Macrothink Institute™

International Research in Education
ISSN 2327-5499
2013, Vol. 1, No. 1

The Effects of the Verbal Language (English) on the Performance of Children with Hearing Impairments in Mathematics in Zimbabwe

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Received: July 23, 2013 Accepted: August 11, 2013 Published: September 17, 2013

doi:10.5296/ire.v1i1.4284 URL: http://dx.doi.org/10.5296/ire.v1i1.4284

Abstract

The purpose of this study was to explore the effects of the verbal language (English) on children with Hearing impairments in their performance in mathematics. The study emerged from observation of practice, personal experiences and discussion with fellow teachers. Children under study were drawn from Bulawayo the second largest city and Gweru the third biggest city of Zimbabwe. Questionnaires were completed by a sample of 20 grade six teachers who took part in the study. The teachers provided biographical information; qualifications, teaching experiences and the set up they are working in. In Zimbabwe the Primary Education System is the same throughout the country from Grade one to seven with children's ages ranging from 5 to 11 or 12years. Mechanical and story sums with the same items were written by 100 children with hearing impairments. Results indicate that children performed better in mechanical than in story sums. The verbal language appears to greatly influence the performance of mathematics in children with hearing impairments, due to poor comprehension, limited vocabulary and lack of understanding mathematical terms.

Keywords: hearing impairments, verbal language, comprehension, mechanical and story sums

1. Introduction

In response to The Education for all Handicapped Act, (94: 142, 121a, 56 (9)) Zimbabwe implemented the program for children with hearing impairments from 1983 after the 1981 disability survey. According to Taylor (2000) a learning disability disorder manifests itself in an imperfect ability to listen, think, speak, read, write, and spell or to do mathematical calculations. In this study children with hearing impairments refer to children who face challenges and difficulties in the acquisition and use of listening, speaking, reading, writing, reasoning and mathematical abilities. Due to inclusion almost all schools in Zimbabwe have children with some form of hearing impairment. These children are provided for by the Ministry of Education through Schools Psychological Services. Over the years it has been noted that these children perform poorly in mathematics in comparison to other children. Children included in this study have mild to profound hearing impairment.

While language acquisition takes long in children with hearing impairments, comprehension takes even longer and makes it more difficult for concepts that require reading and comprehension. Mathematics has four major operations; addition, subtraction, multiplication and division and these develop in children through the use of language. Kelly and Berent (2011) emphasize that learning strategies or techniques are dependent on a child's understanding and comprehension of the language used. The application of principles or rules in the learning of mathematics facilitates the acquisition, manipulation, integration, storage and retrieval of information and concepts learnt.

Like reading, mathematics is a subject that is indeed necessary for functioning adequately in society. It appears that most children with hearing impairments have extreme deficits in their academic performance due to communication difficulties and other related problems (Taylor, 2000). Solving of story sums demands reading and comprehension of the English language, which is difficult for children with hearing impairments (Kelly & Gaustad, 2006). Development of the English language is the key to all learning particularly in Zimbabwe where almost all subjects are written in English except Shona, Ndebele and other foreign languages. Research findings (Hitchcock, Prater, & Dowrick, 2004; Taylor, 2000; Kelly & Gaustad, 2006) indicate that the growth in reading achievement in children with hearing impairments is slower than that of other children. Therefore children with hearing impairments experience more difficulties in interpreting meanings of printed words to indicate mathematical operations. Association of the correct process with a word indicating subtraction, addition, division and multiplication, is a problem. Most of the problems emanate from the deficiencies of language development.

