mathematics results portray a similar pattern to those of English. For Mathematics, the percentage of learners performing below grade level in 2016 was 46% in the Low SES group, 35% in the medium SES group and 17% in the High SES group. In 2017, the percentage of learners performing below grade level rose to 55% for low SES while the percentage of learners performing below grade level for medium SES and High SES were 42% and 19% respectively. These findings show inequity in education in Zimbabwe, since most of the good performers are from the high SES category.

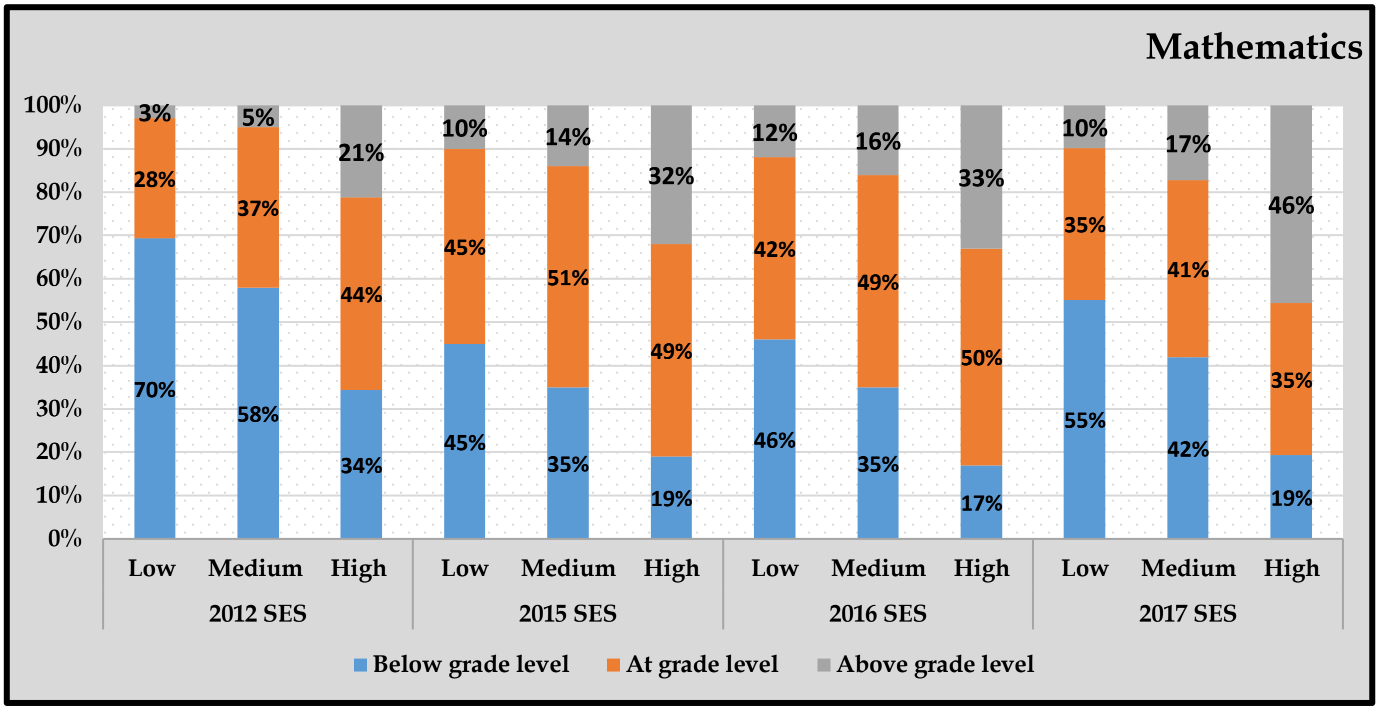

Figure 3.2: Percentage of learners below, at and above grade level for Mathematics by SES in 2012, 2015, 2016 and 2017.

3.2 Socio-economic equity since 2012

Comparison of equity levels between assessments was done through comparisons of mean performance scores of SES groups. There has been a positive trend in learners' performance since 2012 in both English and Mathematics as shown in Table 3.1. Although the ZELA 2017 results indicate a significant improvement in performance across the years, socio-economic status (SES) is still a strong predictor of performance and is associated with large differences in performance. Results shown in Table 3.1 below indicate that on average, learners with High SES outperform those with medium SES who in-turn outperform learners with low SES.

Table 3.1: Performance in English and Mathematics by socio-economic equity in 2012, 2015, 2016 and 2017

English	2012		2015		2016		2017	2012-2017

Low SES	290.4(0.84)	⇑	296.1(0.84)	⇑	303.58(0.31)	⇑	307.97(0.29)	⇑
Difference	⇓		⇓		⇓		⇓	
Medium SES	296.7(0.77)	⇑	301.4(0.76)	⇑	311.37(0.25)	⇑	315.02(0.27)	⇑
Difference	⇓		⇓		⇓		⇓	
High SES	313.5(1.83)	⇔	316.2(1.44)	⇑	332.94(0.49)	⇑	339.26(0.87)	⇑
Mathematics	**2012**		**2015**		**2016**		**2017**	**2012-2017**
Low SES	290.4(0.98)	⇑	306.1(0.74)	⇑	309.09(0.33)	⇓	304.11(0.27)	⇑
Difference	⇓		⇓		⇓		⇓	
Medium SES	297.6(0.79)	⇑	310.9(0.6)	⇑	312.84(0.23)	⇓	310.27(0.23)	⇑
Difference	⇓		⇓		⇓		⇓	
High SES	312.1(1.52)	⇑	321.7(0.95)	⇔	322.97(0.38)	⇑	325.88(0.65)	⇑

Where {⇑} indicate a significant increase, {⇔} no change and {⇓} significant decrease. Standard errors are reported between brackets.

For 2017, students from low socio-economic status (Low SES) had a mean performance of 307.97 score points, whilst those from medium socio-economic status (Medium SES) and high socio-economic status (High SES) had 315.02 and 339.26 score points respectively in English. For Mathematics, students from Low SES had a mean of 304.11, those from medium SES had 310.27 and those from High SES had a mean of 325.88 score points. These statistically significant differences suggest that learners' personal or social circumstances are obstacles to achieving their educational potential. The results indicate lack of fairness and lack of inclusion. Performance differences between socio-economically advantaged and disadvantaged learners indicate the degree to which an education system is equitable and disparities in education based on socio-economic status can create a significant drag on economic growth and development. Table 3.2 below is a cross tabulation for proficiency levels and socio-economic status for 2017.

Table 3.2: Cross-tabulation of Proficiency level and socio-economic status for 2017

Proficiency Level	**Low SES**	**Medium SES**	**High SES**	**Total**
English				
Above grade level	12%(704)	21.5%(1965)	57%(847)	21.4%(3516)
At grade level	47.9%(2801)	48.3%(4404)	31.6%(470)	46.6%(7675)
Below grade level	40.1%(2346)	30.2%(2758)	11.7%(170)	32.0%(5274)
Total	100%(5851)	100%(9127)	100%(1487)	100%(16465)
Mathematics				
Above grade level	9.9%(582)	17.3%(1576)	45.5%(677)	17.2%(2835)
At grade level	34.9%(2042)	40.8%(3721)	35.2%(523)	38.2%(6286)
Below grade level	55.2%(3227)	42.0%(3830)	19.3%(287)	44.6%(7344)
Total	100%(5851)	100%(9127)	100%(1487)	100%(16465)

For English, results in Table 3.2 show that 59.9% of the students from low SES achieved at or above grade level, whilst 69.8% of the students from medium SES achieved at or above grade level. 88.6% of students from high SES achieved at or above the grade level. This means the percentage of learners achieving at or above grade level increases with increasing SES and the percentage of achieving below grade level decreases with increasing SES. Although the performance in English was higher than that of Mathematics in 2017, both subjects have a similar pattern or trend. For Mathematics, the results are showing that 44.8% of the students from low SES achieved at or above grade level whilst 58% from medium SES and 55.4% from high SES achieved at or above the grade level. The results presented in this chapter indicate an improvement in learners' performance and existence of inequity in education in both English and Mathematics between 2012 and 2017. What is clearer is the increase in performance with increasing socio-economic status.

3.3 Differences between and within schools

A different method for analysing socio-economic equity is to focus on the degree in which schools vary from each other in performance, relative to the degree in which learners vary from each other within schools and to relate these disparities with SES at the school and learner levels. Average performance differs between educational systems or countries. Similarly, the performance scores of individual learners within an educational system differ from the average. In some educational systems, these differences between learners are larger than in other ones. A mathematical way to describe this amount of dispersion or variation is the variance. Both the average and variance in performance differ between educational systems and can change over time. In a similar way, schools differ from each other in average performance and learners perform differently from each other within each school. The balance of these two forms of variation differs between educational systems. In some countries, schools are on average quite similar to each other in performance but learners within those schools vary considerably. In other words, the total variance can be delineated into between-school variance and within-school variance so that the sum of the between-school variance and the within-school variance is equal to the total variance.

In Zimbabwe, the total variance was 632.16 in English performance in 2017, where the between school variance was 34% and the within school variance, 66%. From 2012 to 2017, there was a decrease in the between school variance from 37% to 33%. However, for the within school variance, it increased from 59% in 2012 to 66% in 2017. From 2015 to 2016, the between school variance decreased from 47% to 34% whilst the within school variance increased from 53% to 66%. In 2012, 2015 and 2016, the unexplained variance was larger than the explained variance. In 2017, the same trend is observed as the unexplained variance is larger in both between school and within school variances as shown in Figure 3.3 below.

