
Learning at Taonga Market in Community Schools

An Assessment of Interactive Radio Instruction (IRI) for Grade 4 learners in Community schools in 2008



QUESTT M&E

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1.0 INTRODUCTION

1.1 Background

Learning at Taonga Market (LTM) is a series of educational radio programs that deliver the basic education curriculum, using the Interactive Radio Instruction (IRI) approach. *LTM* lessons are written and recorded by Educational Broadcasting Services (EBS), under the auspices of the USAID-funded Quality Education Services Through Technology (QUESTT) Project. Each lesson consists of a 30-minute broadcast, along with activities that the class completes before and after the broadcast. The activities for each lesson and the program are described in a mentor's guide. The programme follows the national curriculum and the MOE's calendar of three terms. There are 150 lessons at each grade level, plus five teacher training broadcasts at the beginning of each term.

In 2008 Learning at Taonga Market was broadcast to Grades 1 through 7¹. Table 1 shows the number of learners using IRI in 2008, according to QUESTT data². However, there exist a progressively large number of learners that have been captured by the Ministry of Education 2007 Annual School Census.

Table 1: Number of IRI learners in 2008, by province and gender

Province	Female	Male	Total
Central	4,374	4,358	8,732
Copperbelt	6,377	5,985	12,362
Eastern	7,096	6,860	13,956
Luapula	1,052	1,102	2,154
Lusaka	7,951	7,619	15,570
N/Western	2,791	2,868	5,659
Northern	5,594	5,661	11,255
Southern	8,686	9,097	17,783
Western	2,480	2,618	5,098
Total	46,401	46,168	92,569

LTM is designed to give learners in community schools and IRI schools the opportunity to complete seven years of education through radio-based learning. It is also used in GRZ schools as a supplementary learning resource. At the end of the primary cycle, *LTM* learners in IRI schools may register for the Primary School Leaving Certificate Examination (PSLE) in community schools. Learners who pass the PSLE have a choice to attend upper basic grades in the government schools, or enroll in the DODE Alternative Upper Basic Education Programme at distance learning centres.

¹ The radio lessons were first broadcast to Grade 1 to 7 in 2007

² The learner population in IRI Community schools seem to drop because there were a lot of data that remained uncollected in provinces

1.2 Purpose of the Evaluation

The overall goal of this evaluation is to document the effectiveness of IRI at Grade 4 in IRI with a view to make adjustments to the programme and/or its implementation. The evaluation questions are as follows:

1. What is the level of demand for IRI in Zambia?
2. What are the characteristics of the children who participate in IRI?
3. How frequently do learners attend daily broadcasts?
4. Are learners achieving English Language, and Mathematics, Science and Social Studies as expected at Grade 4 level?

The current evaluation is the second evaluation of LTM at Grade 4. It asks the same questions as earlier evaluations; whether there is demand for LTM, who the learners are, whether they attend radio lessons and whether they are learning. A sample of learners was tested at the end of the year in Community schools. The performance of learners who were using IRI was compared with the performance of a Control group of non-IRI Community schools. IRI Teachers were interviewed to learn about factors that impact the effectiveness of LTM at Grade 4. This report describes demand for IRI, the overall profile of learners, the results of the testing and the teacher's interviews.

The major findings of the Grade 4 evaluation for 2008 were that:

- Performance among all Grade 4 learners is fair in all the subjects, especially Science and Social Studies. Learners from urban areas performed better than those from rural areas. However, learners from Western province from both IRI and Control schools performed better compared to other provinces.
- Learners from IRI schools performed slightly better in all the subjects than those from Control.
- Age did not have a significant influence as performance varied across the different ages.
- Learners taught by a teacher with 1-2 years experience performed better in both IRI and Control schools than those with more experience.
- Male learners performed better than female learners in IRI Schools unlike in Control schools where performance between male and female learners was almost the same.

2.0 EVALUATION METHODOLOGY

2.1 Background

The MOE is offering IRI programming for Grades 1-7 and performance has been measured a number of times with Grade 1. However, MOE needed to gather the same kind of information for the higher grade levels, and achievement testing been undertaken by MOE and QUESTT to report on learner performance for grade 3 and Grade 4. In 2006, achievement testing was conducted for grade 3 and in 2007 Grade 4 achievement testing was conducted in 4 provinces. In 2008 Grade 4 achievement testing was also conducted in 4 provinces where a total 756 learners from IRI Schools and Control schools were tested.

2.2 Sampling Plan

QUESTT expected to test 960 Grade 4 learners in both IRI Community schools and Control (Non-IRI Community) schools. 680 learners were sampled from Grade 4 IRI Community schools and 280 learners were to be Grade 4 Control schools learners. The tests were to be conducted in Eastern, North-Western, Northern and Luapula province, targeting two districts in each province.

The table below shows proposed testing provinces, districts and learners in IRI Community schools and Control community schools. Numbers for sampling were assumed from the learner population for Grade 3 in 2007. The Grade 4 achievement test evaluated learner performance in English, Mathematics, Science and Social Studies using a post-test model to show the learning differences between the IRI Community schools (IRI schools) and Community schools (Non-IRI schools).

Table 2: Target Learners based on 2006 Grade 3 Enrolments

Learners to be Tested	
Target IRI Learners in Eastern province	260
Target Control learners in Eastern province (50% of IRI learners)	80
<i>Total learners in Eastern province</i>	<i>340</i>
Target Learners in Northern province	160
Target Control learners in Northern (50% of IRI learners)	80
<i>Total learners in Northern province</i>	<i>240</i>
Target IRI Learners in North-Western province	140
Target Control learners in North-Western province (50% of IRI learners)	60
<i>Total learners in North-Western province</i>	<i>200</i>
Target IRI Learners in Western province	120
Target Control learners in Western province (50% of IRI learners)	60
<i>Total learners in Luapula province</i>	<i>180</i>
Total IRI learners targeted for testing in Eastern, Northern, North Western and Western	680
Total Control learners targeted for testing in Eastern, Northern, North Western and Western	280
Total Target learners in IRI and Control schools	960

2.3 Implementation

The 2008 IRI Grade 4 Evaluation took place from October 6th to October 17th, 2008. Testing in IRI community schools took 2 weeks, with some provinces completing the testing earlier than others due to the smaller total number of learners targeted.

2.3 Assessment of Learning Achievement

The Test Development Committee was coordinated by the QUESTT M&E Coordinator with support from other project staff namely the Chief of Party, Teacher Education Coordinator, Data Analyst. Furthermore, other staff came from Examinations Council of Zambia, Curriculum Development Centre, Directorates of Standards and Curriculum and Open and Distance Education of the Ministry of Education. Two Grade 4 teachers were also part of the team. A Testing Consultant from the University of Zambia led the team in reviewing the materials for Grade 4 learners with reference from the Zambia Basic Education Curriculum syllabus and other teaching and learning references. The function of the Committee was to produce the Grade 4 assessments and revise them with the assistance of pilot test data. This section describes, in detail the procedures used to develop the assessments.

2.2.1 Test Planning and Development

Test planning took place at a Test Development Workshop from 1st to 2nd September 2008. The Committee reviewed the Zambian lower primary curriculum and determined the content for testing for English Language, Mathematics, Science and Social Studies for Grade 4. A distinction was made between terminal objectives that should have been mastered by the Grade 4 level and developmental objectives that would be mastered at later grades. The Committee then proceeded to write items for each learning area of the assessment.

2.2.2 Piloting and Reviewing the Tests

The general purpose of piloting and reviewing the tests was to see if the items measured the intended skills and to see if they were at the expected levels of difficulty. More specifically, the objectives of the pilot were to ensure that:

1. The tests could be administered to the desired number of pupils in a day
2. The test items yielded the intended information
3. The test items were at the right level of difficulty
4. The items discriminated among High, Medium and Low level learners well

The following is a description of the pilot and review procedures.

The draft versions of the Grade 4 tests were piloted in September 2008 to collect information about the tests. The tests were piloted among pupils who were in Grade 4 because these learners were assumed to be completing the Grade 4 curriculum. Three different copies of each learning area, with similar topics, terminal objectives and weighting, were prepared to be administered in three districts. Six people formed three teams of test administrators. Three administrators came from DODE, CDC and QUESTT National offices and three came from province, namely, the POC and two DRCCs for Mufumbwe and Mwinilunga. The pilot took place over the course of five days from 15th to 19th September. Piloting took place at three government schools and six well-established IRI and non-IRI

community schools in three districts of North-Western province namely, Mufumbwe, Mwinilunga and Solwezi. Schools were purposively sampled from the urban and rural locations in each district.

The test administrators exceeded the goal of 135 learners (45 learners from each district) by administering the tests to 149 learners. Administrators were able to test an average of 17 learners at the six testing centres instead of the targeted number of 15 per centre.

Data was entered using SPSS. At a meeting held on 25th September 2008, the Test Development Committee reviewed the draft version of the Grade 4 tests by comparing the test scores for each item in one paper to other items with the similar topic, terminal objective and weighting. The committee accepted the review procedures of how to use the pilot statistics and proceeded to make final revisions that might be needed. Members then used the statistics along with their experiences from the pilot administration to review and revise the test items.

Members of the Committee rated each test item as Easy, Medium or Hard in terms of the objective that was being tested. Items were examined carefully for revision when administrators encountered problems administering the item during the pilot or when an item was supposed to test a relatively easy or hard objective but the percentage correct did not correspond with its rating.

The pilot test succeeded in achieving each of the four objectives.

1. It was determined that the Grade 4 test could be administered more than the required numbers of pupils per day.
2. Pilot data and experiences from the administration were used to revise the items so that they would yield the intended information.
3. Items that were too easy or difficult were revised or removed from the test.
4. Each section of the test was determined to have a good balance of easy, medium and difficult items.

Once the Technical Committee had revised the Grade 4 tests in conjunction with the pilot data, the final versions of the tests were reproduced for administration.

2.2.3 Test Administration

A training workshop for test administrators was held from 1st to 3rd October, 2008. Educators from each of the four provinces acted as test administrators, including POCs and Senior Education Officers from DODE. Test administrators reviewed guidelines for sampling learners, administering the tests and interviewing teachers. After reading each section of the test, administrators were given time to practise administering the test to each other. Translations were to be provided, for purposes of clarity only on certain topical questions, in Science and Social Studies in Cinyanja, Icibemba, and Kiikaonde to cater for learners in the four provinces of Eastern, Luapula, North Western and Northern.

