GENDER DIFFERENCES IN GRADE SEVEN MATHEMATICS RESULTS IN KANYONGO CLUSTER SCHOOLS: CAUSES AND SOLUTIONS

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ABSTRACT

The study sought to investigate gender differences in the Zimbabwe Schools Examination Council (ZIMSEC) grade seven mathematics results in Kanyongo cluster schools Mutoko district, Mashonaland East Province, Zimbabwe. The quantitative research design was used in the study. The sample consisted of 120 grade seven learners and 15 teachers from Kanyongo cluster primary schools. Semi-structured questionnaires were administered to the learners and structured interviews were held with the teachers. The study revealed the main causes associated with gender differences in mathematics results at grade seven in Kanyongo cluster schools to, inter-alia, be: inadequate teaching resources in schools, girls' lack of time to do mathematics homework as compared to boys, teachers giving more chances to boys than girls to solve mathematics problems on the chalkboard, teachers beliefs that boys were better than girls in mathematics at grade seven and parents' expectations of boys to pass mathematics better than girls at grade seven. The research recommended that: teachers should often carry out cause-effect-analysis of mathematics results and immediate corrective action should be taken to address any gender differences if found; teachers should redirect learners, particularly girls, so that they understand that gender is not the driving force in successful learning of mathematics; schools mathematics teaching resources availability needs improvement; awareness campaigns should be held to reveal gender disparities and their causes in mathematics learning; more grade seven classes should be allocated to female teachers; learners, especially girls, should be helped to build confidence in themselves and their potentials in seemingly difficult areas such as mathematics and there should be greater co-ordination amongst the schools stakeholders in improving service delivery in mathematics teaching.

Keywords: Gender differences, quantitative research, stratified sampling, culture and genetics

INTRODUCTION

The present researchers had noted that boys tended to do better than girls at the final primary school (grade seven) mathematics examinations in Kanyongo cluster schools in contrast to the national results.As indicated by the available statistics, girls outclassed boys in the national Zimbabwe Schools Examination Council (ZIMSEC) grade seven mathematics examinations for three years over a period of four years from 2006 to 2009 as illustrated in table 1.

With such a scenario, the researchers were interested in finding out the causes of gender differences in mathematics results at grade seven for the Kanyongo cluster schools. Finding out the causes of gender differences in mathematics pass rate is important as mathematics is undoubtedly one of the most difficult subjects in the primary school curriculum (Clark, 2010).

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Several variables could have contributed to the lower pass rate at the ZIMSEC grade seven national mathematics results for girls where they were outperformed by boys in Kanyongo cluster schools. This is why it was important for these researchers to investigate those variables that contributed to the lower mathematics pass rates. Jo-Anne and Manswell (2001), as well as Weaver and Qi (2011) reveal that socio-cultural backgrounds, household chores and teachers' attitudes, among others, affect pupils' learning and consequently mathematics results.

Table 1. ZIMSEC grade seven mathematics examination results from 2006 to 2009

Year	*Gender*	*Number of candidates for the examination*	*Number of candidates scoring 1 to 6 units in each of the 4 subjects*	*National % pass rate*
2009	*Female*	*137 136*	*29 539*	*21..54*
	Male	*135 137*	*25 217*	*18.66*
	TOTAL	*272 273*	*54 756*	*20.11*
2008	Female	132 205	42 218	32.69
	Male	126 779	35 093	27.68
	TOTAL	*258 984*	*78 311*	*30.24*
2007	Female	141 508	42 722	30.19
	Male	136 985	54 603	39.86
	TOTAL	*2789 493*	*97 237*	*34.95*
2006	Female	137 733	57 449	41.71
	Male	135 401	47 716	35.24
	TOTAL	*273 134*	*105 165*	*38.50*

Adapted from ZIMSEC grade seven mathematics national results analysis (Ndanga, 2010).

