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Teachers' Preferences for Teaching Mathematics to Primary School Children with Specific Learning Difficulties in Harare Region, Zimbabwe

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Abstract: The present research was carried out in Harare, Zimbabwe, and its aim was to find out the opinions of primary school headteachers, mathematics remedial teachers and regular class teachers whose children received remedial help and those whose children did not on their preferences, between in-class support teaching and withdrawal teaching, as ways of teaching children with specific learning difficulties in mathematics. This was a quantitative study which used a survey design to collect data. The above were achieved through the use of a questionnaire, which was administered to all the identified respondents. The data was subjected to quantitative analysis strategies. The analysis of the four group's opinions revealed that the majority of them preferred withdrawal teaching due to the large classes, as it promoted children's mathematical growth. The four groups' mean rankings also revealed a higher ranking of withdrawal teaching as compared to in-class support teaching. Both groups of regular class teachers also preferred smaller classes as best ways as opposed to school heads and mathematics remedial teachers who indicated a higher ranking of withdrawal teaching. The study recommended that withdrawal teaching should be structured to ensure social inclusion of children and that there should be collaboration between the groups.
Keywords: specific learning difficulties, mathematics, teachers, remedial help.

INTRODUCTION

In Zimbabwe, primary education is compulsory [1-3]. This has resulted in more children coming to formal schooling. The Ministry of Primary and Secondary Education's Policy Statement on Special Education [4] has enabled more marginalised children to be educated. Mathematics is also a compulsory subject from primary up to the secondary level [5]. Kilborn *et al*. [5] point out that 'the importance of mathematics as a tool for science and technology is continually increasing'. It is vital that children become proficient in mathematics at the primary school level to create the foundation for later learning in science and technology. The statistics reveal that there was a 30% pass rate at grade seven and a 24% pass rate at Ordinary level in 1996 [5] and this trend has not significantly improved over the years.

Remedial teaching in its various guises was identified as one way of addressing the primary school failure in mathematics and language for children with specific learning disabilities. These children have average to above average intelligence but have difficulties in learning academic subjects. Remedial education became available to all primary schools in 1982[6]. The remedial programme was finally institutionalized in 1987 with the publication of C.E.O Circular Minute No.12. TheCircular requires schools to nominate two teachers from their staff for every 500 children. Each teacher would provide extra teaching twice a week in mathematics or reading to identify children with specific learning difficulties [7]. Zimbabwe has a national curriculum and assessment system. The national assessment is done at the end of the seventh year. The C.E.O Circular No. 12 points out that many children cannot read or calculate well at the end of their seventh year at school. One way they can be helped is through a mathematics and reading remedial course. About a third of schools had implemented this programme by 1987. The Secretary for Education reported in 1986 that '… remedial programmes did not operate in all schools' [8].

The development and sustenance of the remedial programme is done by Schools Psychological Services' Remedial tutors who are qualified teachers. The Zimbabwe Country Report in Nilsson [9]) sees the teacher as the most important resource in the education sector. The following are the professionals involved in remedial education in the primary school in Zimbabwe.

School Heads

Before a remedial programme starts, the school heads are involved in the selection of remedial teachers

[6]. Schools Psychological Services and Special Needs (S.P.S.&S.N.E.) staff are aware of the importance of the schools' heads in the development of the programme. The school head is always kept informed of what is happening in their school. Courses are held for school heads in order to make them aware of the programme. The school heads are supposed to monitor the progress of the programme in the schools. This is also done by S.P.S staff. If remedial teachers encounter problems in such settings, they are asked to bring these to their school heads who should try to solve them.

Remedial Teachers

Remedial teachers have classes like any other teachers in the schools. Above the duties with their classroom, is the responsibility of setting up a remedial programme with the help of the school head and S.P.S and SNE. Teachers are usually prepared for this through visits by area remedial tutors and in-service courses which are run regularly by S.P.S and SNE. Using screening tests provided by S.P.S. and S.N.E., teachers select those children who may need extra teaching from Grade 3, 4 or 5 and provide them withdrawal teaching in the a Learning Centre, at least twice a week. The remedial teachers are an important resource which can be used by the school. They are usually exempted from taking extra mural activities [6]. Area tutors visit the remedial teacher and give advice or team teach with the remedial teacher in the withdrawal setting [10]

The teaching which takes place is usually of two types; small group teaching for children with similar difficulties and the use of individualized programmes. Each child has an individual educational programme. Most of the work given to children is usually based on building mathematical concepts and problem solving and this work remains in the Learning Centre. The Secretary of Education reports that 'effectiveness of the remedial programme was measured … by the extent to which remedial programmes were actually being implemented in schools'. [8]. According to the C.E.O Circular Minute No. 12 of 1987 only a third of the schools were implementing it then.