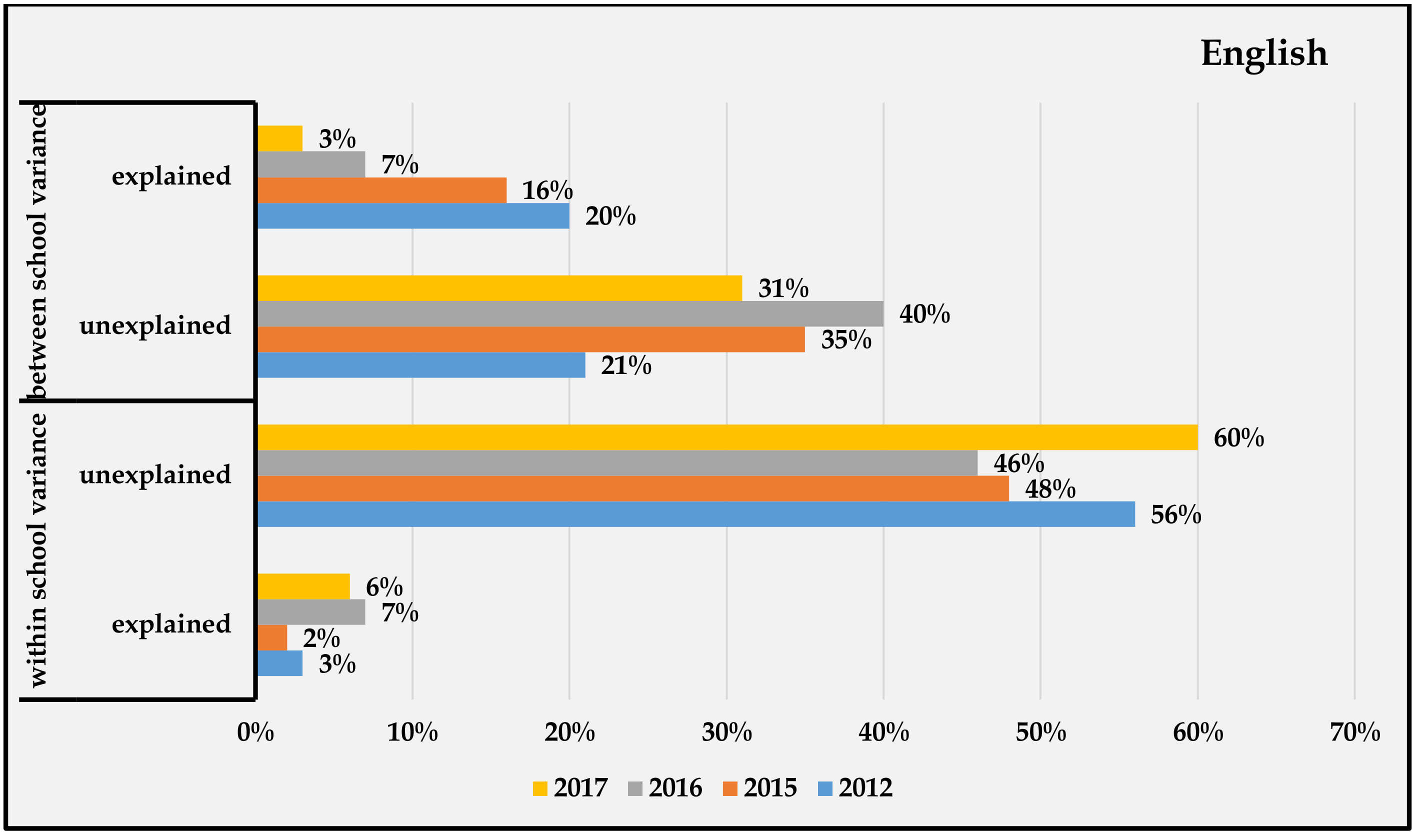

Figure 3.3: Between and within school variance in English performance, explained and unexplained by SES in 2012, 2015, 2016 and 2017

For Mathematics performance, in 2017, the total variance was 430.91 where the between school variance was 39% and the within school variance 61%. From 2012 to 2017, there was an increase in the between school variance from 35% to 39%. However, for the within school variance, it decreased slightly from 65% in 2012 to 61% in 2017. From 2016 to 2017, the between school variance increased slightly from 38% to 39% whilst the within school variance decreased slightly from 62% to 61%. In 2012, 2016 and 2015, the unexplained variance was larger than the explained variance. In 2017, the same trend was observed as the unexplained variance was larger in the within school variance. However, for the between school variance, the explained variance was larger than the unexplained variance for 2017.

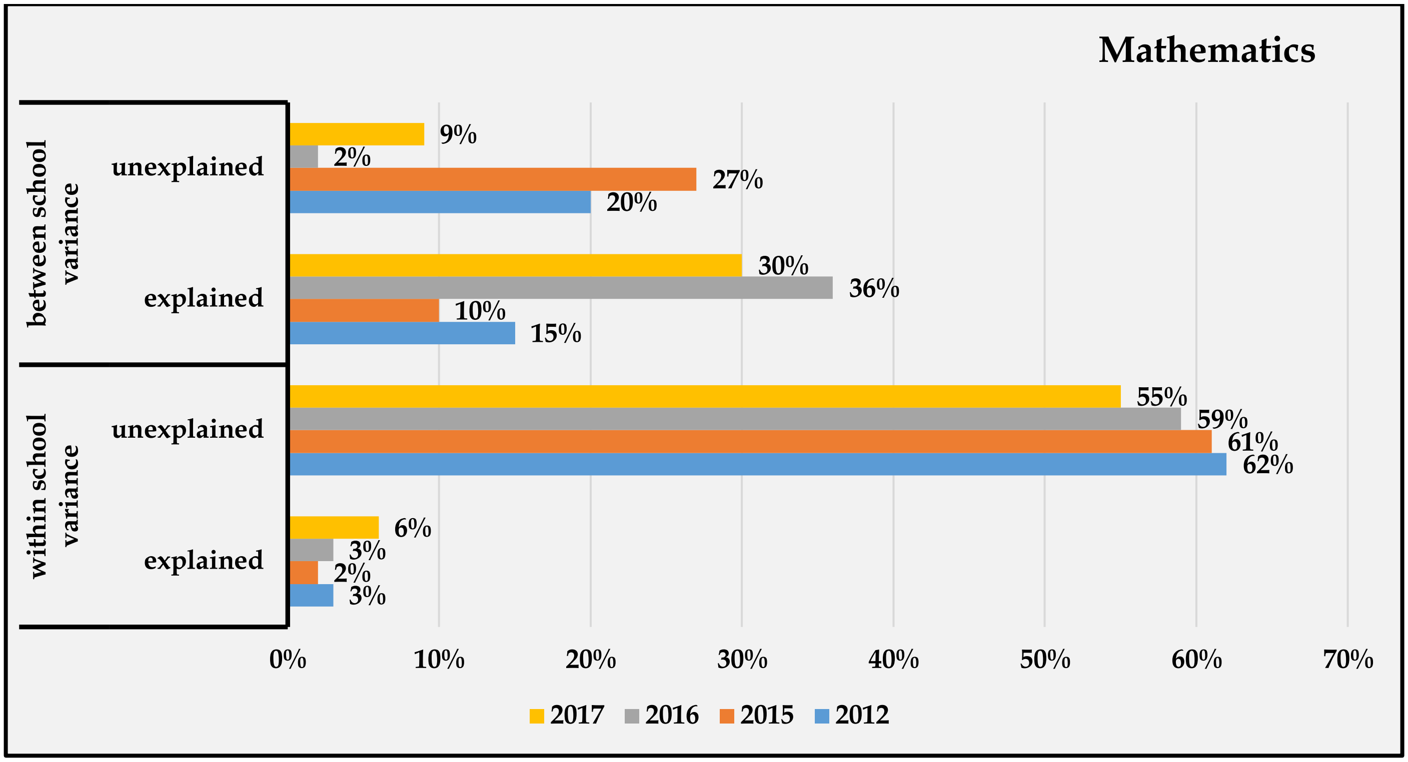

Figure 3.4: Between and within school variance in Mathematics performance, explained and unexplained by SES in 2012, 2015, 2016 and 2017

Since the SES of a learner is a strong predictor of performance, SES explains a relatively large percentage of the total variance in performance. SES can also be used to explain variance between and within schools. The figures above show how much of the total variance was between schools and within schools and how much of these variance components were explained by the school's average SES and a student's personal SES since 2012.

The between variance is split by explained and not explained by school mean SES. The within schools variance is split by explained and not explained by family SES and the between schools was explained by difference in mean school SES. This means that the average socio-economic background of the families attending a school largely determined the level of performance in the school. This finding suggests a low level of equity. However, when comparing over time in English, the percentage explained by school level SES decreased somewhat from 20 in 2012 to 3 in 2017 and the percentage not explained by SES increased from 21 to 31. This result suggests an increase in equity, because the degree in which schools differ in performance, has become less strongly associated with SES. However, as also observed in English performance when comparing over time, in Mathematics, the percentage explained by school level SES decreased somewhat from 15 in 2012 to 2 in 2016 and the percentage not explained by SES increased from 20 to 36 in 2016. These findings suggest an increase in socio-economic equity in education. However, the explained variance for 2017 increased to 30%.

3.4 Conclusion

Socio-economic equity in education is defined as providing all students, regardless of SES, with similar opportunities to benefit from education. Less equitable educational systems show stronger relationships between performance and SES. The first section in this chapter confirmed that there is a strong relationship between learners' performance and their socio-economic background. These results also align with the Biggs model used as the methodological framework for this study by highlighting the input-process-output model of interactive learning.

Generally, educational systems with lower socio-economic equity consist of schools that differ more from each other in average performance than educational systems with higher socio-economic equity. In other words, in educational systems, higher performing students attend similar schools together, while lower performing students attend other schools. In addition, the variation in average school performance is associated with the average SES of the families attending the schools. The divide can be caused by factors such as urban versus rural areas, locations of schools within expensive living areas versus cheaper areas and differences in school fees.