As shown in table 1, girls had set a precedent at national level that they were better than boys at mathematics in Zimbabwe in three out of the four years (Coltart, 2010). Thus, from this evidence, mathematics was seen to be associated with gender differences in terms of pass rates. Hence, it was imperative to investigate causes of gender differences in the mathematics results between the two sexes at cluster level so that they could be remedied where possible.

BACKGROUND

Contrary to the national results depicted in the introduction, table 1, during one of the present authors' vast experience in teaching grade seven classes in Kanyongo cluster schools girls always lagged behind boys in mathematics especially in spatial skills. This reflection is in agreement with the Kanyongo cluster of schools ZIMSEC grade seven final mathematics examination results for 2009 to 2011, revealed in table 2 below.

Unlike in 2006, 2008 and 2009 when nationally girls had the upper hand, the 2007 scenario in which boys outclassed girls in the grade seven mathematics results at national level (table 1) obtained for the Kanyongo cluster schools in 2009 to 2011. This scenario obtained for all the schools in the cluster for all the three years except for Kanyongo Cluster School 3 (KCS 3) in 2009 and 2011. Grade seven ZIMSEC mathematics results analysis is premised on performance which is judged on the basis of units a candidate scores (Ndanga, 2010).

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Table 2. ZIMSEC Grade Seven Mathematics results pass rates by gender for Kanyongo cluster schools from 2009 to 2011

			UNITS									*TOTAL*	*%PASS*	*% FAILURE*
YEAR	*SCHOOL*	*GENDER*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*			
2009	KCS I	F	0	2	3	2	5	2	4	5	7	30	46.7	53.3
		M	1	2	4	3	8	4	4	4	3	33	66.7	33.3
	KCS 2	F	1	2	0	0	2	5	6	4	8	28	35.7	64.3
		M	2	1	2	2	3	7	6	7	3	33	51.5	48.5
	KCS 3	F	1	3	3	6	9	4	6	0	0	32	94.1	5.9
		M	3	6	3	8	5	6	3	0	0	34	91.1	8.9
	KCS 4	F	0	2	1	1	3	3	4	6	5	25	40	60
		M	1	2	2	3	4	5	3	4	6	30	56.7	43.3
2010	KCS I	F	1	0	0	3	3	8	14	2	3	34	44.1	55.9
		M	1	1	1	4	5	7	10	3	5	37	51.4	48.6
	KCS 2	F	1	1	0	2	2	6	9	5	4	30	40	60
		M	0	0	1	1	2	10	4	7	3	28	50	50
	KCS 3	F	3	6	4	3	8	4	4	0	0	32	87.5	12.5
		M	5	7	4	5	6	6	3	0	0	36	91.6	8.3
	KCS 4	F	0	1	1	1	2	5	2	4	6	22	45.5	54.5
		M	0	2	1	2	5	7	4	3	4	28	60.7	39.3
2011	KCS I	F	0	2	1	2	5	4	8	6	5	32	40.6	59.4
		M	0	1	3	4	5	6	6	8	2	35	54.3	45.7
	KCS 2	F	0	3	3	2	4	6	6	7	7	38	47.4	52.6
		M	0	5	2	4	2	10	7	8	5	43	53.5	46.5
	KCS 3	F	3	2	7	6	12	2	2	0	0	34	94.1	5.9
		M	4	4	8	7	10	3	3	0	0	39	92.3	7.7
	KCS 4	F	0	0	4	1	3	4	5	3	3	23	52.2	47.8
		M	0	1	2	0	2	10	4	5	4	27	55.6	44.4

Adapted from ZIMSEC Mathematics Grade Seven results analysis for Kanyongo cluster schools by Katsvairo (2010), Mutoko District Education Office

KEY

KCS I = Kanyongo cluster school 1, KCS 2 = Kanyongo cluster school 2

KCS 3 = Kanyongo cluster school 3, KCS 4 = Kanyongo cluster school 4

A score of up to 6 units is regarded as a pass. Kwenda (2008) reveals that mission boarding schools have better ZIMSEC mathematics results when compared to rural schools. KCS 3 was a church boarding school and the other three were council day schools. Thus, mathematics results for the cluster schools at grade seven, where boys had the upper hand, were in the main the opposite of those at the national level, where girls dominated, in terms of the pass rates. Further, the present researchers had noted from experience and findings from researchers like Gordon, (1995) that the belief generally held by people that girls are not as good as boys at mathematics at grade seven also existed among some primary school