Regular Class Teachers with Children Receiving Withdrawal Teaching

During the remedial programme, regular class teachers should cooperate with remedial teachers by ensuring that children participate in the screening and intervention programmes provided by remedial teachers. Regular class teachers should cooperate with the remedial teachers and can ask for advice from them.

The observational survey has items which ask the remedial teacher to indicate if s/he is working with the staff [10].

Regular class teachers without children receiving withdrawal teaching

Not all children receive remedial help; these include some from the target grades. The Schools Psychological Services in its booklet "A resource handbook for teachers" indicates that an average class of 45 children includes children with special needs [11]. Class teachers in this situation need a lot of support in teaching these children inside the classroom. A study by Kilborn et al [5] revealed that most primary school teachers have insufficient knowledge in mathematics when they enter teachers colleges.

Withdrawal teaching is currently in progress [6] and in-class support is in progress also, in the form of advice for both mathematicsand language teaching. This research focused on the remedial teaching of mathematics to children with specific learning difficulties.

Statement of the Problem

There are two ways in which children with specific difficulties can be provided for by remedial teachers. First this can be through withdrawal teaching or "remedial teaching" as it is better known and second through in-class support teaching together with the regular class teacher. What is the preferred way of teaching mathematics which would be suitable in the Zimbabwean context?

Purpose of the Study

The purpose of this study was also to obtain information which would aid support services and schools, in formulating practices, to maximize teachers' effectiveness with special needs children.

Research questions

In order to address these issues, the present research sought answers to these three questions, which dealt with ways of teaching children with specific learning difficulties in mathematics.

1. What are school heads, remedial teachers and regular class teachers' opinions towards the help they get in teaching children with specific learning difficulties in mathematics?
2. What type of teaching do the above groups prefer: withdrawal teaching or in-class support?
3. How can this be improved?

REVIEW OF RELATED LITERATURE

Remedial education in the form of withdrawal teaching has undergone changes in the United Kingdom education scene [12] and this has cascaded to countries like Zimbabwe. Doubts of its effectiveness have necessitated the change towards varied types of support, one of them being in-class support with the remedial teacher helping.

The school head is mentioned as important in the implementation of the integration and inclusion of children with special needs [13; 14]. Policies in many countries pointed to the need to educate children with special needs in the mainstream. Indeed, this trend has been in progress in the U.S.A. and Britain [15; 16]. The role of withdrawal teaching is still there [17-19]. It is seen as effective in the form of short term intensive interventions. These short term intensive interventions may have a short term effect on the children. Mathematics teaching should be tailored to the needs of the child. The curriculum of the children should be suitable to their needs.

Remedial teachers still withdraw children for remedial teaching mainly because class teachers fail to cope with the many demands placed upon them. Desforges and Cockburn, [20] gave examples of the nature of the demands placed on the class teacher. The teacher is supposed to pay attention to all the needs of the children and this is not possible. Also in the Regular Education Initiative the responsibility of educating the child has been placed on the teacher, including organizing the withdrawal teaching of the child for extra help [15].

Ireson, Evans, Redmond and Wedell [21] in a study of 10 primary schools found out that most Heads preferred withdrawal teaching to various factors in the schools. Although remedial teaching and support teaching has been influenced by policy, teachers still prefer withdrawal teaching for children with special needs[22; 17]. Condren, et al, [19] in a study done in Ireland found out those regular classroom teachers did not have the time to address the needs of children with learning difficulties.

The preference for in-class support teaching is influenced by the social acceptability of the child. The social development of the children may be enhanced by in-class support teaching, because the children may not be labeled and this may enable them to participate in groups inside the classroom. Despite this most class teachers according to Moses, Hegarty and Jowett, [23] still prefer withdrawal teaching. Research is inconclusive on the academic development of the children although intensive withdrawal teaching has some positive effects on some children [12]. The importance of remedial teachers is based on how much they affect the regular classroom teachers they work with. If attitudes are important to in-class support teaching then school heads, remedial teachers and regular class teachers will have to undergo pre-service or in-service training.

In-service training does have a positive effect on the attitude of principals and teachers [24]. Views of teachers towards the in-service training are not clear although principals see it as an important component of preparation.

METHODOLOGY

Research design

This was a quantitative study which used a descriptive survey design. This made it possible to reach as many participants as possible within a short period. The use of a survey enabled the gathering of information at a particular point in time, from a larger number of people quickly and economically [25; 26].

Population and Sample

This study was carried out in Harare, the capital city of Zimbabwe which has a population of over two million people[27]. School going children with disabilities have increased tremendously from 1980 to 2007 by 8819%[28].The population consisted of 120 teachers from 30 schools in Harare.