According to the literature review (Gandari, Ndoro, & Kaputa, 2003), very little research has been carried out in developing countries in the area of problem solving or story sums with children who have hearing impairments. However, there is clearly a need for children with hearing impairments to be meaningfully educated in problem solving/story sums. In his study Cook (2001), indicates that most children with hearing impairments have difficulties in problem solving mathematics. He goes on to point out that, skills most frequently characterized by problem solving, conceptual understanding and reasoning are the most essential in real life situations. The importance of story sums/problem solving concepts, ties in their foundational role in the development of application in real life situations. Ansell and Pagliaro (2006) assert that problem solving mathematics is the capstone of elementary mathematics and the cornerstone of high school mathematics. In particular, the realization that problem solving mathematics or story sums are used in almost all professions, to mention but a few; pharmacists, architects, builders, carpenters, doctors, teachers, nurses engineers, accountants, the list is endless. In one way or the other no matter how simple or difficult it may be, there is need for problem solving skills. Kelly and Berent (2010) state that language has an important part to play when children with hearing impairments are faced with the task of solving story sums.

2. Methodology

The experimental design method was used to conduct this study. The main focus of this study was to explore the effect of the English language on the performance of primary school children with hearing impairments in mathematics. Studies carried out by Taylor (2000) and Bernstein & Tiegerman-Farber (2002) all indicate that children with hearing impairments experience difficulties in working out problem solving sums. Two, twenty-item test papers and a ten-item questionnaire were used to gather data from the participants.

3. Participants

The participants comprised of all grade six children with hearing impairments in 10 selected Gweru urban primary schools and 10 selected Bulawayo central primary schools. Each school had an average of 10 pupils with hearing impairments making a population of 200 in all. Through the schools administration records, schools were selected according to how well their programs were developed and supported. The sample comprised of grade six children with hearing impairments who were attending the selected schools in Gweru and in Bulawayo. In order to obtain a sample, the researchers used the formula available in Babbie (1990: 69) and Kent (2001: 7). Simple random sampling was used to create a balanced number of 100 participants 50 from Gweru and 50 from Bulawayo. A random number table was used to prepare cards that were used to randomly select the required sample. Valid numbers were smaller than 100 and invalid numbers were bigger than 100. All children who picked valid numbers and all grade six teachers of children with hearing impairments from the selected schools took part in the study.

Table 1. Number of children who took part in the study (N = 100)

Region	Number of schools	Boys	Girls	Total
Gweru	10	25	25	50
Bulawayo	10	25	25	50
Total	20	50	50	100

All the 100 children with hearing impairments who took part in the study were integrated in the mainstream but were withdrawn for either mathematics or English or for both. However, for the purposes of this research the focus was on mathematics.

4. Research Instrument

The researchers used self-designed test papers on mechanical and story sums to gather data from grade six children with hearing impairments. A questionnaire was used to gather data on personal information, teaching experiences and qualifications from the teachers of the grade six children with hearing impairments, who were involved in the study. Two mathematics test papers with the same items, twenty in number, were designed from a grade six mathematics textbook by the researchers: one with mechanical and the other with story sums. The test items covered all the four operations in mathematics, addition, subtraction, multiplication and division. A questionnaire with 10 items was used to collect personal information from grade six teachers; teaching experiences, qualifications and number of children taught.

4.1 Development of the Instrument

After a thorough survey of all relevant literature, no suitable instrument was found which could be used in this particular study. The researchers developed their own instruments. Some of the key references that were consulted include Bernstein & Tiegerman-Farber (2002), Jager (2002), Taylor (2000). Therefore, the instruments were made specifically for this study with the help of ideas from Kent (2001) and Babbie (1990). Focusing on the statement of the problem, the instrument for this study was designed from an original pool of 30 items, 5 items on fractions, 6 items on addition, 6 items on subtraction, 7 items on multiplication and 6 items on division. These items were given to practicing qualified specialist teachers in the area of hearing impairments. The focus was on:

1) Accuracy in terms of computation
2) Clarity of language
3) Age appropriateness of vocabulary used
4) Level of operation
5) Coverage of the four basic mathematics operations

With the help of qualified specialist teachers of children with hearing impairments at one private school certain items were deleted and the wording of certain questions was altered. Changes that were made by specialist teachers reduced the items to 25. The final process, which was the pilot project, was aimed at the structure of the whole instrument, its relevance to the research questions, repetition of items, accuracy of computation, level of operation, terms used in the wording and clarity. The pilot project was carried out with 50 standard six hearing pupils and 20 standard six children with hearing impairments. This further reduced the items to 20 that made up the final questionnaire, with 3 items on fractions, 4 items on addition, 4 items on subtraction, 5 items on multiplication and 4 items on division.