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teachers including those in Kanyongo cluster schools. The present researchers observed that group leadership posts in mathematics lessons were occupied mostly by boys and that mathematics displays of the best learners' work were occupied more by the boys than the girls' work. However, Rwodzi, (2006:434), found out that whilst female form 3 learners lagged behind their male counterparts in the percentage of those with positive attitudes towards mathematics in Zimbabwean schools, the gap, like in European countries was small. These observations and research findings, inter alia, are what motivated the present researchers to carry out an investigation at the Kanyongo cluster schools in order to get an insight into the gender differences in mathematics results, focusing on the causes and possible solutions to them.

STATEMENT OF THE PROBLEM

Several variables such as attitude towards mathematics, resources and school type, among others, have been found to cause gender differences in mathematics examination results (Finn and Pannoza, 2004; Massey, 2007; Jones, Riechard and Mokhtari; 2011, and Mertz, 2011). Gender differences in mathematics examination results at grade 7 can have negative implications for a learner's high school subjects and consequent professional and job market fate. Thus, it's of paramount importance to constantly investigate causes of gender differences in mathematics results and possible solutions as these would aid remedial action being taken.

SIGNIFICANCE OF THE STUDY

The present research sought to discover the causes of gender differences in mathematics results at grade seven at Kanyongo cluster schools. The study aimed at educating teachers, school administrators and parents, among others, to adopt educational practices that would not give advantages to one sex over the other if this was happening. Also, learners' levels of confidence and self-esteem could be positively influenced by the realisation of the causes and solutions of gender differences in mathematics results at grade seven. Furthermore, learners at a tender age could be oriented for future careers without gender prejudices if causes of their gender differences in mathematics would have been revealed. The society at large would also benefit as it would be made to realise the value of dealing with children impartially especially in issues of socialisation as regards their learning of mathematics irrespective of gender, hence shifting away from barriers aligned to one's gender that could be hampering successful learning in mathematics.

LITERATURE REVIEW

Academic dialogues pertaining to gender differences in mathematics results have created heated debates in many parts of the global village and across cultures. Since time immemorial, the study of gender differences has constantly reflected the nature of males and females with regards to learning on the basis of gender, especially in mathematics achievement (Guiso, Monte, Sapienza and Zangales, 2008). Schaefer (2004) contends that early philosophical speculation emphasised the inequality of the sexes on all dimensions of social life. Jacobs, Gawe and Vakalisa (2000) allude to the assertion that sexual differences are strongly reinforced by gender roles that are adopted by individuals as a result of unconscious or conscious pressure applied by their environments during early childhood. Dyanda and McLane (2000) believe that the socio-cultural environment shapes the learning process of the child. Schaefer (2004) concurs with Heward and Bunwaree (1999) in stating that cultural beliefs reinforce gender stereotypes between boys and girls. Similarly Huitt (2009), Hyde and Lina (2006) respond to dichotomies between men and women by

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emphasising that gender differences in learning are contextualised, that is, the existing cultural typification of gender. Cultural practices lead to girls' low self-esteem and have a detrimental impact on schooling (Schaefer, 2004). Roles children take up in the society are through the process of socialisation. Friedman and Kass (2002) add to the above by saying that children learn through observing or imitating adults. A study carried out by Zekele (2000) with some Ethiopian secondary school children revealed that boys and girls achieve differently in mathematics due to the cultural context where they were brought up and in that culture; girls were viewed as responsible for household chores just like girls in Sri Lanka. Consequently in such a situation, girls lacked the necessary encouragement and assistance from their parents at home and their teachers at school (Gutbezahl, 1995) and they were not given adequate time for homework and mathematics was regarded as a male discipline and consequently their mathematics results ranked lower than that of boys. Korean children, whose culture conceptualises mathematics problems differently from Western cultures, do better at solving multi-digit addition and subtraction problems than their North American counterparts (Martin, Carlson and Buskit, 2009).