The disparity between high and low performing schools was for a large part explained by the average socio-economic background of the families attending the schools. However, the proportion of this disparity that was explained by SES appeared to decrease from 2012 to 2017, indicating growing socio-economic equity in education.

CHAPTER 4
PERFORMANCE IN ENGLISH AND MATHEMATICS WITHIN THE ZIMBABWE EDUCATIONAL CONTEXT

This chapter describes relationships found in the full population between learner performance, characteristics of the school and learning environment. The way in which statistics are presented are pretty much similar to the presentation in chapter three. All reported results in this chapter are based on learner-level analysis. That is, learners were the unit of analysis, even for variables that were collected at school-level.

4.1 School Characteristics

Some descriptions of school characteristics were collected in the school head questionnaire. The characteristics that were collected and related to performance for this chapter are:

i. School type (Registered versus Satellite)
ii. School facilities (Electricity and Water)
iii. School budget (The total budget divided by school size)

4.1.1 School type

In Zimbabwe, there are two school types; registered and satellite schools. These school types differ in school facilities, infrastructure and resources. Satellite schools do not have the adequate school facilities, infrastructure and resources as registered schools. Table 4.1 shows the performance in English and Mathematics by school type in 2012, 2015, 2016 and 2017. Across the years, the results indicate a significant improvement in English and Mathematics performance from 2012 to 2017 for both Registered and Satellite schools. Between the groups, the results indicate that Registered schools outperformed Satellite schools in both English and Mathematics in 2012, 2015, 2016 and 2017. The difference in 2017 performance between registered and satellite school was 9.4 (316.27-306.87) score points for English and 5.09 (310.34-305.25) score points for Mathematics. These differences are both significant. This shows that the difference in English performance between Registered and Satellite schools was larger than that of Mathematics.

Table 4.1: Performance in English and Mathematics by school type in 2012, 2015, 2016 and 2017

English	**2012**		**2015**		**2016**		**2017**	**2012-2017**
Registered	300.8(1.09)	⇑	305.6(0.87)	⇑	317.43(0.24)	⇓	316.27(0.23)	⇑
Difference	⇑		⇑		⇑		⇑	
Satellite	291.4(0.85)	⇔	293.3(0.97)	⇑	302.84(0.30)	⇑	306.87(0.40)	⇑
Mathematics	**2012**		**2015**		**2016**		2017	**2012-2017**
Registered	300.6(1.06)	⇑	313.3(0.65)	⇑	316.28(0.21)	⇓	310.34(0.20)	⇑
Difference	⇑		⇑		⇑		⇑	
Satellite	293.4(1.05)	⇑	304.3(0.91)	⇑	307.11(0.28)	⇓	305.25(0.39)	⇑

Where {⇑} indicate a significant increase, {⇔} no change and {⇓} significant decrease. Standard errors are reported between brackets.

As shown in Figure 4.1 there was a significant gap between the performances of learners in registered schools as compared to satellite schools in both English and Mathematics. Learners in registered schools outperformed learners in satellite schools.

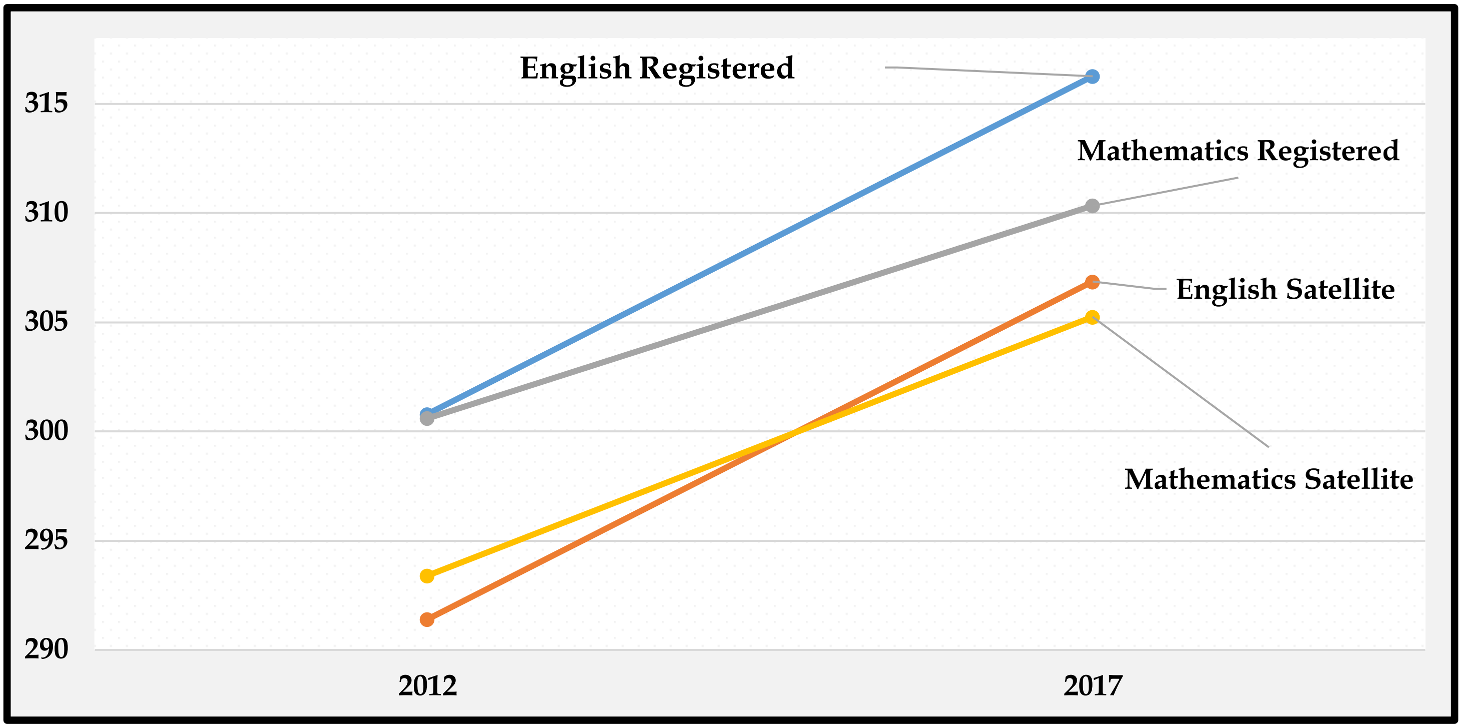

Figure 4.1: Mean performance in English and Mathematics by school type since 2012

Table 4.2 is a cross-tabulation of proficiency levels and school type for 2017. The results indicate that 70.2% of learners from registered schools performed at or above grade level in English whilst 57.0% of learners from satellite schools performed at or above grade level in 2017. For Mathematics, 57.3% of learners from registered schools performed at or above grade level whilst 45.9% of learners from Satellite schools performed at or above grade level in 2017. These results indicate that learners from registered schools performed better than learners from satellite schools. A plausible explanation is that registered schools have better school facilities, infrastructure and resources, therefore, are more likely to afford educational resources for learners and attract better qualified teachers and hence produce better test results.

Table 4.2: Cross-tabulation of Proficiency level and school type for 2017

Proficiency Level	**Registered**	**Satellite**	**Total**
English			
Above grade level	23.6% (3238)	10.1% (278)	21.4% (3516)

At grade level	46.6%(6384)	46.9%(1291)	46.6%(7675)
Below grade level	29.8%(4092)	43.0%(1182)	32.0%(5274)
Total	100%(13714)	100%(2751)	100%(16465)
Mathematics			
Above grade level	18.6%(2556)	10.1%(279)	17.2%(2835)
At grade level	38.7%(5303)	35.7%(983)	38.2%(6286)
Below grade level	42.7%(5855)	54.1%(1489)	44.6%(7344)
Total	100%(13714)	100%(2751)	100%(16465)

4.1.2 School facilities

Electricity and Water

School heads were asked if their schools had the following items; water (piped, tank or spring) and electricity (mains, generator or solar). Descriptive statistics were computed on the total number of items, in the list, they had at the school, on whether they had both electricity and water, either of the two, or none. The results indicate that 33% had neither electricity nor water, 37.5% had either electricity or water (but not both) and 29.5% had both electricity and water. English and Mathematics performance based on these three groups are presented in Table 4.3 below.

Table 4.3: Performance in English and Mathematics in schools with and without electricity and water in 2012, 2015, 2016 and 2017

English	**2012**		**2015**		**2016**		**2017**	**2012-2017**
Electricity and water	308.1(2.64)	⇑	316.2(1.49)	⇑	324.38(0.35)	⇓	314.37(0.38)	⇑
Difference	⇑		⇑		⇑		⇔	

Either electricity or water	295.0(1.18)	⇔	298.0(1.31)	⤊	308.81(0.33)	⤊	314.65(0.34)	⤊
Difference	⤊		⇔		⤊		⇔	
No electricity and no water	291.3(1.33)	⇔	295.4(1.18)	⤊	304.18(0.28)	⤊	315.05(0.37)	⤊
Mathematics	**2012**		**2015**		**2016**		**2017**	**2012-2017**
Electricity and water	306.6(2.27)	⤊	320.8(1.03)	⤋	317.83(0.27)	⤋	309.57(0.32)	⇔
Difference	⤊		⤊		⤊		⇔	
Either electricity or water	296.2(1.45)	⤊	308.0(1.16)	⤊	313.08(0.32)	⤋	309.31(0.29)	⤊
Difference	⇔		⇔		⤊		⇔	
No electricity and no water	292.6(1.68)	⤊	306.0(0.95)	⤊	309.47(0.31)	⇔	309.63(0.31)	⤊

Where {⤊} indicate a significant increase, {⇔} no change and {⤋} significant decrease. Standard errors are reported between brackets.