The evaluation of learners began on 6th October and ended on 17th October. Each team of test administrators consisted of two members. Each team had a team leader who was in charge of ensuring quality control, compiling results and submitting reports. Reports contained information about where testing was done and any problems with test administration. Each team submitted all test results and teacher questionnaires. Test administration proceeded smoothly with no problems that would invalidate the results of any centre. The main problem that test administrators encountered was the inability to test at certain centres because the numbers of learners were too small to provide a meaningful statistical analysis of the test results.

3.0 FINDINGS AND DISCUSSIONS

3.1 Demand for IRI

Over the past seven years, *LTM* has enabled many out-of-school children access to basic education in all the nine provinces of Zambia. According to MOE statistics, there were 361,709 learners in Community schools enrolled in Grades 1 to 7³. IRI programs were being broadcast in 1,880 IRI schools and community schools. The demand for IRI can be traced first from the pattern of establishing IRI schools as shown below.

Table 3: Number of IRI schools and total enrolment

Province	No. of Schools	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Total
Central	325	13,410	11,358	9,478	8,006	6,197	4,521	3,408	56,378
Copperbelt	196	11,289	8,930	8,874	7,254	6,556	5,111	3,711	51,725
Eastern	296	13,276	9,959	9,111	6,074	4,281	4,248	1,518	48,467
Luapula	140	6,669	5,503	4,558	4,185	3,106	2,048	1,120	27,189
Lusaka	204	11,197	8,891	9,774	8,156	7,659	6,050	5,207	56,934
North	98	3,443	2,893	2,609	2,048	1,283	857	606	13,739
Northern	279	11,006	9,613	8,550	7,429	5,112	3,448	1,905	47,063
Southern	248	10,266	8,613	8,227	7,246	5,880	4,326	3,611	48,169
Western	94	3,207	2,594	2,157	1,674	1,259	821	333	12,045
Total	1,880	83,763	68,354	63,338	52,072	41,333	31,430	21,419	361,709

More schools continue to adopt IRI as a teaching methodology adding to an already large number of schools that broadcast the radio lessons in the previous years. In 2008, there were 1, 880 Community schools and IRI centres that were using the radio broadcasts were opened in all the provinces, as shown in the table above.

Table 4: Enrolment of IRI learners from 2000 to 2008, by sex

Learners	2000 Grade 1	2001 Grades 1 and 2	2002 Grades 1 - 4	2003 Grades 1 - 5	2004 Grades 1 - 5	2005 Grades 1 - 5	2006 Grades 1 - 6	2007 Grades 1 - 7	2008 Grade 1- 7
Male	-	3 994	7 104	11 561	19 412	27 819	40 860	50,535	182,589
Females	-	3 788	6 989	11 202	19 101	28 414	40 464	51,040	179,120
Total	1,254	7 782	14 093	22 763	38 513	56 233	81 324	101,575	361,709⁴
<i>Rate of growth</i>	-	521%	81%	62%	69%	46%	45%	25%	256%

³ Source: Ministry of Education, 2008 Zambia Annual School Census

⁴ Source: Ministry of Education, 2008 Zambia Annual School Census

3.2 Profile of learners in IRI schools

3.2.1 Grade and sex of learners

The table shows that 49.5 percent of the learners in IRI schools and community schools were girls, while 50.5 percent were boys in 2008, while in 2007, there was an equal overall representation between sexes. The pattern of proportions from Grade 1 to 7 seem to be generally the same where girls start to be more boys until the third grade when the numbers start to dwindle in comparison to boys and reaching their worst participation rate in the school system in the last two grades of primary level.

Table 6: Number of learners in IRI Schools, by grade and sex in 2008

Grade	Male	percent	Female	percent	Total
Grade 1	40,575	48.4%	43,188	51.6%	83,763
Grade 2	33,886	49.6%	34,468	50.4%	68,354
Grade 3	31,828	50.3%	31,510	49.7%	63,338
Grade 4	26,351	50.6%	25,721	49.4%	52,072
Grade 5	21,257	51.4%	20,076	48.6%	41,333
Grade 6	16,999	54.1%	14,431	45.9%	31,430
Grade 7	11,693	54.6%	9,726	45.4%	21,419
Totals 2008	182,589	50.5%	179,120	49.5%	361,709⁵
Total 2007	127,472	50.0%	127,479	50.0%	254,951⁶

3.2.2 Orphan Status

Since 2003, the proportion of orphans in IRI schools has been higher compared to orphans in GRZ basic schools. 31 percent of the IRI learners in 2007 were orphans, compared to 13 percent in GRZ basic schools as indicated in the table below. In 2008, according to the Ministry of Education statistics, 28 percent of the total IRI learners represented orphans while in GRZ schools, 18% of the learners that were enrolled in the similar grade range of one to seven. 70% of the IRI orphans were single orphans, while 30 percent were double orphans.

Table 7: Number and Percentage of orphans in IRI schools, 2004 - 2008

Overall	IRI 2004	IRI 2005	IRI 2006	IRI 2007	IRI 2008 ⁷
Total enrolled	254,951	56 233	81 324	101,575	361,709
Total orphans	13 188	18 888	27 481	31,488	102,841
Single orphans	8 605	12 636	18 993	20 450	72,309
Double orphans	4 583	6 252	8 488	11 038	30,532
<i>Percent orphans (IRI)</i>	<i>34%</i>	<i>34%</i>	<i>34%</i>	<i>31%</i>	<i>28%</i>
<i>Percent orphans (GRZ)</i>	<i>20%</i>	<i>20%</i>	<i>20%</i>	<i>13%</i>	<i>18%</i>

⁵ Source: Ministry of Education, 2008 Zambia Annual School Census

⁶ Source: Ministry of Education, 2007 Zambia Annual School Census

⁷ Source: Ministry of Education, 2008 Zambia Annual School Census

3.2 Attendance

The total number of lessons for each term is 150 and therefore maximum attendance is 150 days for all the lessons. Attendance ratings were as follows-High = 120 days and above; Medium = 90 to 119 days; and Low = below or equal to 90 days.

Attendance rates for learners was generally high with 3 provinces having more than 50 percent of learners attaining high attendance ratings while Northern province recorded less than 50 percent of the learners were in the high attendance category. Generally, more than half of the tested attended at least 75 percent of the lessons.

Table 8: Percent attendance for Grade 4 learners, by province

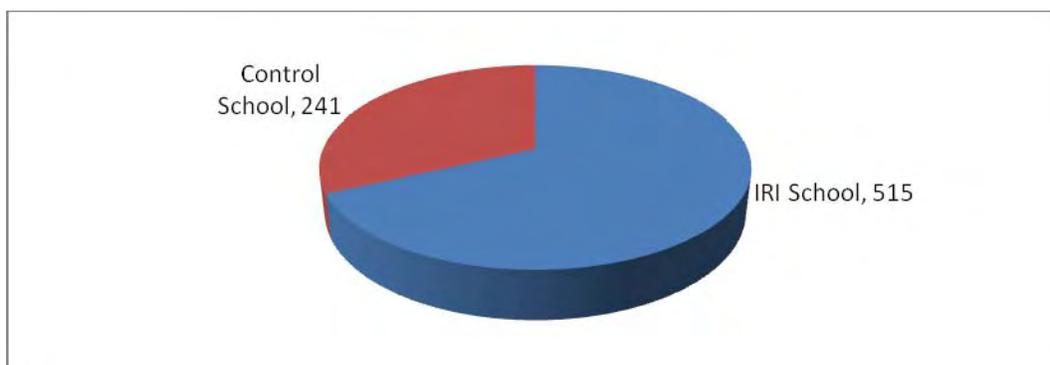
Province	Attendance Rating (Percent)			Total
	High (120 and Above)	Medium 90 to 119	Low (90 or Less)	
Eastern	159(54%)	129(44%)	7(2%)	295
Luapula	121(90%)	7(5%)	6(5%)	134
North Western	94(69%)	38(28%)	4(3%)	136
Northern	61(39%)	78(50%)	17(11%)	156
Total	435(60%)	252(35%)	34(5%)	721

3.3. Number of Learners Tested by School Type

It was planned that 960 Grade 4 learners in both IRI Community schools and control non-IRI community schools would be tested with 680 learners sampled from Grade 4 IRI Community schools and 280 learners from Grade 4 control schools.

During the test administration, a total of 756 learners were tested (21% variation from the target). There were various reasons attributed to low attendance levels and overall class populations from provinces. Thus, 515 learners were from IRI Community schools and 241 from Control schools.

Figure 1: Number of Learners by Type of School



4.0 LEARNER PERFORMANCE

This section highlights the performance of Grade 4 learners in Control and IRI Schools in Mathematics, English, Science and Social Studies. The results will also indicate the overall performance of learners by school type, location, age and teacher experience. The description of the results will also consider the performance of the learners in relation to the learning environment. Total of possible points varied across the 4 subjects. Social Studies and English test had a total of 26 and 38 points respectively, while Science and Mathematics had a total of 24 points each. The total test points were 112.

4.1. Performance by Type of school

Generally, results indicate that the performance of Grade 4 learners in both Control and IRI Schools was ok. Results indicate that performance was slightly better across all the provinces and there were minimal significant differences in terms of performance between Control schools and IRI Schools with overall mean scores of 49.5 and 55.1 respectively as shown in the table below. Performance in Science and Social Studies was better than in English and Mathematics in both Control and IRI schools. Results indicate that learners from IRI Schools performed better than learners from Control schools in all the subjects tested as it can be deduced from the table below.