However, on the other hand gender differences in learning performance are alluded to biological differences between males and females. Clark (2010), Githua and Ngeno (2004), Heward and Bunwaree (1999), among others, are in agreement that biologically, females are less mathematically capable than males and this is constant across populations. Engler (2003) accentuates that the epigenetic systems theory emphasises the idea that many gender differences are biologically based. It is supported by research in neuro-biology, which finds biological differences in the brains of males and females (Thompson, 2001). The corpus callosum, for example, which connects the brain's two hemispheres, is larger in women than in men and does not give them the edge in mathematical computation (de Groot, 1999 in Kosslyn and Rosenberg, 2006). Further, females generally have linguistic superiority over males but boys outperform girls in spatial activities (Myers, 2003). Overall, brain maturation appears quicker in females than in males. However, it is important to note that biological inputs alone cannot account for the bulk of sex differences because if so, we would expect similar sex differences in all cultures (Timer, 2008). Actually, Ormrod (2008) is of the opinion that full scale intelligence quotient (IQ) devised by Binet (1857-1911), Simon (1873-1961) and Wechsler (1958), among others, revealed that the IQs of males and females of a given age are almost identical. Mean IQs of males increase slightly after age six while the female mean tends to go down (Kubiszyn and Borich, 2010).

On yet a different note though, Heward and Bunwaree (1999) posited that research, especially in East Gojjam in Ethiopia, consistently revealed that males received more teacher attention than females in mathematics. Earlier on Gordon (1995) had accentuated to the notion that, girls' perceptions of their mental and physical abilities or lack of these in comparison with boys appeared to be strongly influenced not only by their parents and wider society but by the teachers. In elementary schools, boys were five times more likely than girls to receive attention from classroom teachers (Githau and Ngeno, 2004). Furthermore, boys were more likely to be praised for the intelligence of their work while girls were more likely to be commended for their neatness (Schaefer, 2004). In addition to this, Daceyand Travers (2004) documented that teachers interacted more with boys than with girls. Aggarwal (2001) had reported earlier on from several studies that it is very likely that the structure of the classroom interactions themselves creates ability differences among students.

Approaches to teaching and learning have also been found to contribute to gender differences in attainment. Boys benefit from conventional teaching strategies (whole class instruction) and competitive reward structures while girls benefit from strategies using co-operative and hands on activities (Jones, Reichard and Mokhtari, 2010). It is therefore, of paramount

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importance for teachers to cater for different learning styles as used by, for example, divergent and convergent learners as advocated by (Eggen and Kauchack, 2010). However, this should not be overdone because, as Tuckman and Monetti (2011) contend, there is some similarity of learning styles between boys and girls. Hence, the teacher should not bring about negative results by overly allowing learners to learn according to their inclined gender stereotypes in solving mathematical problems.

Various other variables have also been found to cause gender differences in learning, for example the type of school attended by the learners. More females choose to study science subjects and do better in them at single sex schools or classes than in co-educational environments (Slavin, 2012). Further, Alausa (2001) asserts that in Namibia female students taught by female teachers had more favourable dispositions towards mathematics than students taught by male teachers.In the United Kingdom most females researched on in schools felt that mathematics would not be useful to them in future (Fennema and Tartre, 2011) and that in contrast, males thought that mathematics was useful for their future plans. In the United Kingdom, Lim (2002) in Haylock (2006) identified three widely claimed myths about mathematics: that mathematics is a difficult subject; is only for clever people and that it is a male domain.