In Table 4.3, results show a significant increase in performance in both English and Mathematics since 2012 with the exception of learners from schools with both electricity and water in Mathematics. The 2017 results show no significant difference in both English and Mathematics performance among learners in schools with access to both electricity and water, schools with either electricity or water and schools with none of the two. Furthermore, learners attending schools with either water and electricity and those attending schools with none, showed significant improvement in English performance between 2016 and 2017. For Mathematics, there was a significant decrease in performance between 2016 and 2017 for learners attending schools with both water and electricity and those from schools with either electricity or water. Learners from schools with neither electricity nor water did not show any significant change in Mathematics performance between 2016 and 2017.

Figure 4.2 below is a column graph showing that learners performed better in 2017 than 2012 in both English and Mathematics. In 2012, learners from schools with both water and electricity performed better than learners from schools with either electricity or water who in-turn performed better than learners from schools without electricity and water in both English and Mathematics. However, the graph shows no clear differences in height for both English and Mathematics performance in 2017. This means that the performance differences among the groups in 2017 were quite small.

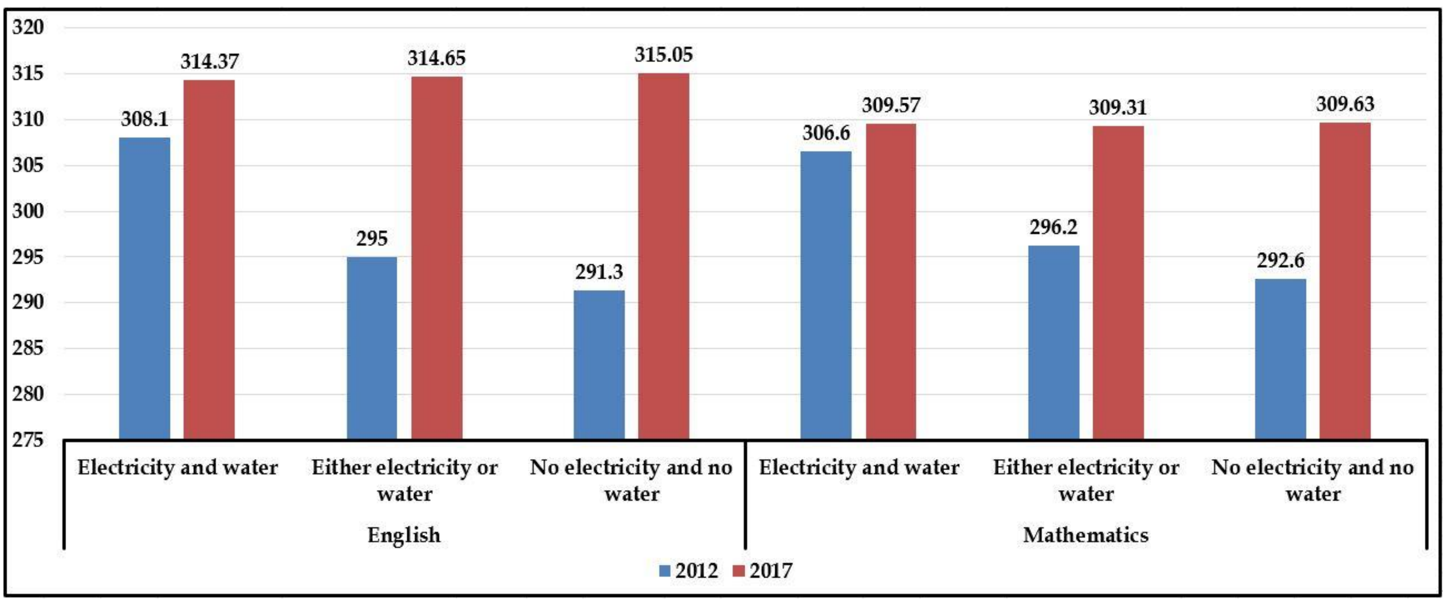

Figure 4.2: Mean performance in English and Mathematics by availability of water and electricity since 2012

Consistent with the results above, 66.7% of learners from schools with water and electricity performed at or above grade level in English and 68.9% and 68.0% from schools with either electricity or water and schools with neither of the two performed at or above grade level respectively, as shown Table 4.4 below. For Mathematics, 55.5% of learners from schools with water and electricity performed at or above grade level and 55.0% and 55.8% from schools with either electricity or water and schools with neither of the two performed at or above grade level respectively.

Table 4.4: Cross-tabulation of Proficiency level and availability of water and electricity for 2017

Proficiency Level	**No electricity and no water**	**Either electricity or water**	**Electricity and water**	**Total**
English				
Above grade level	22.0%(1195)	21.7%(1307)	20.9%(1014)	21.4%(3516)
At grade level	46.1%(2504)	47.8%(2948)	45.8%(2223)	46.6%(7675)
Below grade level	32.0%(1738)	31.1%(1918)	33.3%(1618)	32.0%(5274)
Total	100%(5437)	100%(6173)	100%(4855)	100%(16465)
Mathematics Above grade level	17.6%(956)	16.9%(1042)	17.3%(837)	17.2%(2835)
At grade level	38.2%(2078)	38.1%(2351)	38.2%(1857)	38.1%(6286)
Below grade level	44.2%(2403)	45.0%(2780)	44.5%(2161)	44.5%(7344)
Total	100%(5437)	100%(6173)	100%(4855)	100%(16465)

Permanent Classrooms

Table 4.5 shows the relationship between learner performance and proportion of permanent classrooms in schools in 2012, 2015, 2016 and 2017. Although the results indicate a significant increase in performance between 2012 and 2017, there was no significant difference in performance within the groups. For example, in 2017, learners' performance from schools with all permanent classrooms did not differ significantly from learners' performance from schools with at least two thirds but not all permanent classrooms in both English and Mathematics.

Table 4.5: Relationship between learner performance and proportion of permanent classrooms in schools in 2012, 2015, 2016 and 2017

English	**2012**		**2015**		**2016**		**2017**	**2012-2017**
All permanent classrooms	302.2(2.62)	⇔	306.8(1.98)	⇑	318.53(0.44)	⇓	314.68(0.30)	⇑
Difference	⇔		⇔		⇔		⇔	
At least two-thirds but not all	298.6(2.31)	⇑	306.1(1.10)	⇑	317.10(0.33)	⇓	314.47(0.39)	⇑
Difference	⇔		⇑		⇑		⇔	
Less than two thirds	295.5(1.30)	⇔	299.6(1.59)	⇑	306.72(0.28)	⇑	315.03(0.43)	⇑
Mathematics	**2012**		**2015**		**2016**		**2017**	**2012-2017**
All permanent classrooms	302.1(2.18)	⇑	313.6(1.51)	⇔	316.86(0.37)	⇓	309.51(0.26)	⇑
Difference	⇔		⇔		⇔		⇔	
At least two-thirds but not all	298.1(2.24)	⇑	313.8(0.83)	⇔	315.41(0.28)	⇓	309.33(0.33)	⇑
Difference	⇔		⇑		⇑		⇔	
Less than two thirds	296.7(1.6)	⇑	309.4(1.22)	⇔	310.28(0.27)	⇔	309.65(0.36)	⇑

Where {⇑} indicate a significant increase, {⇔} no change and {⇓} significant decrease. Standard errors are reported between brackets.

4.1.3 School Budget

One question in the school head questionnaire asked for the total annual budget for the school for the current financial year. The instruction was included that the total annual budget referred to all of the funds received by the school throughout the financial year, including government funding, grants, school fees and any other funds received to fund the operations of the school. In order to make the budget comparable across schools, the total budget was divided by the school size to create an index for the size of the budget per learner.

By exploring the distribution of this index and consulting with the ZIMSEC research team, three groups were created: schools with more than US$60 per learner (large budget), schools with US$30 to US$60 per learner (medium budget) and schools with less than US$30 per learner (small budget). Table 4.6 shows the relationship between mean performance and budget per learner within urban and rural areas in 2012, 2015, 2016 and 2017.

Table 4.6: Relationship between mean performance and budget per learner within urban and rural areas in 2012, 2015, 2016 and 2017

URBAN AREAS	**2012**		**2015**		**2016**		**2017**	**2012-2017**
English								
Less than $30	308.4(3.7)	⇑	322.0(2.02)	⇔	319.08(0.93)	⇑	345.58(1.10)	⇑
Difference	⇑		⇔		⇓		⇔	
Between $30 and $60	296.5(4.61)	⇑	320.0(3.55)	⇑	327.97(0.68)	⇑	345.53(1.12)	⇑
Difference	⇓		⇔		⇓		⇔	
More than $60	318.2(4.81)	⇔	325.6(2.39)	⇑	336.46(0.56)	⇑	345.03(1.35)	⇑

Mathematics								
Less than $30	306.9(4.46)	⇑	324.7(1.48)	⇓	316.30(0.75)	⇑	329.63(0.82)	⇑
Difference	⇔		⇔		⇓		⇔	
Between $30 and $60	298.3(4.93)	⇑	323.2(2.53)	⇔	320.56(0.58)	⇑	330.03(0.80)	⇑
Difference	⇓		⇔		⇔		⇔	
More than $60	315.7(3.55)	⇑	326.2(1.74)	⇔	323.12(0.44)	⇑	329.31(0.95)	⇔
RURAL AREAS	**2012**		**2015**		**2016**		**2017**	**2012-2017**
English								
Less than $30	293.2(1.27)	⇔	296.7(1.37)	⇑	304.47(0.30)	⇑	310.38(0.32)	⇑
Difference	⇔		⇔		⇔		⇔	
Between $30 and $60	293.6(1.68)	⇔	297.3(0.79)	⇑	306.17(0.26)	⇑	310.25(0.30)	⇑
Difference	⇓		⇓		⇓		⇔	
More than $60	305.2(3.15)	⇔	305.7(3.64)	⇔	312.78(0.69)	⇓	309.78(0.38)	⇔
Mathematics Less than $30	293.7(1.71)	⇔	307.8(1.12)	⇔	309.71(0.34)	⇓	306.70(0.30)	⇑
Difference	⇔		⇔		⇔		⇔	
Between $30 and $60	294.8(1.37)	⇑	307.4(0.76)	⇑	310.67(0.27)	⇓	306.42(0.28)	⇑
Difference	⇓		⇓		⇓		⇔	

More than $60	306.0(2.62)	⤊	313.3(2.57)	⇔	314.65(0.60)	⤋	306.41(0.36)	⇔

Where {⤊} indicate a significant increase, {⇔} no change and {⤋} significant decrease. Standard errors are reported between brackets.