Table 9: Mean Scores for learners by school type and subtest

School type		English [38 Points]	Mathematics [24 Points]	Science [24 Points]	Social Studies [26 Points]	Total [112 Points]
Control [N=241]	Mean	12.4	10.5	11.9	14.7	49.5
	Percent	32.7%	43.7%	49.7	56.5	44.2
IRI Schools [N=515]	Mean	15.0	11.8	12.6	15.7	55.1
	Percent	39.6%	49.2%	52.4	60.3	49.2
Total [N=756]	Mean	14.2	11.4	12.4	15.4	53.3
	Percent	37.4%	47.5%	51.5	59.1	47.6

4.2 Performance by Province and School Type

The results indicate that learners from IRI Schools in North-Western province performed better in all subjects as compared to other provinces while learners from Control Schools in Luapula province did much better than other provinces. Results further show that learners from IRI Schools in North-Western province performed better than those from Control schools in all the subjects by achieving 48% in English, 49% in Mathematics, 54.3% in Science and 67.1% in Social Studies compared to 21.1, 21.1%, 37.3% and 44.9% respectively. According to the 2007 evaluation of *LTM*, Grade 4 IRI learners in Western Province performed exceptionally well in 2007.

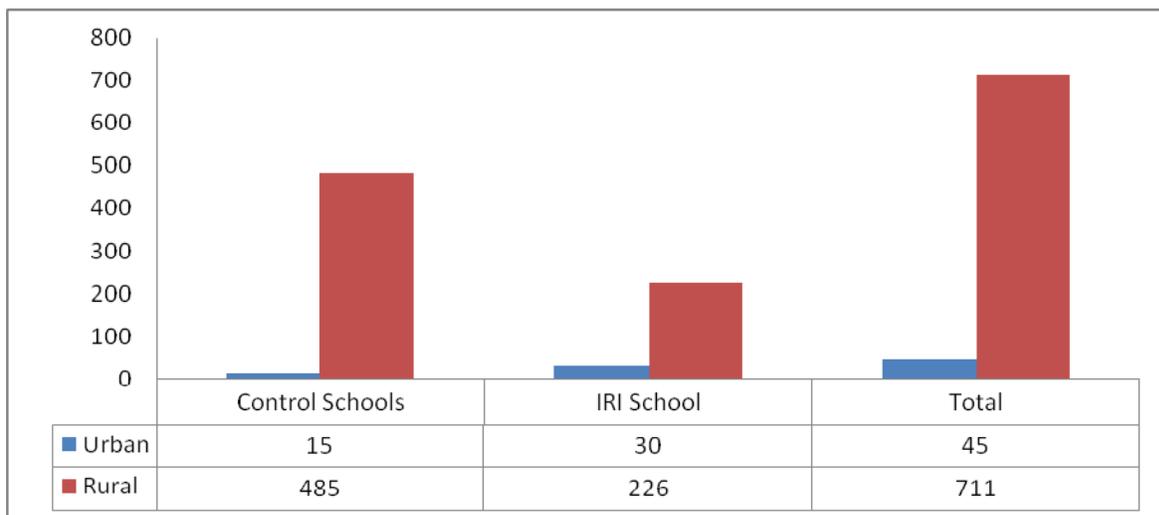
Table 10: Percent mean scores for all learners, by province, school type, and subtest

Province	School type		English [38 Points]	Mathematics [24 Points]	Science [24 Points]	Social Studies [26 Points]	Overall Total [112 Points]
Eastern [N=295]	Control [N=80]	Mean	13.5	11.5	12.7	14.0	51.7
		Percent	35.6	48.0	52.8	53.9	46.2
	IRI [N=215]	Mean	14.7	12.0	13.0	15.6	55.3
		Percent	38.7	50.0	54.1	59.8	49.3
Luapula [N=154]	Control [N= 50]	Mean	13.6	11.1	13.5	17.8	56.0
		Percent	35.8	46.3	56.2	68.3	50.0
	IRI [N=104]	Mean	14.4	11.3	12.5	15.4	53.7
		Percent	38.0	47.0	52.2	59.2	47.9
North Western [N=136]	Control [N=44]	Mean	8.0	5.1	9.0	11.7	33.7
		Percent	21.1	21.1	37.3	44.9	30.1
	IRI [N=92]	Mean	18.3	11.8	13.0	17.4	60.6
		Percent	48.1	49.2	54.3	67.1	54.1
Northern [N=176]	Control [N=67]	Mean	13.1	12.4	11.8	15.1	52.5
		Percent	34.6	51.5	49.3	58.3	46.8
	IRI [N=104]	Mean	13.5	11.9	11.3	14.6	51.3
		Percent	35.4	49.7	47.2	56.1	45.8

4.3 Performance by Location and School Type.

The figure shows that 711 learners, representing 94 percent of the tested learners, were from Rural schools while 45 (6 percent) were from Urban areas.

Figure 2: Learner Distribution by Location and School Type



Results, shown in the table below, indicate that learners from urban areas performed better than learners from rural areas in both IRI and Control school with an overall percent score of 58.3 percent compared to 46.9 percent respectively. Results further show that learners from urban areas performed better in all the four subjects by achieving 51.8 percent against 36.5 percent in English, 61.7 percent against 46.6 percent in Mathematics, 59.2 percent against 51 percent in Science and 64 percent against 58.7 percent in Social Studies.

When disaggregated by type of school, results show that learners from IRI Schools in urban areas performed better than learners from Control schools in all the subjects.

In rural areas, the situation was almost similar to that of the urban Schools where learner performance from IRI was better than that of the Control schools with overall percent scores of 42.4 percent in Control schools and 49 percent in IRI schools.

Table 11: Percent mean scores by Location and School Type

Location	Type of School		English [38 Points]	Mathematics [24 Points]	Science [24 Points]	Social Studies [26 Points]	Overall Total [112 Points]
Urban Area	Control [N=15]	Mean	27.4	17.7	16.2	18.7	80.0
		Percent	72.1	73.6	67.5	72.1	71.4
	IRI Schools [N=30]	Mean	15.8	10.0	13.2	15.6	58.0
		Percent	41.6	41.7	55.0	60.0	51.8
	Total [N=45]	Mean	19.7	14.8	14.2	16.6	65.3
		Percent	51.8	61.7	59.2	64.0	58.3
Rural Area	Control [N=226]	Mean	11.4	10.0	11.6	14.4	47.5
		Percent	30.1	41.7	48.5	55.4	42.4
	IRI Schools [N=485]	Mean	15.0	11.7	12.5	15.7	54.9
		Percent	39.4	48.8	52.2	60.3	49.0
	Total [N=711]	Mean	13.9	11.2	12.2	15.3	52.5
		Percent	36.5	46.6	51.0	58.7	46.9

4.4. Performance by School Type and Sex

The performance of learners by type of school and sex indicates that those from IRI schools performed better than the ones from Control Schools with an overall score of 51.8 and 46.2 for Males and females respectively as compared to 45.7 and 42.7 for Males and Females. When disaggregated by sex, results in the following table below show that in Control schools there was no significant difference between male learners and female learners in terms of performance. On the other hand, male learners in IRI Schools performed better than female learners in all subjects by achieving 42.2% compared to 36.6% in English, 52.7% compared to 45.2% in Mathematics, 54.1% compared to 50.4% in Science and 63% compared to 57.1% in Social Studies.

Table 12: Percent mean scores by school type and Sex

Control or IRI	Sex		English [38 Points]	Mathematics [24 Points]	Science [24 Points]	Social Studies [26 Points]	Overall Total [112 Points]
Control [N=241]	Male [N=123]	Mean	12.9	10.9	12.1	15.3	51.2
		Percent	34.0	45.2	50.5	58.8	45.7
	Female [N=118]	Mean	11.9	10.1	11.7	14.1	47.8
		Percent	31.3	42.2	48.8	54.0	42.7
IRI Schools [N=515]	Male [N=275]	Mean	16.0	12.7	13.0	16.4	58.0
		Percent	42.2	52.7	54.1	63.0	51.8
	Female [N=240]	Mean	13.9	10.8	12.1	14.9	51.7
		Percent	36.6	45.2	50.4	57.1	46.2

4.5. Performance by Age and School Type

Learner age distribution

The performance table below shows results of learners disaggregated by age and type of school. The ages of the learners were categorised as follows; 5-9 years, 10-14 years, 15- 19 years and those aged 20-24 years. Results show that out of the 756 learners tested, 70.5 percent were aged between 10 -14 years, 15.9 percent were aged between 5-9 years, 13.4 percent were aged between 15 -19 years and 0.4 percent were between 20-24 years, while the age for one learner was not recorded. In Control schools, out of the 241 learners tested, 72.6 percent were aged between 10-14 years, while in IRI schools out of the 515 learners tested 69.5 percent were aged between 10 -14 years old. Hence, age distribution was similar in both Control and IRI schools, with most learners aged between 10 -14 years.

Performance

Learners aged below 20-24 years performed better by achieving an overall mean score of 68.7, followed by those aged between 5-9 years who achieved a mean score of 60.3. When disaggregated by type of school, results show that learners from IRI schools, aged between 5-9 years, performed better than those from Control Schools in the same age category by achieving an overall mean score of 60.3 compared to 52.8.

However, IRI learners aged between 10-14 years performed better than their counterparts in Control schools by achieving an overall mean score of 60.3 compared to 43.3. Performance in English was almost the same with those from Control schools in Mathematics with a mean score of 6.9 and 6.8 respectively. Results further show that there was no significant difference between learners aged 11-13 years and those aged 14 years and above from both IRI and Control schools in Mathematics, Science and Social Studies as shown in the table below. Overall mean scores varied with an increase in age in both IRI and Control schools, with an exception of English, where mean scores increased with an increase in age.