However, according to Hansen, (2011) learning difficulties in mathematics affect both sexes equally. Further, Fennema and Tarte (2011) found out that confidence, verbal and spatial visualisation consistently positively correlated with mathematics achievement for both males and females. Nevertheless though, although the "boys do better than girls" notion may be fast disappearing in whole in school subjects, mathematics and the sciences continue to be dominated by boys (Hansen, 2011). According to Tyner and Green (2005) statistics in England show that girls out-perform boys at ages 7-14 in all subjects except sciences. However, past and present studies by Finn and Pannozza (2004) in the United States of America in elementary schools have shown some inconsistencies in mathematics results between boys and girls, a scenario which the present researchers found to be obtaining in Kanyongo cluster of schools.

The discussion above clearly reveals that there are bound to be intricate gender differences in the learning of mathematics (like for other sciences) and that this is a universal issue. Therefore, this study seeks to investigate into this intricate issue by establishing the causes and solutions to gender differences in mathematics results in Kanyongo cluster schools.

METHODOLOGY

The study employed the quantitative research design which has a chief advantage of using techniques which often yield conclusions, from mainly statistical data that are projectable to the population. In this way, objectivity of research findings is more guaranteed O'Neil (2006). The quantitative research design allowed the use of the descriptive research survey with the sample. The descriptive survey focuses on the systematic exposure of the salient aspects of a phenomenon (Joan, 2009). The sample was made up of 25% of the population. According to Creswell (2012) 25% of the population provides an adequate sample size and the greater the percentage the better. The population for the present study comprised of four hundred and eighty-three grade seven pupils and fifty-eight primary school teachers. Random sampling was used to come up with the three out of six council day schools and purposive sampling to include the only church boarding school available. Stratified random sampling was then used to come up with 120 (59 female and 61 male) grade seven learners and 15 grade 7 teachers (7 female and 8 male) in accordance with their proportion in the population. Semi-structured questionnaires were used to collect data from grade seven learners and

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structured interview schedules from grade teachers. The structured parts of the questionnaires and interview schedules were mainly used to generate quantitative data whilst the unstructured parts generated qualitative data which complemented and reflected on the quantitative data. The items of both the interview schedules and questionnaires consisted of issues of gender differences about learning mathematics which include: interest, participation, performance, ability, self-esteem, socialisation, confidence and attitude. The items were also based on the Likert type scale of agreed, disagreed and so on. Likert type items facilitate reliability of the items which in turn enhances their validity and strengthens the research's credibility.

RESULTS AND DISCUSSION

Below the research findings are presented and discussed.

Table 3. 2009 Grade seven mathematics results per school

	CANDIDATES		*PASSED*			
	Girls	*Boys*	*Girls*	*%*	*Boys*	*%*
KCS 1	30	33	12	40	18	54.5
KCS 2	28	33	5	17.9	10	30.3
KCS 3	32	34	22	68.8	25	73.5
KCS 4	25	30	7	28	12	40
	Mean percentage pass			38.7		49.6

- In 2009, the percentage passes for boys in all the schools were higher than those for the girls.
- The difference in the percentage passes between the boys and girls were quite significant and least in KCS 3 (the church boarding school).

Table 4. 2010 Grade seven mathematics results per school

	CANDIDATES		*PASSED*			
	Girls	*Boys*	*Girls*	*%*	*Boys*	*%*
KCS 1	34	37	7	20.6	12	32.4
KCS 2	30	28	6	20	4	14.3
KCS 3	32	36	24	75	27	75
KCS 4	20	27	5	25	10	37
	Mean percentage pass			35.2		39.7

- In 2010, the scenario was different from that for 2009.
- Whilst at KCS 1 and KCS 4 girls were outclassed by boys, it was the reverse at KCS 2 and the girls had the same percentage pass with boys at KCS 3.

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Table 5. 2011 grade seven mathematics results per school

	CANDIDATES		*PASSED*			
	Girls	*Boys*	*Girls*	*%*	*Boys*	*%*
KCS 1	33	35	10	30.3	13	37.1
KCS 2	38	43	12	31.6	13	30.2
KCS 3	34	39	30	88.2	33	84.6
KCS 4	23	28	8	34.8	5	17.9
	Mean percentage pass			46.2		42.5

- In 2011, the pattern of the results was more the reverse of that for 2010.
- At schools KCS 2, KCS 3 and KCS 4 girls outperformed boys; only at KCS 1 did boys perform better than girls.