The 2017 results show no significant difference in English and Mathematics performance among all the three budget groups for both rural and urban schools. For English performance, there were significant performance increases for all the budget groups in both urban and rural areas with the exception of learners from urban schools with a budget of more than $60 from 2012 to 2017. For Mathematics performance, there were significant performance increases for all the budget groups in both urban and rural areas with the exception of learners from schools with a budget of more than $60 from 2012 to 2017. Figure 4.3 and Figure 4.4 are graphically displaying the average performance in English and Mathematics for each of the groups in 2012 and 2017.

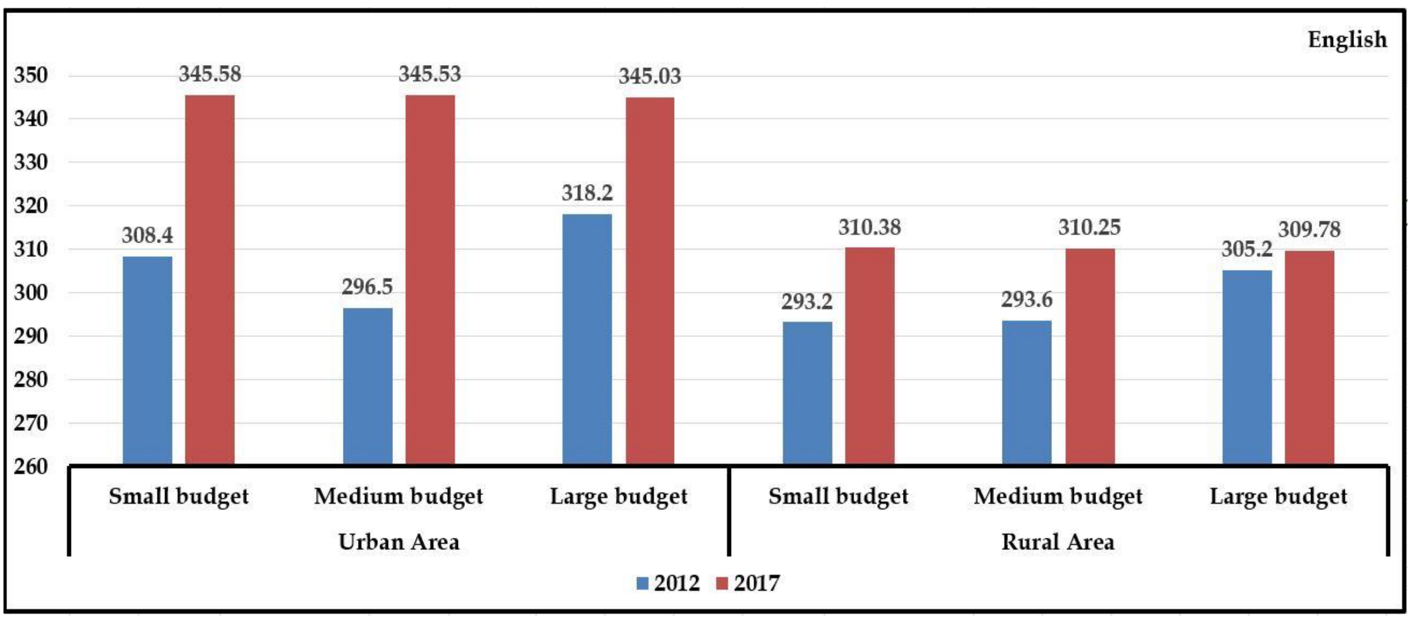

Figure 4.3: Relationship between mean English performance and budget per learner within urban and rural areas in 2012 and 2017

Figure 4.3 above shows that learners from urban schools performed better than learners from rural schools at every budget level in 2017 in both English and Mathematics. The graph does not show any relationship between school budget and mean performance for both English and Mathematics in 2017. Both the question for school budget and school size were open ended questions and the school head had to write down the values. These question types are generally prone to typos and data entry errors.

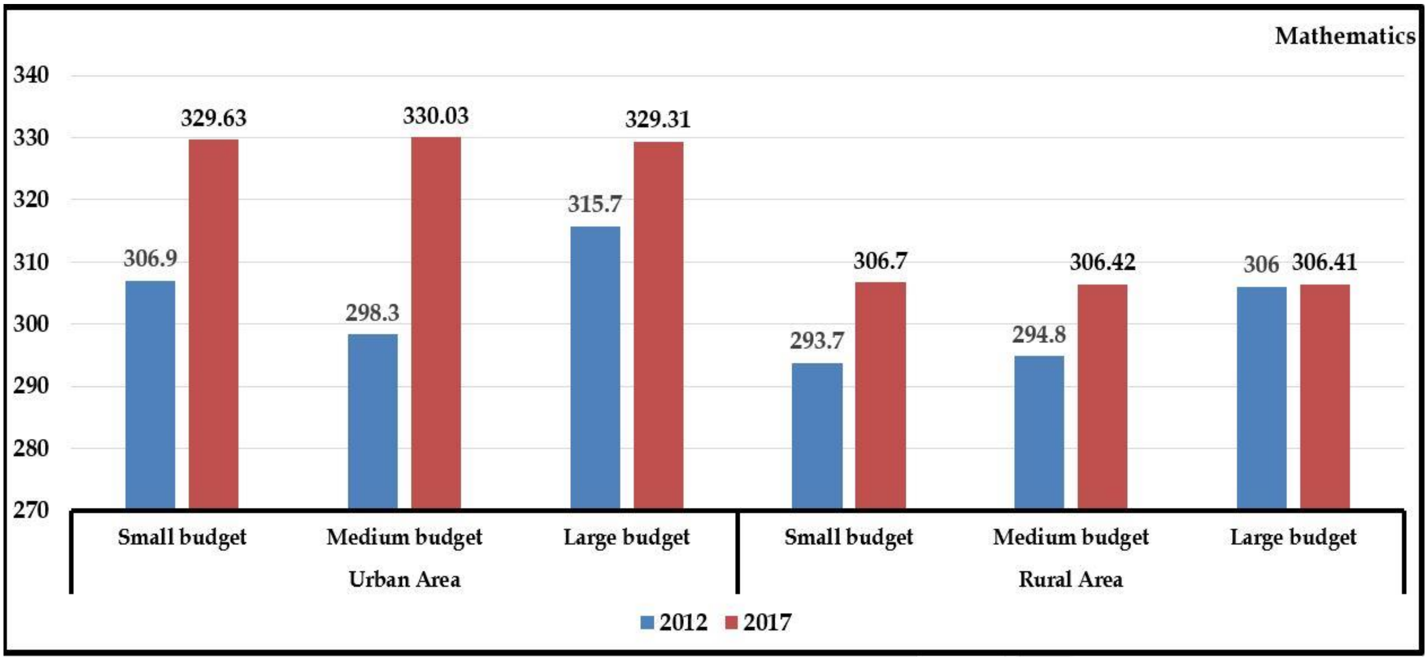

Figure 4.4: Relationship between mean Mathematics performance and budget per learner within urban and rural areas in 2012 and 2017

4.2 Teaching and learning opportunities

4.2.1 Days absent by learners

Learners were asked to respond on the number of days they had been absent in the term of the year in which the assessment took place. The results shown in Table 4.9 show a significant increase in performance in both English and Mathematics between 2012 and 2017. Learners with no days absent outperformed all other learners who had been absent for at least one day in both English and Mathematics as shown by the significant group differences.

Table 4.7: Relationship between learner performance and number of days absent by learner in 2012, 2015, 2016 and 2017

English	**2012**		**2015**		**2016**		**2017**	**2012-2017**
No days	306.6(1.41)	⇔	309.9(1.28)	⇑	317.98(0.28)	⇑	321.39(0.40)	⇑
Difference	⇓		⇓		⇓		⇓	
1-2 days	298.0(0.99)	⇑	302.2(0.69)	⇑	310.19(0.32)	⇑	312.83(0.32)	⇑
Difference	⇓		⇓		⇓		⇓	
3 or more days	294.2(0.94)	⇔	297.4(0.78)	⇑	306.86(0.54)	⇑	309.7(0.34)	⇑
Mathematics	**2012**		**2015**		**2016**		**2017**	**2012-2017**
No days	305.3(1.28)	⇑	316.9(0.93)	⇔	316.28(0.24)	⇓	314.55(0.32)	⇑
Difference	⇓		⇓		⇓		⇓	
1-2 days	298.4(0.95)	⇑	310.9(0.61)	⇔	311.95(0.28)	⇓	308.45(0.28)	⇑
Difference	⇓		⇓		⇔		⇓	
3 or more days	294.8(1.04)	⇑	306.9(0.69)	⇑	310.25(0.47)	⇓	305.23(0.31)	⇑

Where {⇑} indicate a significant increase, {⇔} no change and {⇓} significant decrease. Standard errors are reported between brackets.