Table 13: Percent mean scores, by type of school and age category

Type of School	Age Group		English [38 Points]	Mathematics [24 Points]	Science [24 Points]	Social Studies [26 Points]	Overall Total [112 Points]
Control School [N=241]	5-9 years [N=34]	Mean	13.7	11.4	12.8	14.9	52.8
		Percent	36.1%	47.5%	53.3%	57.3%	47.1%
	10-14 years [N=175]	Mean	12.2	10.5	11.5	14.4	48.5
		Percent	32.1%	43.8%	47.9%	55.4%	43.3%
	15-19 years [N=31]	Mean	12.5	9.8	13.9	16.5	52.5
		Percent	32.9%	40.8%	57.9%	63.5%	46.9%
	Unknown [N=1]	Mean	10	2.0	5.0	7.0	24.0
		Percent	26.3%	8.3%	20.8%	26.9%	21.4%
IRI School [N=515]	5-9 years [N=84]	Mean	16.7	13.0	13.4	17.2	60.3
		Percent	43.9%	54.2%	55.8%	66.2%	53.8%
	10-14 years [N=358]	Mean	14.6	11.4	12.2	15.3	53.5
		Percent	38.4%	47.5%	50.8%	58.8%	47.8%
	15-19 years [N=70]	Mean	14.8%	12.5	13.3	15.5	56.0
		Percent	38.9%	52.1%	55.4%	59.6%	50.0%
	20-24 years [N=3]	Mean	23.3	13.3	14.3	17.7	68.7
		Percent	61.3%	55.4%	59.6%	68.1%	61.3%

4.6. Performance by Orphan status and School Type

Orphan distribution

The performance table below shows results of learners according to orphan status and type of school. The status of the learners were categorised as having learners with *both parents alive, only father alive, only mother alive and no parents alive*. A few learners were recorded as having an unknown status. Results show that out of the 515 learners tested from IRI schools, 62.3% learners had both parents alive. Single orphans accounted for 22.2% where 7.2% had only fathers alive and 15% had only mothers alive. 11.1% learners tested in IRI schools were double orphans, while in Control schools, 64.3% had both parents alive. Single orphans accounted for 23.7% where 5.4% had only fathers alive and 18.3% had only mothers alive. 12% of these were double orphans. 4.5% had unknown status.

Table 14: Learners by Orphan status and School type

Orphan Status	Control School		IRI School	
	Frequency	Percent	Frequency	Percent
Both Parents Alive	155	64.3%	321	62.3%
Only Father Alive	13	5.4%	37	7.2%
Only Mother Alive	44	18.3%	77	15%
No Parents Alive	29	12.0%	57	11.1%
Sub-Total	241	100.00%	492	95.5%
Unknown	0	0.00%	23	4.5%
Total	241	100.00%	515	100.00%

Performance

In IRI schools, the learners who lived with their mothers only performed better than the rest in Mathematics at 54.2% and Science at 53.8%. The double orphans performed better in English at 42.8% and Social Studies at 62.3%. Similarly, in Control schools, the learners who lived with their mothers only performed better than the rest in English at 34.2%. The double orphans performed better in Mathematics at 46.4%.

Overall, the following table also shows that learners with both parents alive in IRI schools did better than those with similar status from Control schools by scoring 45.2% against 40.6%. However, regardless of the learners' status, the learners from IRI schools who lived with their fathers only scored better than those from Control schools with 45.5% against 38.1%. The learners living with mothers only from IRI schools had performed better than those from Control schools again with 46.6% against 40.3%. The double orphaned from IRI School performed better than those Control schools by scoring 46.6% against 39.6%.

Table 15: Percent mean scores by orphan status, sub test and school type

School Type	Orphan Status		English [38 Points]	Maths [24 Points]	Science [24 Points]	Social Studies [26 Points]	Overall Total [112 Points]
Control School	Both Parents Alive [N=155]	Mean	12.5	10.6	12.1	15.0	50.1
		Percent	32.8%	44.2%	50.3%	57.5%	41.1%
	Only Father Alive [N=13]	Mean	10.8	9.2	12.1	14.4	46.5
		Percent	28.3%	38.5%	50.3%	55.3%	38.1%
	Only Mother Alive [N=44]	Mean	13.0	10.0	11.7	14.5	49.2
		Percent	34.2%	41.8%	48.7%	55.9%	40.3%
	No Parents Alive [N=29]	Mean	12.2	11.1	11.4	13.6	48.3
		Percent	32.1%	46.4%	47.7%	52.1%	39.6%
	Total [N=241]	Mean	12.4	10.5	11.9	14.7	49.5
		Percent	32.7%	43.7%	49.7%	56.5%	40.6%
IRI School	Both Parents Alive [N=321]	Mean	14.7	11.5	12.5	15.5	54.2
		Percent	38.7%	48.0%	52.0%	59.6%	44.4%
	Only Father Alive [N=37]	Mean	15.6	11.0	12.7	16.1	55.5
		Percent	41.1%	45.9%	52.8%	62.1%	45.5%
	Only Mother Alive [N=77]	Mean	13.0	13.0	12.9	15.9	56.9
		Percent	34.2%	54.2%	53.8%	61.2%	46.6%
	No Parents Alive [N=57]	Mean	16.2	11.9	12.6	16.2	56.9
		Percent	42.8%	49.5%	52.3%	62.3%	46.6%
	Total [N=492]	Mean	15.1	11.8	12.6	15.7	55.1
		Percent	39.8%	49.0%	52.4%	60.3%	45.2%

4.7 Other Characteristics affecting Performance at Grade 4

This section will look at several characteristics of the teaching environment in relation to the learners' performance. 45 teachers were interviewed using a questionnaire. 3 teachers were from urban areas and 42 teachers were from rural areas. Furthermore, out of the 45 teachers interviewed 31 teachers were from IRI schools, while 14 were from Control schools.

4.7.1. Performance by Teacher Experience and School Type

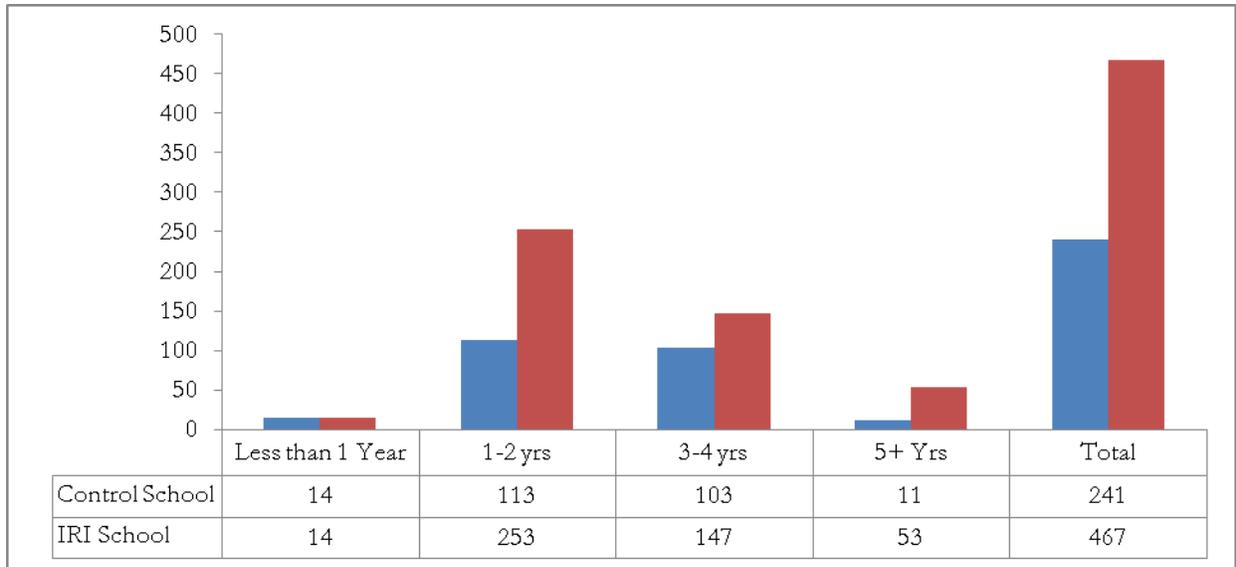
The teacher questionnaire collected information on the teachers' experience in teaching from all the schools where the achievement testing was conducted. Teacher experience was grouped in the following categories: less than 1 year, 1-2 years, 3-4 years and 5 years and above.

Learners by Teacher Experience and School Type

Results show that out of the 515 learners tested from IRI Schools, 253 learners, representing more than a half (54 percent), were taught by a teacher with 1-2 years experience, 147 learners (32 percent) were taught by a teacher with 3-4 years of experience, 53 learners (11 percent) were taught by a teacher with 5 years and above while 14 learners (3 percent) were taught by a teacher with less than one year experience.

Results reveal that most IRI learners (54 percent) were taught by teachers with 1-2 years of experience, while in Control schools 47 percent, of learners, were taught by teachers with 1-2 years of experience, as shown in the figure below.

Figure 3: Number of Learners taught by Teacher Experience and School Type



Learner Performance

Results indicate that in IRI schools, learners taught by a teacher with 5 years and above of experience performed better than those in Control schools taught by a teacher with the same experience. However, learners taught by a teacher with less than 1 year of experience performed better in Control schools than learners in IRI schools taught by a teacher with the same teaching experience. Learners taught by teachers with teaching experience of less than two years performed better in Control schools than did those taught by teachers with more experience. Whereas in IRI schools those taught by teachers with 1-2 years experience performed better than those with more experience. Learners taught by teachers with 1-2 years experience in IRI schools performed better than the ones in Control schools by achieving an overall mean score of 56 compared to 52.6, suggesting that IRI provides guidance for new teachers. Results further show that learners from Control schools taught by a teacher with less than 1 year of experience performed better in 3 subjects than learners from IRI schools. In Mathematics, the percentage scores were 29.8 percent for IRI learners against 50.6 percent for Control schools learners. Control learners also had a better record in English of 35.7 percent achievement compared to 35.5 percent for the IRI schools. Social Studies results were at 61.3 percent for Control learners against 49.5 percent for IRI schools. However, learners from IRI schools performed better in Science by achieving 56.5 percent compared to 49.7 percent achieved by learners from Control schools, as illustrated in the table below.

Table 16: Percent mean score by Teacher Experience and School Type

Type of school	Teacher's Experience		English [38 Points]	Mathematics [24 Points]	Science [24 Points]	Social Studies [26 Points]	Overall Total [112 Points]
Control Schools	Less than 1 year	Mean	13.6	12.1	11.9	15.9	53.6
		Percent	35.7%	50.6%	49.7%	61.3%	47.8%
	1-2 Years	Mean	12.3	11.3	13.0	15.9	52.5
		Percent	32.4%	46.9%	54.1%	61.3%	46.9%
	3-4 Years	Mean	12.5	9.6	10.8	13.2	46.1
		Percent	32.8%	40.1%	45.1%	50.8%	41.2%
5 Years and Above	Mean	11.5	8.5	11.3	14.1	45.5	
	Percent	30.4%	35.6%	47.0%	54.2%	40.6%	
IRI Schools	Less than 1 year	Mean	13.5	7.1	13.6	12.9	47.1
		Percent	35.5%	29.8%	56.5%	49.5%	42.0%
	1-2 Years	Mean	15.2	12.3	12.9	15.6	56.0
		Percent	40.1%	51.2%	53.7%	59.9%	50.0%
	3-4 Years	Mean	14.8	11.6	12.4	15.8	54.5
		Percent	38.8%	48.2%	51.6%	60.9%	48.7%
5 Years and Above	Mean	15.2	9.9	12.5	14.8	52.5	
	Percent	40.1%	41.4%	52.0%	57.0%	46.8%	

4.7.2 Teachers' Education/Qualification

The table below shows teachers' highest level of education achieved by type of school. While teacher education varied from grade 9 to grade 12, according to the table, most of the teachers have gone as far as grade 12 from both IRI schools (23 out of 31) and Control schools (13 out of 14).