5. Data Collection Procedures

Two test papers with the same items one with mechanical sums and the other with story sums were administered to 100 children with hearing impairments. The researchers organized with school heads the dates and times they could visit each school. At every school the researchers asked to meet all the standard six children in the school hall or dining hall. They then explained the purpose of the research and clarified what children could not understand. The researchers had their box of valid and invalid numbers and all children who picked valid numbers were then kept in the school hall/dining hall where they wrote the story sums first and then mechanical sums. Papers were collected as soon as children completed the tests. The idea of giving them story sums first and reversing the order of items on one of the papers was deliberately done in order to make sure that children do not correlate test items. Grade six teachers were given a questionnaire on personal information, teaching experiences and qualifications to complete. These were also collected on the same day. The same procedure was followed at all schools until the required data were collected.

6. Discussion and Interpretation of Research Findings

One hundred grade six pupils with hearing impairments and twenty grade six teachers who taught these children completed test papers and questionnaires respectively. There was a 100% respond rate mainly because the test papers and teacher questionnaires were self administered and collected on the same day. The response rate was good although not all pupils answered all questions.

Table 2. Gender & Age of Teachers N=20

Gender	Frequency	Percentage
Male	6	30%
Female	14	70%

Out of the 20 grade six teachers who took part in the study, 30% were males and 70% were females, indicating that in this sample there were more female than male teachers. Of the 20 participants thus 20% had ages from 21 to 30, 15% had ages from 30 to 35 years, 30% had ages from 36 to 40 years and 35% had ages from 41 to 50 years. The purpose of this information was to find out if there was a very big disparity in terms of the experiences and ages of the teachers which would constitute maturity and how this would impact on children's performance. However, this was not perceived as a factor that would influence the results since the teachers' experiences and ages were not significantly different. Table 2, indicates that most of the teachers who were teaching children with hearing impairments particularly those who took part in this study were quite mature in age.

Table 3. Teaching experiences, children with and without hearing impairments N = 20

Teaching hearing children	Frequency	Percentage	Teaching children with hearing impairments	Frequency	Percentage
1 – 5 years	2	10%	1-5 years	6	30%
6-10 years	2	10%	6-10 years	6	30%
11-20 years	10	50%	11-20 years	6	30%
21-30 years	6	30%	21-30 years	2	10%

Results indicate that all teachers who participated in the study had taught in regular schools before. 10% of the teachers had a teaching experience of 1 to 5 years, another 10% had taught for 6 to 10 years, 50% had taught for 11 to 20 years while 30% had teaching experiences of 21 to 30 years. It is evident that most (90%) of the teachers had taught for 6 to 30 years and were quite experienced teachers. Three groups of 6 teachers, 30% per group had taught children with hearing impairments for 1 to 5 years, 6 to 10 years and 11 to 20 years respectively. Only two teachers had taught for 21 – 30 years. Teachers who had taught for 6 to 30 years could be considered quite experienced as indicated by Kelly and Lang (2001) when he pointed out that a teacher who has taught for more that five years in one area has acquired useful knowledge and skills that could be counted on the teacher's experiences.

Table 4. Qualifications of teachers N = 20

Academic & Professional Qualifications	Frequency	Percentage
(O) Level + CE Primary	8	40%
(O) Level (CE/ Dip) in Special Education	4	20%
(O) Level + B Ed Special Education	6	30%
(A) Level + B Ed Special Education	2	10%

The number of teachers in the first category 40% had Ordinary Level plus an ordinary teaching diploma without specialist training, 20% of the teachers had (O) Level and a certificate or diploma in special education, 30% of the teachers had (O) Level plus B Ed. in special education while 10% had Advanced Level and B Ed. in special education. As a whole 60% of the teachers who participated in the study who were teaching grade six classes were qualified special education teachers.