Stratified sampling [29] was used to select schools heads, mathematics remedial teachers, regular class teachers with children receiving remedial help and regular class teachers without children receiving remedial help. The sample consisted of seventy six (76) participants from nineteen (19) schools.

Instruments

A questionnaire was used to collect data. Although the ideal questionnaire is difficult to construct, the main considerations were taken in its construction [30]). The questionnaire had three sections each for the school head teachers and the class teachers. It used a Likert scale for the closed questions [31]. The questionnaire consisted of items from Gipps, Gross and Goldstein's [32] questionnaire and Larrivee and Cook's [33] instrument; on how children with special needs in primary schools are taught and teacher attitude towards children with special needs. All ethical and legal considerations were adhered to by seeking permission from the authorities and also ensuring confidentiality of all the participants and schools.

Data collection, analysis and presentation

All questionnaires were completed at the different schools under the supervision of the researcher and assistants. This research used both descriptive and inferential statistics. A statistical analysis using the Chi-square was carried out on the cross tabulations for the items, between the four groups in the sample. An analysis of variance using the F-ratio was used to test for significance between the four groups on the opinion statements [34]. A frequency count of the positive and negative responses was done. The entire sample's preference was indicated by the side which had the highest percentage. Measures of central tendency were used for the rankings between the four groups. Differences between the group's mean rankings indicated the differences between the groups. The

entire sample's rankings were put together to ascertain the whole group's preferences.

RESULTS

The questionnaire overall return was 99% with only one respondent out of 120 not replying. However, 76 or 63% of the responses were used in the present study. These 76 respondents represented only those teachers from nineteen schools which had provided four members of staff required in the study to complete the questionnaire.

A large percentage, 74.7%, of the respondents came from the schools formerly called Group "B" schools (High density urban area). The former Group "A" schools (medium to low density urban area) had 26.3% of the respondents. The sex distribution for respondents was 66.2% women and 33.8% men. This quantitative analysis showed that of the 19 regular class teachers with children receiving remedial help 16 of them taught Grade 4. An analysis of all the grades taught indicated that 27 teachers taught Grade 4 which is the target of the S.P.S. and SNE remedial programme.

Are there any significant differences between the groups on their opinions?

An analysis of variance using the F-ratio was used to find if there were any statistically significant differences between school heads, mathematical remedial teachers, regular class teachers (R.C.T.1) and regular class teacher (R.C.T.2) on the opinion statements. Table 1 shows the variable means, standard deviation, degrees of freedom and the F-ratio.

Table-1: Analysis of differences between groups in the major variables using the F-Ratio

Variable No.	Cases	Mean	Standard Deviation	Degrees of Freedom	F
7	74	2.35	1.22	3	1.61
8	73	2.25	1.15	3	1.68
9	75	3.97	1.22	3	0.68
10	75	3.48	1.19	3	0.83
11	74	3.19	1.14	3	0.21
12	75	2.51	1.27	3	0.58
13	75	4.05	1.06	3	0.61
14	75	2.83	1.17	3	1.34
15	74	2.28	1.05	3	1.32
16	75	4.19	0.83	3	1.07
17	75	2.33	0.87	3	1.28
18	75	3.81	1.03	3	0.68
19	75	4.32	0.77	3	0.08
20	75	4.62	0.50	3	0.10

N=76

*significance was measured at both 1% and 5% levels

There were no statistically significant differences between the mean scores of the four groups at either the 1% or 5% probability level.

What type of teaching do the groups prefer between in-class support and withdrawal teaching?

The results of the quantitative analysis, on Table 2 of school heads, remedial teachers and regular class teachers' responses indicates the percentage for withdrawal teaching, in-class support teaching and those who were uncertain.

Of the total responses on the opinion statements the preferred location for teaching children with specific learning difficulties in mathematics were 54.5% for withdrawal teaching and 38.3% for in-class support teaching and 7.2% were uncertain. Specific variable variation can be observed in Table 2, by the percentage responses for "best place" and "Social Acceptability" in which the majority of the entire sample preferred in-class support teaching over withdrawal teaching.

Are there any differences between the groups on the ranking scale?

Withdrawal teaching was preferred throughout more than in-class support teaching by all the four groups.

Table 3 gives a summary of heads' and teachers' mean rankings, which confirm that withdrawal teaching was viewed as better than in-class support teaching.

In-service courses and advice to teachers were ranked higher than in-class support teaching.