Table 17: Teachers' Highest Level of Education by Type of School

Teachers Highest Level of Education	IRI Center	Control School
Grade 9	4	0
Grade 11	2	0
Grade 12	23	13
Other	2	1
Total	31	14

Teachers' educational level seemed to have little influence on learner performance. The overall test scores reveal that learners in IRI schools taught by a teacher who has reached Grade 12 level performed better than learners in Control schools.

Table 18: Percent mean scores by School Type and Teachers Education Level

Type of School	Teacher's education Level		English [38 Points]	Mathematics [24 Points]	Science [24 Points]	Social Studies [26 Points]	Overall Total [112 Points]
Control	Grade 12	Mean	12.3	10.3	11.9	14.8	49.4
		Percent	32.4%	43.0%	49.6%	57.0%	44.1%
	Other	Mean	13.7	12.4	12.2	13.2	51.4
		Percent	35.9%	51.7%	50.8%	50.6%	45.9%
IRI Schools	Grade 9	Mean	13.5	9.1	10.9	14.5	48.1
		Percent	35.5%	38.0%	45.5%	56.0%	42.9%
	Grade 12	Mean	15.6	12.6	13.4	16.1	57.1
		Percent	41.1%	52.4%	55.7%	61.8%	51.0%
	Grade 11	Mean	13.8	9.7	13.1	13.9	50.5
		Percent	36.2%	40.6%	54.5%	53.3%	45.1%
	Other	Mean	14.3	13.0	13.4	16.3	57.0
		Percent	37.5%	54.2%	55.7%	62.8%	50.9%

4.7.3 Teachers Professional Qualification:

Teachers were also asked about their professional qualifications. The responses varied from Primary teachers' certificate, student teacher, trained mentor to untrained teacher.

The table below shows the teachers highest professional qualifications. In IRI schools, out of the 31 teachers interviewed, 24 were professionally untrained, 1 had primary teacher's certificates, and 3 were student teachers. On the other hand in Control schools out of the 14 teachers interviewed, 11 teachers were untrained, 2 had primary teachers certificates, and there were no student teachers. The results show that there were more untrained teachers interviewed than trained in both IRI schools and Control schools.

Table 19: Teachers Professional Education Qualification by Type of School

Teacher's Professional Qualification	IRI School	Control School	Total
Primary Teachers Certificate	1	2	3
Trained Mentors	3	0	3
No Response	3	1	4
Untrained	24	11	35
Total	31	14	45

The results in the following table also show that learners in Control schools taught by an untrained teacher performed better by achieving an overall mean score of 51.2. Furthermore, learners taught by untrained teachers performed better in Mathematics (47.6 percent) Science (51.1 percent) and English (34.1 percent) than the other learners.

On the other hand results show that learners in IRI schools, taught by a teacher with a primary teacher's certificate performed better by achieving an overall percent score of 55.5 percent.

A comparison between the type of school indicate that learners taught by a teacher with a Primary Teachers Certificate in IRI schools performed better in English (42.3 percent), Mathematics (56.1 percent), Science (63.1 percent) and Social Studies (67.4 percent) than learners taught by a teacher of

the same qualification in a Control school who achieved 45.4 percent in Mathematics, 31.2 percent in English, 50 percent in Science and 62.5 percent in Social Studies.

Learners taught by untrained teachers in IRI schools performed better than those in Control schools taught by untrained teachers by achieving 39 percent in English, 52.5 percent in Science and 59.1 percent in Social Studies. The results further show that both IRI and Control schools learners had similar performance in Mathematics by achieving 47.6 percent. These results show that if professional qualification does have an impact on learning, it would appear to be significant here.

Table 20: Percent mean scores by School Type and Teachers Education Level

Type of School	Teacher's qualification		English [38 Points]	Mathematics [24 Points]	Science [24 Points]	Social Studies [26 Points]	Overall Total [112 Points]
Control schools	Primary Teachers Certificate	Mean	11.9	10.9	12.0	16.2	51.0
		Percent	31.2%	45.4%	50.0%	62.5%	45.5%
	No Response	Mean	6.4	2.7	7.3	8.5	24.9
		Percent	16.8%	11.1%	30.3%	32.8%	22.2%
	Trained Mentor	Mean	0.0	0.0	0.0	0.0	0.0
		Percent	0.0%	0.0%	0.0%	0.0%	0.0%
	Untrained	Mean	13.0	11.4	12.3	14.9	51.2
		Percent	34.1%	47.6%	51.1%	57.4%	45.7%
IRI Schools	Primary Teachers Certificate	Mean	16.1	13.5	15.1	17.5	62.2
		Percent	42.3%	56.1%	63.1%	67.4%	55.5%
	Trained Mentor	Mean	15.6	14.4	12.6	16.4	59.0
		Percent	41.1%	60.1%	52.5%	63.0%	52.7%
	No Response	Mean	16.0	11.6	11.3	17.0	55.9
		Percent	42.0%	48.3%	47.3%	65.4%	49.9%
	Untrained	Mean	14.8	11.4	12.6	15.4	54.2
		Percent	39.0%	47.6%	52.5%	59.1%	48.4%

4.7.4 Teachers' number of years of Pre-Service Training:

Teachers were also asked about the number of years of pre-service teaching they have completed. Results show that 17 teachers out of the 31 interviewed in IRI schools had no pre-service training and 6 teachers had 3 years of pre-service training. 3 teachers did not respond as shown in the table below. Of the 14 teachers interviewed in Control schools, none had 3 years of pre-service training and 10 had no pre-service training, while 1 teacher did not respond. Overall results show that the majority of the teachers interviewed in both IRI schools and Control schools had no pre-service training.

Table 21: Number of Years of Pre-Service Training

Number of years of pre-service training that the teacher has completed		
	IRI Schools	Control School
1 Year	3	2
2 Years	2	1
3 Years	6	0
None	17	10
NR	3	1
Total	31	14

The table below shows learner performance by number of years of pre-service training the teacher has completed. Learners taught by a teacher with no experience in IRI Schools performed better than learners taught by a teacher with 1 year of pre-service training by achieving 39.5 percent in English, 51 percent in Mathematics, 54 percent in Science and 61 percent in Social Studies.

On the other hand, in Control schools, learners taught by a teacher with 1 year pre-service training performed better by achieving 39.6 percent in English, 58.7 percent in Science and 70.3 percent in Social Studies.

Unlike the previous year's grade 3 results which showed that teachers with more experience had learners with better performance in both IRI schools and Control community school⁸, Grade 4 achievement results show that learner performance did not seem to be directly linked to the number of years of pre-service training a teacher has completed. Overall test scores indicate that in Control schools learners taught by teachers with 1 year of pre-service training as well as those learners taught by a teacher with no pre-service training performed better than in IRI schools. Learners in IRI schools taught by a teacher with 2 years of pre-service training performed better than learners in Control schools, achieving an overall score of 57.3 per cent. It can be deduced that some learners in IRI schools were taught by teachers with 3 years and above of pre-service training whereas in Control schools there were no teachers with 3 years and above of pre-service training.

Table 22: Mean scores for the overall test for all learners, by subtests by type of school and by Number of years of pre-service training the teacher has completed

Type of school	Number of Years of pre-service training completed.		English [38 Points]	Mathematics [24 Points]	Science [24 Points]	Social Studies [26 Points]	Overall Total [112 Points]	
Control Schools	1 year	Mean	15.1	11.7	14.1	18.3	59.1	
		Percent	39.6%	48.8%	58.7%	70.3%	52.8%	
	2 Years	Mean	13.6	12.1	11.9	15.9	53.6	
		Percent	35.7%	50.6%	49.7%	61.3%	47.8%	
	3 Years and Above	Mean	0.0	0.0	0.0	0.0	0.0	
		Percent	0.0%	0.0%	0.0%	0.0%	0.0%	
	None	Mean	12.00	10.19	11.48	13.71	47.38	
		Percent	31.6%	42.4%	47.8%	52.7%	42.3%	
	NR	Mean	10.3	9.7	12.1	16.5	48.6	
		Percent	27.0%	40.6%	50.3%	63.6%	43.4%	
	IRI Schools	1 year	Mean	13.5	11.1	11.6	13.9	50.0
			Percent	35.6%	46.1%	48.1%	53.3%	44.6%
2 Years		Mean	17.4	15.3	12.7	18.8	64.2	
		Percent	45.7%	63.9%	53.0%	72.1%	57.3%	
3 Years and Above		Mean	16.7	12.0	13.6	16.5	58.8	
		Percent	43.9%	50.0%	56.8%	63.5%	52.5%	
None		Mean	15.01	12.23	12.95	15.86	56.06	
		Percent	39.5%	51.0%	54.0%	61.0%	50.1%	
NR		Mean	11.4	6.0	8.6	11.9	37.9	
		Percent	30.0%	25.0%	35.9%	45.6%	33.8%	

⁸ Source: Grade 3 Report 2006

4.7.6 Number of Teachers Teaching a Class

Furthermore, teachers were asked about the number of additional teachers who have taught their classes in a week or more. Results indicate that 13 teachers out of the 31 interviewed from IRI Schools reported that 1 additional teacher taught their class, 6 teachers said 2 teachers taught their class while 2 teachers said 3 more teachers taught their class for a week or more, while 6 teachers reported that no other teacher taught their classes for a week or more. Results show that in IRI schools most learners were taught by 1 teacher for a week or more, and also in Control schools most learners were taught by 1 teacher.