Learners who had not been absent from school performed better than learners who had been absent for one or two days. In turn, learners who had been absent for one or two days performed better than learners who had been absent for three days or more in both English and Mathematics in 2017. Table 4.10 is a cross-tabulation of proficiency levels and number of days absent by learner for 2017. In English, 74.8% of learners who had no days absent performed at or above grade level. In Mathematics, 63.4% of learners who had no days absent performed at or above grade level. In general, learners who attend school more often have more opportunities to learn. Absenteeism is a strong predictor of undesirable outcomes in learners and many factors can contribute to learner absenteeism.

Table 4.8: Cross-tabulation of Proficiency level and number of days absent by learner for 2017

Proficiency Level	**No days**	**One - two days**	**Three or more days**	**Total**
English				
Above grade level	30.9%(1666)	18.2%(1123)	11.5%(260)	21.35%(3516)
At grade level	43.9%(2371)	48.0%(2955)	47.8%(2349)	46.61%(7675)
Below grade level	25.2%(1360)	32.6%(2078)	14.8%(727)	32.03%(5274)
Total	100%(5397)	100%(6156)	100%(4912)	100%(16465)
Mathematics				
Above grade level	25.6%(1383)	14.4%(885)	11.5%(567)	18.3%(3221)
At grade level	37.7%(2036)	40.2%(2475)	36.1%(1775)	47.1%(8274)
Below grade level	36.6%(1978)	45.4%(2796)	52.3%(2570)	34.6%(6084)
Total	100%(5397)	100%(6156)	100%(4912)	100%(16465)

4.3 Explaining variance and change in performance

Multivariate analyses were undertaken to examine the combined effects of most important learner and school variables on performance and, in addition, to test if any changes in these variables in 2017 could explain the change in performance. As explained in Chapter 1, section 1.51, statistical relationships in this report cannot be interpreted as causal relationships, however, if we analyse multiple variables at the same time, we take the effect of other important variables into account when testing the relationship between one variable and performance. Therefore, relationships analysed within a multivariate model are more likely to reflect causal effects.

A multiple regression model was chosen to explain variance in English and Mathematics performance. The English and Mathematics performances were used as dependent variables separately. Four variables were included as indicators for socio-economic status (number of home possessions, number of meals per day, parental education, number of home educational resources); two for other learner background variables (gender and number of hours of work for the family per day); location variable (urban versus rural); teaching and learning variables (satellite versus registered schools, school budget per learner per year, number of days absent in the current term, number of books).

Table 4.9: Results of multiple regression analysis explaining variance and trend in English performance

		MODEL 1	MODEL 2	MODEL 3	MODEL 4
	R-SQUARED	**0.22**	**0.25**	**0.27**	**0.30**
	CONSTANT	**380.65(0.99)**	**345.96(1.64)**	**340.94(1.77)**	**349.25(1.85)**
Location	URBAN	**-35.23(0.52)**	**-31.42(0.54)**	**-31.31(0.54)**	**-27.97(0.55)**
Socio-economic	HOMEPOS		**0.86(0.29)**	**1.01(0.29)**	*0.01(0.80)*
	MEALS		**2.67(0.26)**	**2.44(0.26)**	**2.18(0.26)**
	PARED		**5.07(0.28)**	**5.05(0.28)**	**4.285(0.28)**
	HEDRES		**2.13(0.29)**	**1.91(0.29)**	**0.78(0.27)**
Background	GENDER			**5.32(0.35)**	**5.16(0.34)**
	WORK			**-0.97(0.15)**	**-0.79(0.15)**
Teaching and Learning	SATELITE				**-5.28(0.465)**
	BUDGET				*-1.31(0.19)*
	ABSENT				**-2.70(0.22)**
	BOOKS				**4.28(0.28)**

Note: Statistically significant effects are in **bold** and non-significant effects are in *italics.*

Table 4.11 above shows the results of a multiple regression analysis explaining variance and trends in English performance. In the first model, only one component of the location variable (URBAN) was included as the predictor. The URBAN variable predicts English performance significantly. The results indicate that in 2017, learners in urban areas performed on average 35.23 score points higher than learners in rural areas. The R-square was 22%, meaning that the URBAN variable is only explaining 22% of the amount of variation in English performance.

In model 2, the socio-economic background variables (HOMEPOS, MEALS, PARED, HEDRES) were added to the model. The results indicate that all socio-economic variables significantly predict English performance. Every additional home possession item is associated with 0.86 score points increase in English performance, every additional meal with 2.67 score points, every additional parental school level (no school, primary school, secondary school and tertiary education) with 5.07 score points and every additional home education resources with 2.13 score points. When adding the socio-economic variables to the model, the difference in performance between urban and rural areas decreased from 35.23 to 31.42 score points. Together, the location variable and the socio-economic variables explain 25% of the amount of variation in English performance.

In model 3, two background variables are included that are not components of socio-economic status: gender (GENDER) and the number of hours working for the family per day (WORK). The results indicate that these two variables did not change significantly the effects of the variables that were added in the previous models, meaning that they do not explain any of the previously described relationships. Together, the location variables, the socio-economic variables and the two background variables (GENDER and WORK) explain 27% of the amount of variation in English performance. The results also indicate that girls perform better in English than boys by 5.32 score points. Every additional hour that learners worked for their families was associated with a decrease of 0.97 score points in English. These findings are consistent with those shown in Table 2.15. In 2017, Table 2.15 shows that there was a significant difference of 3.33 score points in English performance between learners working more than one hour a day for their family and learners who worked less. This difference decreased from 3.33 to 0.97 score points after taking into account the differences in family socio-economic status and school location.

In model 4, variables related to teaching and learning (SATELLITE, BUDGET, ABSENT and BOOKS) were included. Adding these variables to the model decreased the difference in performance between urban and rural areas from 31.31 to 27.97 score points in English performance. In other words, when taking into account the number of satellite schools, the number of days a learner was absent and the number of reading materials (BOOKS), the difference in English performance between urban and rural areas decreased significantly. Of all the teaching and learning variables, the budget per learner (BUDGET) did not predict English performance significantly. Taking the effects of teaching and learning variables into account slightly reduced the effects of socio-economic status in the model. Together, the location variables, the socio-economic variables, the background variables and the teaching and learning variables explain 30% of the amount of variation in English performance. Furthermore, learners in satellite schools performed 5.28 score points lower than learners in registered schools.

Table 4.10: Results of multiple regression analysis explaining variance and trend in Mathematics performance

		MODEL 1	**MODEL 2**	**MODEL 3**	**MODEL 4**
	R-SQUARED	**0.13**	**0.16**	**0.17**	**0.19**
	CONSTANT	**352.90(0.89)**	**324.08(1.48)**	**322.07(1.60)**	**327.78(1.62)**
Location	URBAN	**-23.19(0.47)**	**-20.11(0.48)**	**-20.12(0.49)**	**-17.57(0.49)**
Socio-economic	HOMEPOS		**0.74(0.27)**	**0.74(0.27)**	*0.06(0.74)*
	MEALS		**2.93(0.23)**	**2.86(0.24)**	**2.71(0.23)**
	PARED		**3.88(0.25)**	**3.87(0.25)**	**3.30(0.25)**
	HEDRES		**1.45(0.26)**	**1.27(0.26)**	*0.01(0.16)*
Background	GENDER			**2.95(0.31)**	**2.82(0.31)**
	WORK			**-0.77(0.14)**	**-0.65(0.14)**
Teaching and Learning	SATELITE				**-2.36(0.42)**
	BUDGET				*-0.05(0.51)*
	ABSENT				**-2.50(0.20)**
	BOOKS				**2.57(0.17)**

Note: Statistically significant effects are in **bold** and non-significant effects are in *italics*

Table 4.12 above shows the results of a multiple regression analysis explaining variance and trends in Mathematics performance. In the first model, only one component of the location variable (URBAN) was included as the predictor. The urban variable predicts Mathematics performance significantly. The results indicate that in 2017, learners in urban areas performed on average 23.19 score points higher than learners in rural areas in Mathematics. The R-square was 13%, meaning that the URBAN variable is only explaining 13% of the amount of the variation in Mathematics performance.

In model 2, the socio-economic background variables (HOMEPOS, MEALS, PARED, HEDRES) were added to the model. The results indicate that all socio-economic variables except the number home possessions (HOMEPOS) significantly predicted Mathematics performance. Every additional meal was associated with 2.93 score points increase in Mathematics performance, every additional parental school level (no school, primary school, secondary school and tertiary education) with 3.88 score points and every additional home education resources with 1.45 score points. When adding the socio-economic variables to the model, the difference in performance between urban and rural areas decreased from 23.19 to 20.11 score points in Mathematics performance. Together, the location variables and the socio-economic variables explain 16% of the amount of variation in Mathematics performance.

In model 3, two background variables are included that are not components of socio-economic status: gender (GENDER) and the number of hours working for the family per day (WORK). Similar to the English results above, the Mathematics results indicate that the background variables did not change significantly the effects of the variables that were added in the previous models, meaning that they do not explain much of the previously described relationships. Together, the location variables, the socio-economic variables and the two background variables (GENDER and WORK) explain 17% of the amount of variation in Mathematics performance. The results also indicate that girls perform better in Mathematics than boys by 2.95 score points. Every additional hour that learners worked for their families was associated with a decrease of 0.77 score points in Mathematics.