Table 5. Performance of children in both mechanical and story sums N = 100

Students	Mechanical sums scores
10	0%
54	1 - 49
28	50 – 99%
8	100%

Students	Story sums scores
28	0%
57	1 - 49%
15	50 - 76%

In mechanical sums 10% of the children did not score anything at all, while 54% scored below fifty percent and therefore 64% failed the test. Twenty eight percent of the children scored a passing mark of 50% and above with 8% scoring 100%. In story sums, 28% of the children did not score anything at all, 57% scored below fifty percent, while 15% of the children scored 50 % and above thereby passing the test. The highest child scored 76%. When the marks for mechanical and story sums were combined, only 18% of the children scored 50% and above, 82% scored below 50%. A comprehensive analysis of children's marks was carried out. It is important to point out that if a child skipped a sum it was considered that the child did not know it and therefore it was marked wrong. In this case the researchers considered all questions answered. A further analysis of item by item was carried out to find out how children performed on individual items and possible reasons were discussed.

7. Discussion and Interpretation of Results

Results in table 2 indicate that out of 20 grade six teachers, who participated in the study, 30% were males and 70% were females. The same table shows that 80% of the teachers were quite mature age-wise ranging from 31 to 50 years, with only 20% between 21 and 30 years. Kelly & Lang (2001) point out that children with special needs require teachers who are mature in age and experienced in teaching. Most teachers who were teaching children with hearing impairments had an average of 10 pupils per class. With eight to ten children per class, a teacher can effectively implement individualized teaching and effectively monitor the progress on individual programmes. In their research study Bernstein & Tiegerman-Faber (2002) established that the fewer the children attending a mathematics class the more time the teacher allows children to manipulate, examine and experiment with the learning materials available. This helps children to identify the properties, values of concrete numbers and understand concepts better. Most classes in developing countries go up to 45 children per class (Rao, 2010). It appears to be difficult for a teacher of 45 children to give special attention to only one or just two children. Time to draw and implement an Individualized Educational Program is not easy to come by when sports and other duties have to be fulfilled by the same teacher. Children with hearing impairments have a difficulty in comprehending language (Kamhi & Housman, 1999) they tend to confuse less than and more than in mathematical calculations.

On teaching experiences in regular schools, results show that 80% of the teachers had taught for 11 to 30 years and only 20% had taught for 1 to 10 years. However, on teaching children with hearing impairments most of the teachers (70%) had been teaching children with hearing impairments for more than five years and only 30% had taught for five years and below. Bernstein and Tiegerman-Farber (2002) who conducted a number of researches on the teaching of mathematics to children with hearing impairments endorse that there is no substitute for experience and therefore it is important to have experienced teachers teaching mathematical concepts to children with hearing impairments. As cited in the review of literature (Hitchcock, Prater, & Dowrick, 2004; Bernstein & Tiegerman-Farber, 2002), emphasize the importance of having experienced teachers working with children with special needs particularly those with hearing impairments. The three assert that experienced teachers teach at the right pace, they issue suitable instructions to each individual child and they have different ways of motivating different children.