Table 23: Frequency distribution of the number of teachers who have taught a class for a week or more

Number of additional teachers	IRI School	Control School
0	6	4
1	13	7
2	6	2
3	2	1
4	1	0
5	3	0
Total	31	14

The table below shows learners performance according to the number of teachers that taught the class for a week or more. Learners overall test scores show that learners in IRI schools who were not taught by any other teacher performed better with a total mean score of 63.3, than learners taught by 1-3 additional teachers (54.4), and 3-4 teacher (47.5). Similarly, the overall test scores in Control schools indicate that learners who were not taught by any other teacher performed better by achieving a total score of 63.7 than learners taught by 1-2 teacher (47.4), and 3-4 teachers (53.6).

These results suggest that learners generally understand better what they are taught when they are taught by one teacher for some period of time. Learners and teachers develop a relationship with learners which help the learners to be free and open to them.

Table 24: Mean scores for all learners, by type of school and number of teachers that taught a class

Type of School	Number of mentors/teachers that have taught their class		English [38 Points]	Mathematics [24 Points]	Science [24 Points]	Social Studies [26 Points]	Overall Total [112 Points]
Control School	None	Mean	19.5	14.7	13.9	15.5	63.7
		Percent	51.4%	61.1%	58.0%	59.8%	56.8%
	1-2 Mentors/Teachers	Mean	11.1	9.7	11.7	14.9	47.4
		Percent	29.2%	40.4%	48.8%	57.4%	42.3%
	3-4 Mentors/Teachers	Mean	13.6	12.1	11.9	15.9	53.6
		Percent	35.7%	50.6%	49.7%	61.3%	47.8%
	Non Response	Mean	9.8	6.5	10.0	12.7	39.0
		Percent	25.8%	27.2%	41.7%	48.8%	34.9%
IRI School	None	Mean	18.6	15.2	10.0	15.5	63.3
		Percent	48.9%	63.5%	41.7%	59.7%	56.5%
	1-3 Mentors/Teachers	Mean	14.4	11.6	12.7	15.6	54.4
		Percent	38.0%	48.3%	53.1%	60.1%	48.6%
	4-5 Mentors/Teachers	Mean	11.5	10.1	11.7	14.2	47.5
		Percent	30.2%	42.2%	48.9%	54.5%	42.4%
	Non Response	Mean	14.7	8.4	11.2	13.7	48.0
		Percent	38.8%	35.1%	46.5%	52.5%	42.8%

4.7.7 Training in Taonga Market

Of the 31 teachers interviewed in IRI schools, 19 teachers reported that they had been trained in LTM, while 4 teachers did not respond. In Control schools, 6 teachers reported having been trained in Learning at Taonga Market, while 4 teachers reported not receiving any training from the 14 teachers interviewed.

Teachers were also asked on the duration of training they have received in Learning at Taonga Market. In IRI schools, the number of days of training teachers have completed in Learning at Taonga Market varied from 1 to 7 days, while in Control schools they varied from 1 to 5 days. Out of 31 teachers interviewed in IRI schools, about 61% (19) of the teachers interviewed received 1 to 7 days of complete training in Learning at Taonga Market. In Control schools, out of the 14 teachers interviewed 29% (4) did not receive any training in Learning at Taonga Market, while 21% (3) received 5 days of complete training. Results show that more teachers in IRI schools received training in LTM for 5 days of training, while in Control schools the majority of the teachers interviewed had not received any training in Learning at Taonga Market.

Table 25: Frequency Distribution of the number of days of training in LTM a Teacher has completed

Days of training in LTM	IRI Schools	Control School
0 Days	8	4
1-7 Days	19	6
Total	27	10
NR	4	4
Total	31	14

4.7.8. Learner performance by the number of days of training in *Learning at Taonga Market* a teacher has received

Results show that in IRI schools, learners taught by teachers who never received training in *Learning at Taonga Market* performed better by achieving a total overall score of 61, while in Control schools learners taught by a teacher who received 1 day of training in *Learning at Taonga Market* performed better than those with more days of training by achieving a total overall score of 67. Furthermore, learners from IRI schools taught by a teacher who received training for 4 days performed better than those from Control schools.

However, results show that the number of days of training a teacher has received, particularly in IRI schools, did not have a positive correlation on the performance of learners, as shown below.

Table 26: Mean Scores for the overall test for all learners, by type of school and number of days of training in Learning at Taonga Market

Type of School	Number of days of training in LTM		English [38 Points]	Mathematics [24 Points]	Science [24 Points]	Social Studies [26 Points]	Overall Total [112 Points]
Control School	None	Mean	15.2	12.1	12.2	13.9	53.5
	1 Day	Mean	13.5	15.1	17.7	21.0	67.2
	4 Days	Mean	7.6	7.2	9.8	14.5	39.0
	5 Days	Mean	5.0	10.5	10.6	12.2	45.5
	NR	Mean	12.0	9.2	12.0	15.6	48.8
IRI School	None	Mean	17.7	13.0	14.1	16.3	61.0
	2 Days	Mean	11.0	6.6	10.3	13.1	41.0
	3 days	Mean	14.2	11.3	12.1	15.2	52.9
	4 Days	Mean	11.6	9.0	11.3	14.1	46.0
	5 Days	Mean	13.4	11.1	11.6	14.3	50.4
	7 Days	Mean	15.7	12.4	12.9	17.0	57.9
	NR	Mean	15.0	15.5	14.5	19.6	68.5

4.7.9 Number of years a teachers has been using *LTM*

Teachers were further asked about the number of years they have been using *Learning at Taonga Market*. In IRI schools, out of the 31 teachers interviewed, 17 teachers have been using *LTM* between 1-2 years, while in Control schools 2 teachers reported using *LTM* for the same period of time as shown below.

Table 27: Frequency distribution of the number of years a teacher has been using *LTM*

Number of Years of Using <i>LTM</i>	IRI School	Control School
Less than 1 Year	1	5
1-2 Years	17	2
3-4 Years	6	4
5-6 Years	4	0
7 Years and Above	2	0
NR	1	3
Total	31	14

The table below shows learner performance by the number of years a teacher has been using *LTM*. In IRI schools, learners taught by a teacher who has been using *LTM* for Less than a year performed better, achieving a total score of 62.4. This suggests that those who have used *LTM* for a short period of time may achieve better results as they would want to develop more skill and understanding on how best to use it.

A comparison between teachers who have used *LTM* for 2 years or less, and those that have used *LTM* for 5-6 years, reveal that teachers who have used *LTM* for a shorter period (less than 2 years) achieved better results.

Learners from IRI schools who were taught by teachers with 1-2 years of *LTM* teaching performed better than those from the Control with teachers in the same category.

Table 28: Mean Scores for the overall test for all learners, by type of school and number of Years one has used LTM

Type of School	Number of Years LTM used		English [38 Points]	Mathematics [24 Points]	Science [24 Points]	Social Studies [26 Points]	Overall Total [112 Points]	
Control School	None	Mean	17.45	11.86	13.11	15.41	57.83	
		Percent	45.9%	49.4%	54.6%	59.3%	51.6%	
	Less than a Year	Mean	8.11	9.11	10.33	15.67	43.22	
		Percent	21.3%	38.0%	43.1%	60.3%	38.6%	
	1-2 Years	Mean	11.19	9.38	9.59	11.59	41.75	
		Percent	29.4%	39.1%	40.0%	44.6%	37.3%	
	3-4 Years	Mean	10.32	11.25	12.32	14.75	48.65	
		Percent	27.2%	46.9%	51.4%	56.7%	43.4%	
	NR	Mean	17.39	8.80	11.84	15.26	47.48	
		Percent	45.8%	36.7%	49.3%	58.7%	42.4%	
	IRI School	Less than a Year	Mean	17.70	17.80	12.80	14.10	62.40
			Percent	46.6%	74.2%	53.3%	54.2%	55.7%
1-2 Years		Mean	15.06	12.44	12.85	16.01	56.36	
		Percent	39.6%	51.8%	53.5%	61.6%	50.3%	
3-4 Years		Mean	14.44	10.08	11.83	15.14	51.48	
		Percent	38.0%	42.0%	49.3%	58.2%	46.0%	
5-6 Years		Mean	15.65	9.65	12.60	14.87	53.96	
		Percent	41.2%	40.2%	52.5%	57.2%	48.2%	
7 Years and above		Mean	13.46	9.65	10.96	14.04	48.12	
		Percent	35.4%	40.2%	45.7%	54.0%	43.0%	
NR		Mean	11.58	15.28	14.89	19.06	66.61	
		Percent	30.5%	63.7%	62.0%	73.3%	59.5%	

4.7.10 Total number of classes a teacher is teaching

Teachers were asked about the number of classes they teach and the table below presents the results. Results show that most of the teachers interviewed in IRI schools and Control schools reported teaching between 1-2 classes.

Table 29: Frequency distribution of the total number of classes that a teacher is teaching

Number of Classes Taught	IRI Schools	Control School
1 -2 Classes	25	13
3 Classes and above	6	1
Total	31	14

The table below shows learner performance according to the number of classes a teacher is teaching. The number of classes a teacher is teaching was categorized into 1-2 and 3 and more classes. Results indicate that in Control schools, learners taught by a teacher handling 1-2 classes performed better by achieving a total score of 51.2 than learners taught by teachers handling 3 and more classes. Results also show that teachers handling fewer classes achieve better results because they have more time to prepare and do remedial work for learners in their classes. However, in IRI schools, the results

obtained by learners show that those learners taught by a teacher handling 3 and more classes actually performed better than those handling small classes.