In model 4, variables related to teaching and learning (SATELLITE, BUDGET, ABSENT and BOOKS) were included. Adding these variables to the model decreased the difference in performance between urban and rural areas from 20.12 to 17.57 score points. In other words, when taking the number of satellite schools, the number of reading materials and the number of days a learner was absent into account, the difference in Mathematics performance between urban and rural areas decreased significantly. Of all the teaching and learning variables, the budget per learner did not predict Mathematics performance significantly. Together, the location variables, the socio-economic variables, the background variables and the teaching and learning variables explain 19% of the amount of variation in Mathematics performance. Learners in satellite schools performed 2.36 score points lower than learners in registered schools.

CHAPTER 5
CONCLUSION, POLICY IMPLICATIONS AND FUTURE PROGRAMMING

5.1 Summary

The 2017 Zimbabwe Early Learning Assessment was the second cycle to be conducted by MOPSE and ZIMSEC after the expiry of ACER contract and provides an in-depth analysis of three major research questions. These include analysis of how Grade 3 Zimbabwean learners performed in 2017 on literacy and numeracy tests. Another question explored the relationships of a range of variables that may impact learners' performance on literacy and numeracy. The last question was on the extent to which improvement in literacy and numeracy performance could be attributed to EDF resources which were given to schools. Presented in the next section are the key findings of the 2017 research questions.

5.2 Key findings

Early learning assessments provide keystone indicators for assessing system performance. This study presents the following key findings.

1. Overall, the percentage of learners performing at or above grade level was 68% and 55.4% for English and Mathematics respectively in 2017. The 2017 results indicate an increase from 2016 in the number of learners who performed below grade level in both English and Mathematics. In 2016, 71% of the learners performed at or above grade level in English and 65% in Mathematics.

2. Performance in English increased significantly between 2016 and 2017. English performance increased significantly from 313.56 score points in 2016 to 314.70 score points in 2017 and this represents a 0.36% increase. For Mathematics, the average mean performance decreased significantly from 313.85 in 2016 to 309.49 in 2017 and this represents a decrease of 1.39%.

3. Analysis by gender revealed that in 2017, girls out-performed their male counterparts in both English and Mathematics. In 2017, boys and girls had a mean of 312.33 and 317.82 respectively in English while in Mathematics they had 308.16 and 311.27 respectively. The differences in performance between boys and girls in both English and Mathematics were statistically significant. In 2017, 63.9% of the boys performed at or above grade level, whilst 72.7% of the girls performed at or above grade level in English. For Mathematics, 51.6% and 59.4% of the boys and girls respectively performed at or above grade level.

4. The 2017 results indicate that urban schools outperformed rural schools by 35.23 score points in English and 23.19 score points in Mathematics. These performance differences were statistically significant for both English and Mathematics. In 2016, the performance differences between urban and rural schools were smaller than those in 2017 with 24.59 score points in English and 10.38 score points in Mathematics. The 2017 results also show that 93.7% of urban learners performed at or above grade level in English as compared to 64.2% of rural learners. In Mathematics, 87.3% of the urban learners performed at or above grade level. Only 50.7% of the rural learners performed at or above grade level in Mathematics.

5. Analysis by province revealed that Bulawayo and Harare learners outperformed learners from all other provinces in both English and Mathematics in 2017. Learners from Matabeleland South and Mashonaland Central performed the least in both English and Mathematics in 2017. The results further show that there was a significant increase in English performance for all provinces except Manicaland and Matabeleland South between 2016 and 2017. For Mathematics, the results show that only Harare and Bulawayo recorded significant increase in performance between 2016 and 2017. Mashonaland West and Matabeleland North showed no significant performance change in Mathematics whilst the rest of the provinces' performances decreased significantly.

6. In terms of age, the 2017 results indicate that learners aged 6 and below, aged 7 and aged 8 performed the best in both English and Mathematics. Between 2016 and 2017, learners aged 7, 10, 11 and 12 years recorded significant increase in English performance. Only learners aged 9 recorded a significant decrease in English performance. However, there was no significant change in English performance between 2016 and 2017 for the rest of the other age groups. For Mathematics, only learners aged 7 years increased significantly in their performance. There was no significant change in Mathematics performance for learners aged 6 and below and those aged 13. All the other age groups recorded significant decrease in Mathematics performance between 2016 and 2017.

7. Language spoken at home had four groups; Shona, Ndebele, English and Others. The other languages included Venda, Tonga, Shangani, Kalanga, Sotho, Ndau, Sign, Chewa, Chibarwe, Khoisan, Tswana, Xhosa and Nambya. Descriptive statistics show that most of the learners speak Shona (73%) at home, followed by Ndebele (16%), other languages (8%) and English (3%). 2017 Results show that learners who speak English at home outperformed those who speak Shona, Ndebele and Other languages in both English and Mathematics. There were no significant differences in both English and Mathematics performance between learners who speak Shona and Ndebele at home in 2017. The 2017 results further showed that 84.8% of learners who speak English at home, 68.8% who speak Shona at home, 68.0% who speak Ndebele at home and 54.2% who speak other languages at home performed at or above grade level in English. In Mathematics, the percentage of learners who performed at or above grade level in 2017 were; 77.6%, 56.3%, 55.4% and 38.5% for learners who speak English, Shona, Ndebele and Other languages respectively at home.

8. Analysis was done based on the number of hours learners worked at home. Learners were classified into 4 non-overlapping groups: Less than 1 hour, 1 hour and more but less than 2 hours, 2 hours and more but less than 3 hours and 3 hours or more. There are notable performance variations associated to the number of

hours that learners spend working for their families. The 2017 English results indicate that those who work less than one hour per day outperformed all the other groups. However, there was no significant difference in English performance between learners who work 1 hour and more but less than 2 hours and those who work 2 hours and more but less than 3 hours. For Mathematics, the results showed no significant difference among the four groups.

9. The number of meals the learners take per day had a bearing on their performance in English and Mathematics. The 2017 results indicate that learners who had three or more meals per day outperformed those with two meals who in-turn outperformed those who take one meal per day. The difference in performance between learners with three or more meals and those with two meals and the difference between those with two meals and one meal were statistically significant in both English and Mathematics. This trend was similar to that of 2012 and 2017.

10. The 2017 results show that home possessions have an effect on learners' performance in English and Mathematics. Learners were categorised into three groups based on the number of home possessions (electricity, piped water, borehole, television and radio) they had. In 2017, learners who had four or more home possessions outperformed those with two or three, who in-turn outperformed those with one or less home possessions. The differences in learner performance among all the groups were statistically significant in both English and Mathematics. The 2017 results also show that 79.1% of learners with four or more home possessions performed at or above grade level in English, while 68% and 63.8% of learners with two or three and those with one or less respectively performed at or above grade level. In Mathematics 69%, 55.7% and 49.9% of learners with four or more, two or three and one or less home possessions respectively performed at or above grade level.

11. Learners were categorised into three groups (Four or more, two or three and one or less) based on the number of home educational resources (pencil, school bag,

pen, desk, computer and calculator) they had. The 2017 results indicated a significant increase in English performance for all the three groups between 2016 and 2017. However, there was a significant decrease in Mathematics performance in for the groups between 2016 and 2017. In 2017, learners who had four or more home educational resources outperformed those with two or three and those with one or less in English and Mathematics. However, there was no significant difference between learners with two or three and one or less home educational resources in English and Mathematics. The 2017 results also show that 78.1% of learners with four or more home educational resources performed at or above grade level in English, while 64.6% and 63.8% of learners with two or three and one or less respectively performed at or above grade level. In Mathematics 66%, 52% and 50.2% of learners with four or more, two three and one or less home educational resources respectively performed at or above grade level.

12. Analysis was done based on the highest level of parental education attained. The 2017 English and Mathematics results showed that learners with a parent or guardian who completed a tertiary education outperformed those with a parent who completed secondary school who in-turn outperformed learners with a parent or guardian who completed a primary education. In addition, learners with a parent or guardian who completed a primary education outperformed those with a parent who did not go to school.

13. For 2017, mean performances for Shona, Ndebele and Tonga tests were computed for each of the subgroups of gender, school type, school location and province. The results indicate that girls performed better than boys did in all the three language tests. Learners in registered schools performed better than those in satellite schools in all languages. Furthermore, learners in urban areas outperformed those in rural areas in Shona and Ndebele. However, in Tonga, learners in rural areas performed better that those in urban areas. The differences in performance are larger in Shona as compared to Ndebele and Tonga.

14. Leaners were classified into three socio-economic classes (Low SES, Medium SES and High SES). The 2017 results have shown a significant increase in the mean performance of learners in all classes of socio economic status between 2016 and 2017 in English. However, only learners in the High SES class increased significantly in Mathematics between 2016 and 2017. There has been a significant increase in mean performance in both English and Mathematics between 2012 to 2017. Learners from high socio-economic status (SES) outperformed those from medium and low SES in in both English and Mathematics in 2017. In 2017, the performance differences between different SES groups were statistically significant in both English and Mathematics. A similar trend was observed from 2012 to 2016.

15. Notable differences in performance were observed between registered and satellite schools. Between 2016 and 2017, only satellite schools recorded significant increase in English performance. In Mathematics, both satellite and registered schools experienced significant decreases in mean performance in 2017. The 2017 results indicate that registered schools outperformed satellite schools in both English and Mathematics and the differences were statistically significant. Both registered and satellite schools showed significant improvement in English and Mathematics performance between 2012 and 2017. The 2017 results also show that 70.2% of learners from registered schools performed at or above grade level in English, while 57% of learners from satellite schools performed at or above grade level. In Mathematics 57.3% and 45.8% of learners from registered and satellite schools respectively performed at or above grade level.

16. From 2012 to 2016, facilities such as water and electricity had a bearing on learner performance. However, 2017 results indicated no significant performance difference amongst learners with or without electricity and/or water in both English and Mathematics. The 2017 results further showed that 68.1% of learners without electricity and water, 69.5% with either electricity or water and 66.7% with both electricity and water performed at or above grade level in English. In Mathematics, the percentage of learners who performed at or above grade level in

2017 were; 55.6%, 55.0% and 55.4% for learners without electricity and water, with either electricity or water and with both electricity and water respectively.