Various other findings about gender differences in the learning of mathematics at Kanyongo cluster schools were revealed during the research. Although the majority of the pupils, 92.5%, (46.7% boys and 45.8% girls) stated that they were interested in doing mathematics, they indicated that more boys than girls were called up by teachers, to work out mathematics problems on the chalkboard. This issue was also indicated by 62.5% (25% female and 37, 5% male) of the teachers versus 18, 75% female and 18, 5% male teachers who disagreed. This not only gave the boys the practice but boosted their self-esteem, interaction with the teacher and their consequent performance in the subject, just also as found out by Sadker, Sadker and Klein in Woolfolk, (2010). Further, grade seven girls from the church boarding school performed better than girls from the council day schools. The council day schools girls pointed out that they did not have enough time for homework because, as also found out by Heward and Bunwaree (1999) and Zekele (2000) they were viewed as responsible for domestic duties at home. The church boarding school was also indicated by the teachers to be better resourced than the day council schools.

92, 5% pupils (45, 8% boys and 46,7% girls) indicated that they got assistance with their mathematics homework at home. This put the majority of the respondents at par on this issue unlike the situation in a study by Mataruse (2002) where it was found that boys got more assistance with their homework than girls. However, despite the assistance boys still outperformed girls maybe because of lack of time due to domestic chores as indicated by 65, 8% pupils (42.5% girls and 23.3% boys). Most of the girls attended the council day schools. Further, despite that the majority of the pupils, 94, 1% (48.3% girls and 45, 8% boys), indicated that teachers built their interest in mathematics and 74, 1% (35% girls and 39, 1% boys) preferred male teachers, homework assistance for girls was mainly from females whilst for boys it was mainly from males. This should have advantaged both boys and girls because same sex homework instructors help to raise girls' mathematics self-concept (Githua and Ngeno, 2004). However, regardless of the equity enjoyed in assistance rendered to both boys and girls in their mathematics homework, the girls' lower percentage rate could be a result of attitude. 30.8% (girls) stated that boys were better than them at mathematics with 50%(boys) indicating they were better than girls. By thinking that boys outperformed them, girls were actually prepositioning themselves and accepting to play second fiddle to boys in mathematics. Girls have been found to underestimate their chances of success in mathematical tasks while boys even overestimate them (Kopp and Krakow, 2009). Girls'

failure to believe in themselves was also revealed when 84.2% of them believed that they would pass mathematics in the grade 7 final examinations as compared to 95% of the boys. Beliefs have been found to influence performance (Mahmud, 2009).

More boys (31.6%) than girls (19.2%) preferred to do mathematics as a hobby than anything else and they felt passing was out of ability, quite consistent with findings by Fennema and Tartre (2011) where negative attitudes towards a subject caused low pass rates or even failure. Research has also found boys to be more interested in and to perform better than girls in sciences, especially at post primary school levels (Ncube (2013:14). This seemed to be worsened by the teachers,81, 25% (31, 25% female and 50% male), who believed that boys outperformed girls in mathematics while 12, 5% female and 6, 25% male teachers disagreed. This advantageous position of boys over girls was more authenticated by that 56, 25% (12, 5% female and 43, 75% male) teachers agreed that some parents' attitudes towards schooling favoured boys while 31, 25% female and 12,5% male disagreed.