Table 30: Mean Scores for the overall test for all learners, by type of school and number of classes a teacher taught

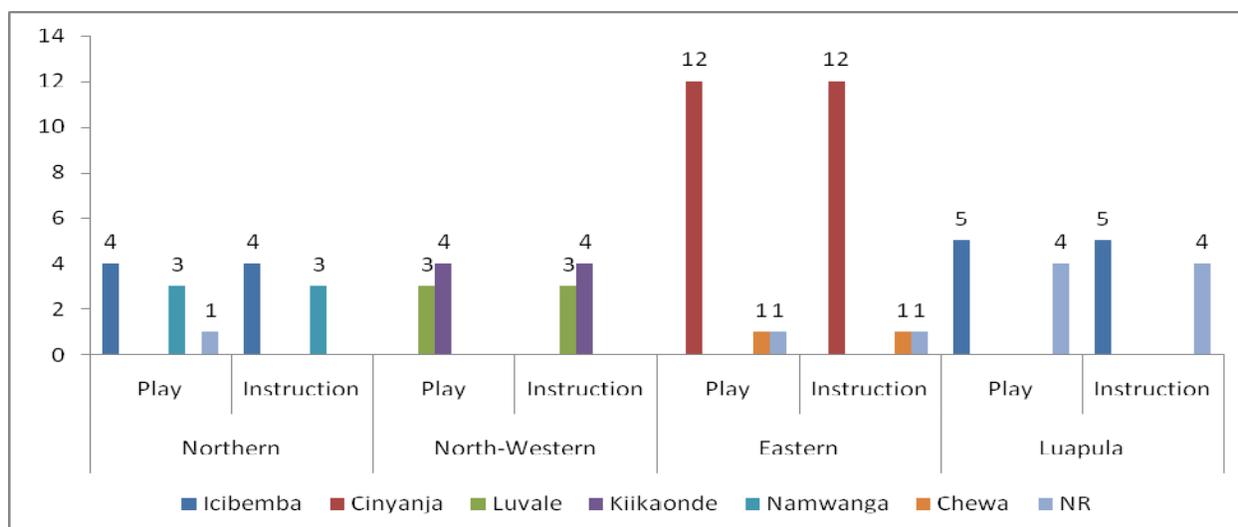
Type Of school	Number of classes taught		English [38 Points]	Mathematics [24 Points]	Science [24 Points]	Social Studies [26 Points]	Overall Total [112 Points]
Control School	1 or 2 Classes	Mean	12.8	11.0	12.2	15.1	51.2
		Percent	33.8%	45.9%	51.0%	58.0%	45.7%
	3 and More Classes	Mean	6.4	2.7	7.3	8.5	24.9
		Percent	16.8%	11.1%	30.3%	32.8%	22.2%
IRI School	1 or 2 Classes	Mean	13.8	11.3	11.9	15.1	52.1
		Percent	36.3%	47.2%	49.4%	58.1%	46.5%
	3 and More Classes	Mean	21.1	14.2	16.1	18.4	69.7
		Percent	55.4%	59.1%	66.9%	70.6%	62.2%

4.8 OTHER FACTORS CONTRIBUTING TO THE LEARNING ENVIRONMENT

Teachers were asked about the language pupils use when playing and the language they use for literacy instruction. In Zambia, languages differ across the provinces and seven languages of education are used. Education authorities choose the language of instruction by selecting the one that is predominantly used as the language of play in the area or the language that is most similar to the language of play from these seven languages. The idea is that children should learn to read and write in a language that they already speak and understand.

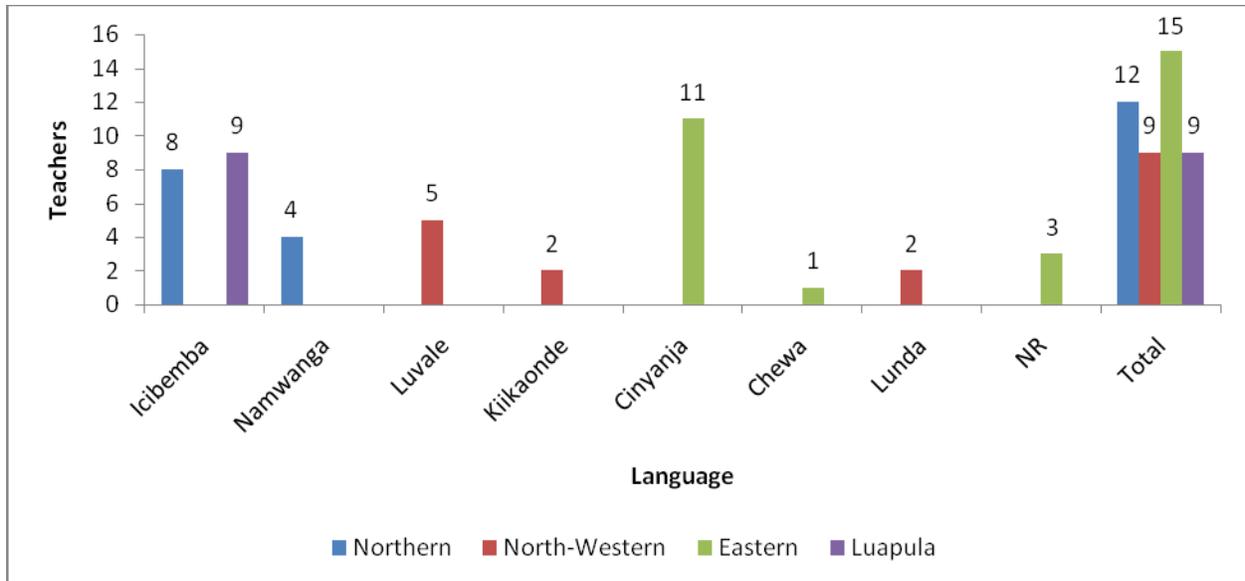
In Northern Province, 12 teachers were interviewed in Mpika and Nakonde districts. The language of play and instruction in all the 3 districts is Ibibemba which was cited by all 13 teachers. In North-Western Province, 9 teachers were interviewed from Kabompo and Kasempa and Luvale (3) and Kiikaonde (4) were cited to be both the languages of play and instructions. In Eastern province 15 teachers were interviewed in Katete and Petauke, and Cinyanja was cited by 12 teachers as the language of play and instruction. In Luapula Province, 9 teachers were interviewed in Kawambwa and Mwense districts, Ibibemba was cited by all the 9 teachers to be the language of play and instruction.

Table 31: Frequency distribution of the language of Play and Instruction



Generally, results show that the language of play is the same as the language of instructions in all the provinces. The figure above shows the frequency distribution of the language of play and instruction.

Table 32: Frequency distribution of the Zambian language used in teaching of Zambian language literacy



Teachers were also asked how well they can speak the language used for literacy and results ranged from *Very well*, *Satisfactory*, *Slightly* and *Not at all*. In Northern Province, 73.7% of the teachers interviewed reported that they can speak the language used for literacy instruction very well while in North-Western province 82.4% of the teacher interviewed said they can speak the language used for literacy instruction very well. In Eastern Province, 81% of the teachers said they can speak very well and in Luapula Province, 90.3% of the teachers said they can speak the language of instruction well. Results indicate that about three quarters of the teachers interviewed say they are able to speak the language used for literacy instruction very well.

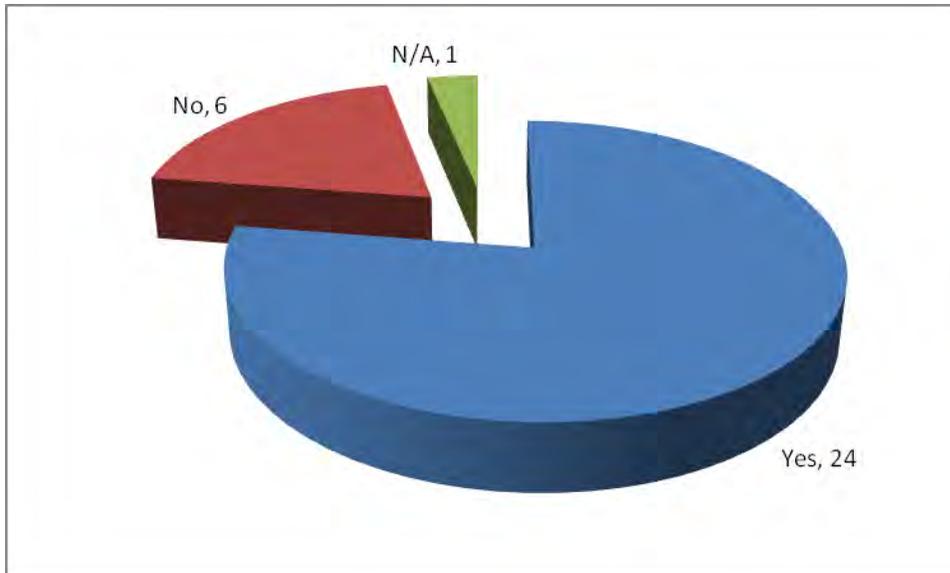
Teachers were further asked how well they could write the Zambian language used for literacy instructions, and responses ranged from *Very well*, *Satisfactory* and *Slightly*. In Northern Province 73.7% of the teachers interviewed said they were able to write very well, in North-Western province 82.4% of the teachers interviewed said they were able to write the Zambian language used for literacy instruction very well. In Eastern Province 74.6% of the teachers said they were able to write very well and 13.6% said satisfactory. In Luapula Province, 90.3% said they able to write very well.

4.8.1 Physical state of the radio and Quality of reception

Physical state of the radio

Only teachers using IRI methodologies were asked about the status of the radio. Results show that out of 31 teachers interviewed, 24 teachers reported that the the radios were working, while 6 said the radios were not working and 1 teacher did not respond at all.