17. In 2012, 2015, 2016 and 2017, results show no significant difference in performance between learners from schools with all permanent classrooms and those from schools with at least two-thirds but not all in both English and Mathematics. In addition, no significant differences were observed between the performance of learners from schools with at least two-thirds but not all and those from schools with less than two-thirds permanent classrooms in 2017 in both English and Mathematics. For all groups, significant increases in performance were also observed between 2012 and 2017 in both English and Mathematics.

18. Prior to 2017, school budget was found to predict performance significantly. However, in 2017 result from multiple regression show that school budget did not predict learners' performance significantly.

19. In 2017, learners who were never absent in the term the assessment was administered, outperformed those who were absent for one or two days who in-turn outperformed learners who were absent for three or more days in both English and Mathematics. In English, the performance increases between the groups were statistically significant. However, performance in Mathematics showed significant decreases among all the three groups in 2017. In both English and Mathematics, all groups showed a significant increase in performances between 2012 and 2017. The 2017 results further showed that 74.8% of learners with no days absent, 66.2% with one day absent and 62.6% absent for three days or more performed at or above grade level in English. In Mathematics, the percentage of learners who performed at or above grade level in 2017 were; 63.3%, 54.6% and 47.6% for learners with no days absent, with one day absent and with three or more days absent respectively.

20. The 2017 ZELA results from multiple regression analysis reveal that possible changes in location, socio-economic variables, background variables and teaching

and learning variables explain 30% and 19% of the amount of variation in English and Mathematics performances respectively. This means 70% of the amount of variation in English performance is explained by other factors. For Mathematics, 81% of the amount of variation in performance is explained by other factors. An obvious and plausible factor is the distribution of textbooks and resources under the ETF.

5.3 Policy Implications

The analysis of the performance of grade three learners who participated in ZELA 2017 raises to the fore policy issues which are worth discussing. These policy issues emanated from the cognitive data when it was linked to the school and home environment as collected using the School Head and the learner questionnaires.

1. **Community Sensitisation** – Learners who work less than one hour per for their families outperformed those who worked for one or more hour per day in both English and Mathematics. Therefore, there is great need to sensitise the community concerning the repercussions of learners working more than an hour per day. Parents and guardians should encourage learners to spend more time focusing on their education.

2. **Distribution of resources** - Learners from urban areas significantly outperformed their rural counterparts in both English and Mathematics. Results of the multivariate analysis reveal that location variables such as urban and rural have significant relationship to learner performance. This pattern has been observed since 2012 through to 2017. This difference in performance between rural and urban learners signals the need for differentiated policy on funding and distribution of resources in favour of rural and satellite schools. In order to capacitate rural schools, there is need to introduce incentives for rural teachers. There is need to strengthen resources mobilisation skills of school managers in order to

be able to upgrade school facilities. Also policies should be put in place that facilitates School-Parent Partnership (SPP). Such partnership should to strengthen School Development Committees (SDCs), school boards and trustees.

3. **The effect of number of meals on performance of learners** - There is a pronounced undesirable performance of learners who have one meal per day. There is need to implement sustained feeding schemes across the primary level. This is to enable learners to at least have two meals per day, one for the time they are at schools.

4. **Develop systems that minimise the impact of socio-economic status (SES) on learners' performance** - In this study, the index of Socio-Economic Status (SES) was estimated for each student from highest parental education, number of books at home, number of home possessions (electricity, piped water, borehole, television and radio), number of meals per day and number of educational resources (pencil, school bag, pen, desk, computer and calculator). The policy implication is to create study times or periods per day after school and allow learners to access school textbooks, library and other learning facilities within the school premises so that those without texts books, desks, or electricity at home are not disadvantaged. This will reduce the impact of number books at home, number of home possessions and number of educational resources on learners' performance. The impact of highest parental education on learners' performance can be reduced by creating incentives for teachers to do remedial education for under-performing learners. Incentives for teachers include providing them with affordable houses with access to water and electricity, better salaries and rural allowances.

5.4 Lessons Learnt

In the period 2012 to 2017, ZELA data has given huge insight into the dynamics of learning at grade three and the interaction of school and home variables with cognitive variables. One lesson learnt over that period of time is that learners can be assessed effectively at a tender age to determine if they are making progress, if they are meeting proficiency benchmarks and what factors influence their performances. Findings from ZELA can then be used for planning and decision making in educational activities.

The second lesson learnt is that ZELA provides a basis for comparison. Factors such location, gender, age and socio-economic status that influence learners' performance at grade 3 can be compared to those that influence learners' performances at grade 5 and grade 7. Guided by the evidence from ZELA, MoPSE, ZIMSEC, UNICEF and other stakeholders can ask critical questions about primary education in Zimbabwe. How can equity in primary education in Zimbabwe be enhanced? How can the urban-rural performance differenced be addressed?

Another lesson learnt is the need to engage parents more in the assessment of learners. Due to influence of socio-economic status on learners' performance as evidenced by ZELA (2012 - 2017), parents are a valued source of assessment information, as well as an audience for assessment. Because of the fallibility of direct measures of learners, assessments should include multiple sources of evidence, especially reports from parents and teachers. Assessment results should be shared with parents as part of an ongoing process that involves parents in their child's education.

The forth lesson learnt is that assessment of learners can be done in many ways and the best way is to use Item Response Theory (IRT). Some of the ways of assessing learners' performances such as the Classical Test Theory (CTT) have drawbacks that render results unusable. One of the principal drawbacks of the classical test theory is that the evaluation of a learner's performance is strongly influenced by the sample analysed. The IRT allows us to evaluate the learner's ability, the question difficulty and the capability of the item to distinguish between examinees with different ability. These properties do not depend on the sample considered.

The use of IRT enabled ZIMSEC to map performance and items on cognitive instruments. This method enables education providers and policy makers to know what students know and this information can inform the teaching and learning process.

5.5 Future Programming

Given the insights arising from the data, it is the recommendation of this evaluation that ZELA should continue every year and that its name be adopted as Zimbabwe Early Learning National Assessment (ZELNA). The need to expand the ZELA model to students in grade 5 and form 2 cannot be overemphasised. Expanding the programme will strengthen a shift from the monitoring and evaluation programme to the development of a national assessment framework. A national assessment programme provides data important for policy reform, including how to target resources given evidence generated on student equity. The potential for the ZELA model to be used as a long term monitoring program has been acknowledged by MoPSE and ZIMSEC. With the introduction of the new curriculum in Zimbabwe, the expanded ZELA model will provide evidence for improving teacher preparation and professionalism, informing the curriculum review process and developing local community support programmes.

BIBLIOGRAPHY

ACER. *Zimbabwe Early Learning Assessment 2015 Evaluation Report*. ZELA, 2015.

B. Biggs. The role of meta-learning in study processes. *British Journal of Psychology*, 55: 185–212, 1985.

B. Biggs. From theory to practice: A cognitive systems approach. *Higher Education Research and Development*, 12(1):73–85, 1993.

R. Bukaliya and A. Mubika. Assessing the benefits and challenges of the introduction of early childhood development education to the infant grade in the Zimbabwe education system. *Journal of educational and instructional studies in the world*, 2(4):226–235, 2012.

W. Donald and L. Sondergaard. *The Efficiency of Public Education in Uganda*. World Bank, 2008.

Government of Zimbabwe. *Short term Emergency Recovery Programme (STERP): Getting Zimbabwe moving again.* Harare: Government of Zimbabwe, 2009.

P. Kwenda and M. Ntuli. Private returns to education, migration and development policies:

The case of Zimbabwe. *African Development Review*, 26(4):535–548, 2014.

Ministry of Education and Culture. *Authorisation of new primary and secondary schools*.

Government of Zimbabwe, 1991.

L. Munjanganja and M. Machwira. *Education for All 2015 National Review Report: Zimbabwe*. 2014.

F. Mutema. An examination of the learning conditions in zimbabwe's satellite schools: A case of somabhula resettlement area - midlands province. *International Journal of Humanities and Social Science.*, 4(8):284–290, 2014.

A. Nyanguru and M. Peil. Zimbabwe since independence: A people's assessment. *African Affairs*, 90(361):607–620, 1991.

OECD. *Education at a glance 2013: OECD Indicators*. OECD publishing, 2013a.

OECD. *PISA 2012 Results: Excellence through equity: Giving every student the chance to succeed*. OECD Publishing, 2013b.

D. Saklofske and H. Janzen. School-based assessment research in canada. *Mchill Journal of education*, 25:5–23, 1990.

N. Sharpe. *Go to School, Back to School, Stay in School: Kitgum District campaign photo diary, Forum for Education NGOs in Uganda Secretariat and UNICEF Uganda, Kampala*.

UNICEF, 2007.

UNESCO. *Regional overview: sub-Saharan Africa*. UNESCO, 2007.

UNESCO. *EFA Global Monitoring Report: Education for all 2000-2015: Achievements and Challenges.* UNESCO, 2015a.

UNESCO. *Institute for Statistics (UIS) database*. UNESCO, 2015b.

UNICEF. *Zimbabwe education system in a state of emergency*. UNICEF, 2008.

UNICEF. *Zimbabwe education crisis worsens*. UNICEF Press Centre, 2009.

UNICEF. *GPE Support Project. Project Document. Harare*. UNICEF, 2013.

UNICEF. *The Education Development Fund: Stronger systems, better outcomes. Sixth Progess Report. Harare*. UNICEF, 2014.

UNICEF. *Schools for Africa Annual Report*. UNICEF, 2015.

LIST OF FIGURES

LIST OF TABLES