Table-2: Heads and Teachers' Preferences on Major Variables: Percentage of Frequencies

Variable Name and number		N	In-Class %	Withdrawal %	Uncertain %
"Best Place" for teaching	7 10	74 75	49	43.6	7.4
"Mathematical Growth" best achieved	8 16	73 75	41.2	55.4	3.4
"Policy" of Ministry should be	12 19	75 75	34	59.3	6.7
Class Size effects	13 20	75 75	7.3	90.7	2.0
Expertise is evident	14 20	75 75	37.3	54.0	8.7
Modified Curriculum is best used	15 18	74 75	43.6	47.0	9.4
Social Acceptability is possible	17 11	75 74	55.7	31.5	12.8

N= 76

Table 3 A Summary of Heads 'and Teachers' Mean Rankings

Variables	Mean Rank	S.D.	Rank Order
Smaller Classes	2.5	1.6	1
Withdrawal	2.7	1.7	2
In-Service Courses for Regular Class	3.5	1.5	3
Advice on Methods/Strategies for Remedial Teacher	3.7	1.4	4
In-Class support	4.1	1.6	5
Remedial Teacher Assisting in the Class	4.5	1.4	6

N= 76

The sample consisted of equal numbers of school heads, remedial teachers, regular class teachers whose children receive withdrawal help (R.C.T.1) and regular class teachers whose children do not receive remedial help (R.C.T.2) making up 63% of the returns. Of the above, 51.3% found the help got as either adequate or good. No significant differences were found between the groups on the opinion statements. A quantitative analysis of the opinion statements showed that 54.5% respondents preferred withdrawal teaching as opposed to 38.3% for in-class support teaching. The mean rankings for the groups, indicated that withdrawal teaching was viewed to be better than in-class support teaching

DISCUSSION

Opinions on the help received in teaching children with specific learning

The quantitative analysis of the results, of the tabulation, indicated that slightly more than half of the sample either rated the help they received adequate or good. There was an indication that school heads and remedial teachers were managing with the help they got. There is need to be aware that the three groups received different types of help and this may account for the reason why all groups were satisfied. These results were not in keeping with those found with other studies. Gipps et al. [32] found that teachers were not satisfied with the help they received. Center et al. [24] also found that principals were not satisfied with the support services they got.

These results must be treated with caution, because they asked regular class teachers their feelings towards the help got not the help children got in the withdrawal or in-class settings. Further research using interviews and classroom observations are needed to get a clear answer. To a large extent school heads, remedial teachers and regular classroom teachers receiving help were satisfied with the help they got. This finding illustrated that existing remedial programmes were appreciated by a large number of their recipients.

What type of teaching do the above groups prefer: withdrawal or in-class support?

The analysis of statistical significance indicated that there were no significant differences between the four groups on the opinions statements. The results of the qualitative analysis done on the opinion statements, for the entire sample's preferences will be discussed in this section.

The whole group response revealed that withdrawal teaching was the preferred mode by the majority of them. According to the analysis only a few respondents were for in-class support teaching. This trend was similar to other research in this area [32; 23; 12].

The specific items reveal that he majority of the entire sample also preferred the withdrawal set up for the mathematical growth of the children. This variable seems to be connected to teacher expertise and class size. This concurs with Condren et al [19] who say that if teachers have no expertise, then it is obvious that they will tend to transfer these responsibilities to another person. Research indicates that it is difficult to prove the academic effectiveness of different settings [13]. Teachers indicated that children would perform academically better in a segregated setting. There is need to identify how academically effective remedial programmes have been in Zimbabwe.

A minority of the responses indicated also a preference for in-class support teaching. This signifies that there are group members who view both methods to be appropriate in teaching children with specific learning difficulties in mathematics. Research is beginning to indicate that there is a need to have these two methods side by side [21; 12). Garnett [17] advocates for intensive withdrawal teaching, for specific cases when an in-class support system is in progress. Although the attitude of school heads and teachers, can be termed negative, a sizeable minority are beginning to be aware of the need for in-class support for both the regular class teacher and the child with special needs. This would be in line with inclusive education.

CONCLUSIONS AND RECOMMENDATIONS

The study made the following conclusions:

- Withdrawal teaching was preferred by the whole group as opposed to in-class support teaching because of regular class teachers' lack of expertise in dealing with the children, and the existence of large classes.
- Both groups of regular class teachers differ from school heads and remedial teachers in that they rank small classes first and withdrawal teaching second whilst the latter rank withdrawal teaching first.
- After withdrawal teaching teachers prefer in-service training better than in-class support teaching.

These recommendations were made:

- Withdrawal teaching should be structured in such a way that children are not socially disadvantaged by linking it to the children's classroom.
- There should be clearly defined collaboration between the different professionals assisting the children with specific learning difficulties in mathematics.
- Regular teachers should receive in-service training in order to equip them to meet the needs of children with specific learning difficulties in mathematics in their classrooms.
- Research should be carried out to determine the effects of reducing class sizes to meet the needs of the child in the regular classroom.

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