Results on qualifications indicate that 60% of the teachers are qualified in special education ranging from diploma to degree. 40 % of the teachers have a qualification in general teaching. It is important for teachers to be correctly qualified because it gives them confidence. It is assumed that qualified teachers have direction in terms of what they are supposed to do when helping children, and they have the knowledge on the difficulties that children with hearing impairments meet in their learning environments. A study by Taylor (2002) indicates that qualified and experienced teachers are better placed in teaching children with special needs. Another study carried out by Clements (1999) also shows that specialist trained teachers were better at handling children with hearing impairments in social and emotional aspects without frustration than regular schoolteachers. While trained teachers in special education would be the ideal in teaching children with special needs, this goal is not always achieved. According to the researchers' experiences all schools have some teachers who only have regular training and yet some of them produce very good work. Studies carried out by Charema (2010) in Zimbabwe, Dean and Nettles (1987) in Australia, Kamhi & Housman (1999) in the USA indicate that there was no significant difference in terms of the performance of children taught by specialist teachers when compared to those taught by teachers who only had regular training. In areas where children did well the results were similar and in areas where children did badly again the results were similar.

7.1 Test Results for Both Mechanical and Problem Sums

Generally children did not perform well in both mechanical and story sums. However, children performed better in mechanical sums than they did in story sums. Test results for mechanical sums indicate that 36% of the children passed mechanical sums, 15% passed story sums, 64% failed mechanical sums while 85% failed story sums. In a similar study by Bernstein and Tiegerman-Farber (2002), 75% of children with hearing impairments could not even score 10% and yet 55% scored a passing mark in mechanical sums. In this study the percentage of children who failed story sums is less than half the percentage of children who passed mechanical sums. Similar results were established in studies carried out by Frostad and Ahlberg (1999) where, children with hearing impairments and children without hearing impairments solved fifteen numeric sums and fifteen word problems and children with hearing impairments' performance was comparable to children without hearing impairments in numerical sums but the former performed poorly in problem sums. Other studies carried out by a number of authorities, Kelly & Gaustad (2006), Taylor (2000), and Frostad & Ahlberg (1999) all indicate that children with hearing impairments perform poorly in story sums due to poor vocabulary, miscomprehension and low reading ability levels. In this study children simply added problems that needed division and multiplication. A good example is "*Mary had 56 eggs. She put them in boxes of 8 eggs each. How many boxes did she fill?*" A number of children simply added 8 to 56 and gave 64 as an answer. Where there were two or three concepts joined in one problem, children totally got lost. Numbers eight, twelve and sixteen proved very difficult for children, may be, because they involved a whole number and a fraction. All children got these numbers wrong. A study by Hooper (1998) on the concept of fractional number among children with hearing impairments had similar results. Students had a tendency to order fractions by the values of the counting numbers composing them. For example one quarter plus one half would be added to produce two sixths.

In a study carried out by Taylor (2000) where he tested children with hearing impairments on word problems, the results indicate that relational statements were either consistent or inconsistent the arithmetic operation required for the solutions. The results support the consistency hypothesis that children with hearing impairments are likely to miscomprehend a relational statement and commit a reversal error when the required arithmetic operation was inconsistent with the statement's relational term. For example having to add when the relational term was *less than*. The other problem is that of the reversal error effect with inconsistent word problems where children had to subtract when the relational statement was a positive adjective such as *more than*. A similar example in this study is how the following problem was solved. "*A farm had enough space and grazing for a herd of 1700 cattle. The herd grew to 2435. How many cattle too many is this?*" Only one child subtracted and got this problem correct, most of the children added and got it wrong most likely because of the phrase "*too many*".

As pointed indicated by (Taylor, 2000) children with hearing impairments lag behind in language development. They continue to use basic language even where complex constructions are engaged. Poor reading ability of children with hearing impairments seem to influence their performance in mathematics. A study cited by Copley (1999), indicates that when children with hearing impairments improved in reading, there was a decrease in goal-monitoring errors, multiple errors and the number of mathematical problems left unsolved. However, contrary to expectations, higher reading skills did not affect the frequency of reversal errors. Results of this study also indicate that out of eight children who scored 100% in mechanical sums none scored less than 50% in story sums. It is indicative that these children are quite capable but have language deficiencies. All children who passed story sums got 70% and above in mechanical sums. All nine children except one, who did not score any marks in mechanical similarly did not score any marks in story sums. These are children who are generally weak and have learning difficulties in addition to hearing impairments. Stuwart and Kluwin (2001) point out that of the 18% of children who have disabilities, there are some who further experience learning difficulties in addition to their disability.