Figure 4: Physical state of the radio



Quality of radio reception

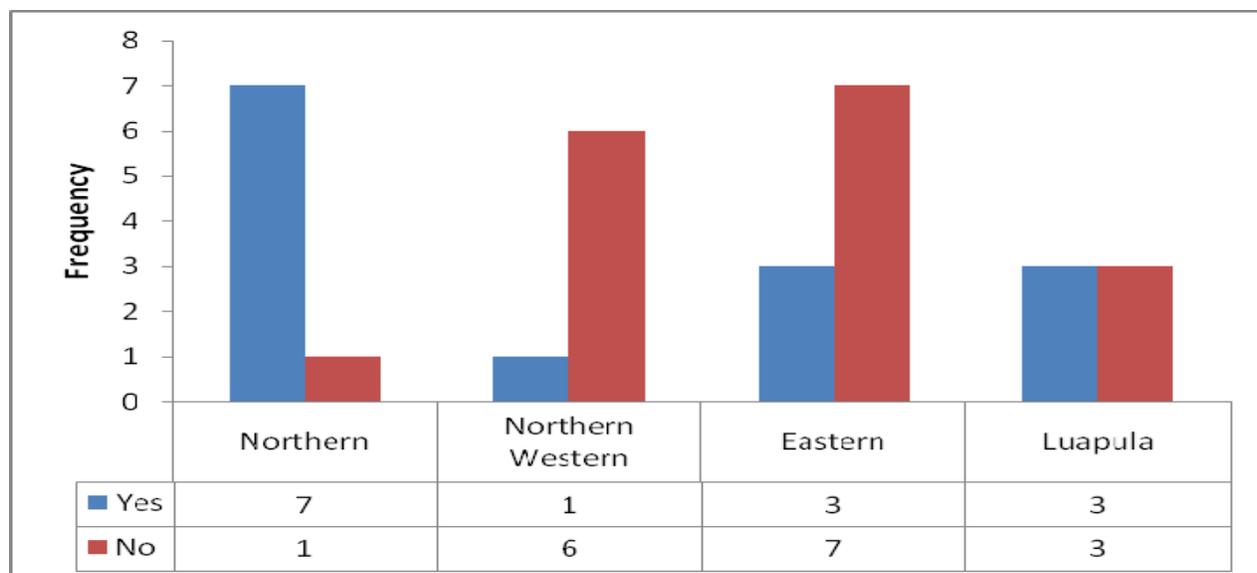
Reception was reported to be acceptable in Northern Province for 4-5 days of the week. In N/Western Province, 3 teachers interviewed indicated that radio reception was acceptable for 2-4 days, while 3 teachers said the reception was hard to hear. In Eastern Province, 6 teachers said the radio reception was very clear for 3-5 days, while 4 teachers said the reception was acceptable for 3-4 days. In Luapula Province, 1 teacher interviewed, indicated that radio reception was clear for all the 5 days. 2 teachers indicated that it was acceptable for 3 days, 2 teachers indicated that it hard to hear.

Table 33: Frequency Distribution of Radio Reception

	Northern	N/Western	Eastern	Luapula
Very clear	0	0	6	1
Acceptable	4	3	4	2
Hard to Hear	5	4	0	1
Impossible to hear	1	0	0	0
NR	1	2	2	2
Total	11	9	12	6

A number of factors can affect the reception of the radio. A radio antenna is usually used to strengthen the signal of radio reception. Teachers were asked if they use antenna extensions to improve radio receptions. Generally, most of the teachers interviewed in most provinces use antennae to improve radio reception, except for North-Western province where 68% of the teachers interviewed said they do not use an antenna to improve the radio reception. Most teachers who said they do not use antennae explained that the radio reception was very clear, while a few (less than 30%) in Northern and North Western Province could not use radio antennae because they did not know how to make them.

Figure 5: Frequency distribution of teachers' use of antennae to improve radio reception



4.8.2 Teaching Materials

The table below shows teaching materials by type of school. Both Control schools and IRI schools had considerable quantities of Chalk, Exercise books and pencils.

Table 34: Frequency Distribution of the Availability of Teaching Materials

Materials	IRI Schools	Control schools
	N=31	N=14
Chalk	12 (41%)	5 (32%)
Pencil	5 (13%)	5 (35%)
Exercise Book	1 (3%)	2 (14%)
Mentor's Guide	16 (49%)	4(30%)
MOE Register	14 (44%)	8 (59%)

Accessibility to learning materials is very important and results show that less than 50% of the teachers interviewed in both Control and IRI schools said learners had access to some of the learning materials. However, Zambian language readers were only accessed by far less than 50% of the learners in IRI while in Control schools, no one access to any readers.

Table 35: Frequency Distribution of the Number of Pupils Accessing Learning Materials

Learning Materials	IRI Schools	Control schools
Zambian Language Activity Book	41(8%)	14(5.8%)
Zambian language reader	20(3.9%)	0
English activity book	45(8.7%)	46(19.1%)
English story book	35(6.8%)	34(14.1%)
Mathematics book	27(5.2%)	0

4.8.3 The Learning Environment

The learning environment can have an influence of the performance of learners. Teachers were asked about what children use to put their books on when writing in class. In IRI schools, almost half of the teachers interviewed reported that learners use the floor for writing, as shown below.

Table 36: Frequency Distribution of what Children use when writing

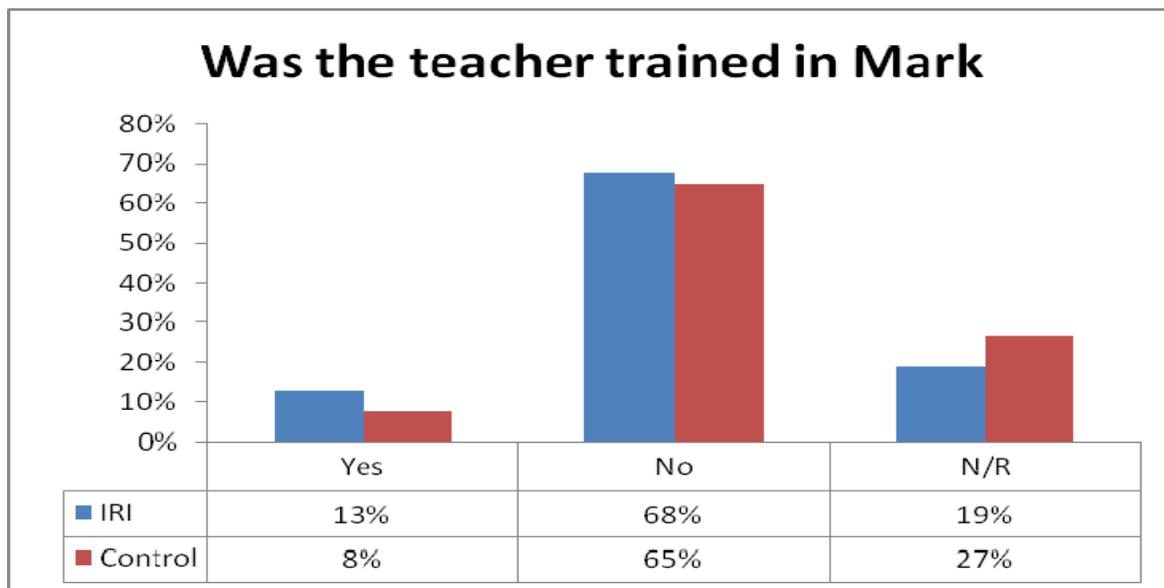
	IRI Schools	Control School
	N=31	N=14
Desk	7 (21%)	3 (20%)
Bench	1 (4%)	4 (26%)
Floor	15 (49%)	3 (23%)
Laps	1 (4%)	0
Other	4 (13%)	2 (17%)
N/A	3 (10%)	2 (15%)

Teachers were asked if their classes were following a truncated syllabus or not. In IRI schools, out of the 31 teachers interviewed, 8 teachers reported using a truncated syllabus, 11 do not, while 12 did not respond. In Control schools, only 2 teachers reported using a truncated syllabus, 8 do not, while 4 did not respond.

4.8.4 Use of the Mathematics Rainbow Kit (MARK)

Teachers were asked if they were trained in the use of the Mathematics Rainbow Kit and results show that less than a quarter of the teachers interviewed in both IRI and Control schools have received training in MARK as shown in the figure below.

Figure 6: Percentage distribution of Teachers trained in MARK



Teachers who have been trained in the use of MARK were further asked on how they received the training and results are presented in the table below. According to the table, out of the 4 teachers who received training in IRI schools, 1 received the training through school mentoring, 2 through a school

workshop and 1 through a district workshop. In Control schools, the one teacher was trained in MARK through a district workshop.

Table 37: Frequency Distribution of how Teacher was trained to use MARK

	IRI Schools N=4	Control School N=1
Through school mentoring	1 (25%)	0 (0%)
Through a school workshop	2 (50%)	0 (0%)
Through a district workshop	1 (25%)	1 (100%)
Total	4 (100%)	1 (100%)

The table below presents information on the teacher's access to and use of MARK Teachers' Guide. Some teachers, despite not receiving training in the use of MARK, had the MARK Teacher Guide. 5 teachers in IRI schools had the Teacher's Guide and 4 of them were trained. In Control schools, 1 teacher had a MARK Teachers' Guide, and the same teacher received training. Almost all teachers with the MARK guides use them to teach Numeracy.

Table 38: Frequency Distribution of Accessibility and Usage of the MARK Teachers Guide

Usage of MARK Guide	Response	IRI Schools	Control schools
Does the Teacher Have a Teachers Guide	Yes	5	1
	No	20	8
	N/R	6	5
Does the Teacher Use the MARK Teachers Guide to teach Numeracy	Yes	3	1
	No	21	9
	N/R	7	4

About 59% of the teachers, who are not using the MARK, said they were not using it because they did not have the guide and they were not trained. A few said they did not see the need for it or they did not know how to use it.

5.0 DISCUSSION OF RESULTS

5.1 Summary

5.1.1 Demand for IRI

Demand for IRI continues to increase in 2008, with 1614 new IRI schools being opened in all the provinces, while the number of learners reduced to 92,569 from 101,575 in 2007.

5.1.2 Characteristics of the IRI Population

The IRI learner population had the following features which were observed.

1. The learner population continues to be almost equally divided between boys and girls.
2. Most of the learners are in the recommended school age
3. A considerable proportion of learners are orphans

The overall 2008 ratio of 51.1 percent girls and 49.9 percent boys indicates that IRI continues to provide equal access to learning for boys and girls at this grade level.

5.1.3 Attendance

Data on attendance was collected from 756 (79%) of the learners out of the 960, that were interviewed. Results show that more 50 percent of the learners tested had high attendance, meaning they attended more than 100 lessons, while 35 percent had medium attendance. This reveals that there is high participation in IRI lesson broadcasts.

5.1.4 Achievement

The performance was generally fair across all the 4 provinces where the test was conducted. There was no much difference in performance between Control and IRI schools though learners from IRI did better than those from Control school. Most learners had difficulties in English and Mathematics, while performance in Social Studies and Science was slightly better. Results also show that learners from IRI schools performed slightly better in all the subjects than learners from Control schools.

Learners taught by a teacher with 5 years and above of experience performed better than those in Control schools taught by a teacher with the same experience. Learners taught by teachers with teaching experience of 1-2 years performed better in both IRI and Control schools than did those taught by teachers with more experience.