Of particular interest is that where straightforward language was used children scored the highest on that number. For example the most number of pupils 40% got number 15 correct, and number fifteen was straightforward addition. "*Rain fell at Ascot on three days. 21mm fell on Monday, 19mm fell on Tuesday and 8mm fell on Wednesday. How much rain did Ascot get in three days*?" The vocabulary used in this problem is simple and most of the key words are terms used on a daily basis. Where the statements are short and precise, more children (10%) got the sums correct, for instance numbers 1, 13 and 14. Other numbers that were well done are 2 and 4 in which 13% of the children got the sums correct. Numbers 8 and 16 that involved fractions were poorly done. None of the children got these correct. There is a combination of whole numbers and fractions and as indicated in a study by Hooper (1998) referred to earlier on, fractions pose difficulties for children with hearing impairments. Everything done the correct way, language remains a limitation in the performance of children with hearing impairments in mathematics, particularly in problem solving.

8. Findings

The findings of this study clearly indicate that children with hearing impairments perform poorly in mathematics due to poor language development, poor comprehension, limited vocabulary and lack of understanding mathematical terms. This is so because children scored higher marks in mechanical sums and scored lower marks in story sums on exactly the same items.

There is need for a thorough language assessment that leads to Individualized Educational Programs. The establishment of pupils' strengths and weaknesses during assessment helps in planning instructional intervention for any student and is also important to determine whether school performance problems are related to the handicapping condition of learning disability.

9. Limitations

Poor skills and errors made by students in the four basic operations of mathematics; addition, subtraction, division and multiplication contributed towards the total marks obtained by the participants in the study. Teaching methods and relevancy of materials for the teaching of mathematics are not included in this study and yet they influence the performance of children. The degree of hearing impairment was not considered and yet it has an effect on language development.

10. Conclusions and Suggestions for Further Research

It appears that the performance of children with hearing impairments in mathematics is greatly affected by the English Language through poor comprehension, limited vocabulary and lack of understanding mathematical terms. Comprehensive results show that on items that did not need verbal language interpretation and comprehension, children performed better than on items that needed vocabulary, interpretation and comprehension in order for them to understand what the problem required.

According to the findings of this research there is need for the education sector to look into the way the English language is being taught and used in teaching Mathematics. It is necessary to start teaching children problem solving from an early age. In order for children to grasp the necessary concepts, mathematical terms and vocabulary should be used regularly. In order to improve the teaching of mathematics, particularly story sums, there is need to expose children to simple problem solving tasks using real life situations that are within children's experiences. Reading materials should have some relevancy and bearing on the language used in mathematics.

11. Suggestions for Further Research

This study left a number of areas untapped. In order to fully understand the nature of the problem caused by the influence of the English language in mathematics, all other areas have to be addressed. There is need to investigate the following;

1) The appropriateness of the methods used in teaching mathematics.
2) The effectiveness of the teaching of mathematics.
3) The relevancy of materials used to teach mathematics.
4) The language and method of assessment used to test children with hearing impairments.

We recommend these as areas of further research in order to facilitate better performance in mathematics particularly with children with hearing impairments.

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Appendix A. Story Sums

Mathematics Test for Standard Six

Final Instrument

1. What is the sum of 123, 19 and 539?

2. What is the difference between 974 and 297?

3. What is the product of 78 and 87?

4. 7500 bags of wheat were stored in a shed. 4875 of these bags were destroyed in a fire. How many bags of wheat were saved?

5. Mary had 56 eggs. She put them in boxes of 8 eggs each. How many boxes did she fill?

6. A bus makes a journey of 18 kilometers ten times a day. How many kilometers does the bus travel in one day?

7. Betty had 85 chickens. One of her hens hatched another 6 chickens. How many chickens has Betty now?

8. Mother bought 84 eggs from the supermarket. One quarter of the eggs were bad. How many eggs were bad?

9. A shoe factory made 3640 pairs of shoes in January, 5612 pairs in February and 4548 pairs in March. How many pairs of shoes did the factory make altogether for the 3 months?

10 A farm had enough space and grazing for a herd of 1700 cattle. The herd grew to 2435 cattle. How many cattle too many is this?

11. A box of 27 counters was shared among 5 children. How many counters did each child get, and how many counters were left?

12. There are 126 oranges in a box, but only five sixths of them were edible. How many oranges were edible?

13. Mr. Moyo left Gweru at 7.30 a.m. and arrived in Harare at 11.52 a.m. How long did the journey take him?

14. There were 144 pencils in a box. How many pencils were there in 25 boxes?

15. Rain fell at Ascot on three days. 21mm fell on Monday, 19mm fell on Tuesday and 8mm fell on Wednesday. How much rain did Ascot get

    in three days?

16. How many 20 liter buckets can be filled from a drum which holds 172 liters of water? How many liters would be left in the drum?

17. A lorry delivered 75 bags to the shop per day. It worked for 24 days. How many bags did it deliver?

18. What is the cost of one book if 7 books cost $49,00?

19. Twenty birds were up the tree ¼ of the birds flew away. How many birds remained?

20. Material for a dress costs $3, 65 per meter. How much would 7 meters cost?

Appendix B

Mechanical Sums

Final Instrument

(1) 65:- 8	(2) 18 x 10		(3) 85 + 6
(4) 123 19 +539	(5) 974 -792	(6) 78 x 87	(7) 7500 - 4875
(8) 27 :- 5	(9) 5/6 of 126		(10) 11: 52 a m – 7: 30 a m
(11) ¼ of 84	(12) 5612 + 4548 +3640		(13) 2435 – 1700
(14) 144 x 25	(15) 21mm + 19mm + 8mm		(16) 172 :- 20
(17) 75 x 24	(18) 49 :- 7	(19) ¼ of 20	(20) P3,65 x 7

Appendix C

Questionnaire for School Teachers

We are collecting information from teachers teaching standard six children with hearing impairments. Your school has been selected to take part in this study. Please help us by completing this short questionnaire. You do not need to write your name and all information collected will be treated in strict confidence. We encourage you to participate since this research will help point out some of the problems that teachers and children with hearing impairments face.

Please put either a tick at the end of your answer or a ring around the appropriate number on every statement of question.

International Research in Education
ISSN 2327-5499
2013, Vol. 1, No. 1

1. Gender of teacher

man	woman
1	1

2. Age:

21- 30	30- 35	36-40	41-50	51-60
1	2	3	4	5

3. Teaching experience:

1-5 yrs	6-10 yrs	11-20 yrs	21-30 yrs	31-40 yrs
1	2	3	4	5

4. Experience of teaching children with hearing impairments

1-5 yrs	6-10 yrs	11- 20 years	21-30 yrs	31-40 yrs
1	2	3	4	5

5. Number of teachers in the school by category

Specially trained teachers	Regular trained teachers
1	2

6. Highest academic qualifications

Grade 11	'O' Level	'A' Level	Degree
1	2	3	4

7. Highest professional qualifications

PTL	1
PTH	2
T4	3
T3	4
CE/Dip in Education	5
CE/Dip in Special Education	6
Degree: B. Ed/ BA/ M. Ed in General Education	7
Degree: B. Ed/M Ed in Special Education.	8

8. What type of school do you teach at?

Private	Mission	Government
1	2	3

9. If in an integrated setting indicate number of children in class by category?

Hearing impairments	Non disabled

10. If in a special school or unit indicate the number of children with hearing impairments in your class/unit?

Class	Unit

Thank you very much for your co-operation.

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International Research in Education
ISSN 2327-5499
2013, Vol. 1, No. 1

Appendix D. The Geographic Demarcations of the Towns Included in the Study

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