Many teachers, 56, 25% (12, 5% female and 43, 75% male) indicated that parents gave more preference to boys with regards to educational attainment at the expense of girls. Because parents expected boys to pass, the teachers argued that they were likely to behave in ways that were beneficial to boys' mathematical development, for example providing gadgets that built their confidence in spatial operations (similar to Hyde in Mataruse, 2002's finding) and encouraging boys to be more active and achievement oriented than girls, just as Frisch in Kopp and Krakow, (2009) also found out. Further, girls failed Mathematics because of the teaching strategies used by the teachers just like Arends (2007:74) found about American classrooms. The findings also showed that: more boys helped girls with mathematics calculations than vice-versa, 68, 75% (25% female and 43,75% male) teachers agreed that some Non-Governmental Organisations (NGOs) gave educational assistance in mathematics to boys more than girls while 25% (12, 5% female and 12, 5% male) teachers disagreed, 68, 75% (25% female and 43, 75% male) teachers agreed that mathematically oriented jobs were a male domain while 25% (12, 5% female and 12, 5% male) teachers disagreed and 50% (18, 75% female and 31, 25% male) teachers agreed that boys frequently did their mathematics homework more than girls while 43,75% (18, 75% female and 25% male) teachers disagreed. According to Lim (2002) in Haylock (2006) mathematics has been believed to be a male domain.

Further,81, 25% teachers (37, 5% female and 43, 75% male) agreed that girls and boys have the same ability in mathematics (while 6, 25% female and 12, 5% male teachers disagreed) and 68, 75% (37, 5% female and 31, 25% male) teachers agreed that boys and girls employed the same learning styles in mathematics (while 25% male 0% female teachers disagreed). However, despite this: 87, 5% (43, 75% female and 43,75% male) teachers agreed that mathematics phobia affected girls and boys differently (while 12, 25% (male) teachers disagreed), and 25% (6, 25% female and 18, 75% male) teachers agreed that teachers built more confidence in boys than girls in mathematics (while 37, 5% female and 37,5% male teachers disagreed).

Thus, this issue of gender differences in the learning of mathematics was influenced by an intricacy of variables. Out of this intricacy however, the scale tilted towards the revelation by 75% (31, 25% female and 43,75% male) teachers who indicated that mathematics results were influenced by gender while only 25% (12, 5% female and 12, 5% male) teachers disagreed. The teachers indicated that the gender influence scale tilted in favour of boys whom they believed that they had an advantage over the girls in terms of positive: teachers' attitudes towards them, parents' socialisation practices with them and self-esteem.

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CONCLUSIONS

From the findings of the study, it was concluded that boys performed better than girls in mathematics at grade seven in Kanyongo cluster schools and was opposed to the national trend of 2006, 2008 and 2009 (table 1). Girls were found to have low confidence in themselves at learning mathematics. This could have probably contributed to their lower achievement in examinations when compared to boys. It was also concluded that girls' low achievement in mathematics tended to result from poor teachers' attitudes towards them as well as low parents' expectations of them. Further, teachers tended to interact more with boys and gave them more chances of working out mathematical problems on the chalkboard than girls. This left the female learner with little stimulation and practice and ultimately the girls performed poorly.

Furthermore, household chores tended to leave the day school grade 7 girls with little or no time for homework in mathematics. If they got time for homework they would be tired, hence they would not perform as efficiently as they could have done. Thus, the assignment of chores at home favoured boys as they were left with adequate time for homework after execution of the chores. This influence of lack of time was strengthened by that girls at the boarding school (who had no domestic chores) performed better than those at the day schools as well as some boys who included some at the same boarding school. Parents' supposed beliefs in boys' innate ability at mathematics and subsequent mathematically oriented gadgets provision and encouragement at learning mathematical concepts were mentioned by teachers as having enhanced the boys' results in the subject.

It was also concluded that the grade 7 girls undermined their potential and chances to pass by their failure to believe in themselves, that is, low self-esteem in mathematics negatively affected them. The grade 7 girls indicated that boys were better than themselves at mathematics, even when in some instances schools' results showed otherwise. The girls' preference of male teachers also indicated a lack of confidence in same sex teachers, probably an indication of how they judged themselves mathematically. At grade seven girls and boys should somehow begin to associate with their respective genders as the issue of gender identity, through identifying with same sex models begins to influence them (Larsen and Buss, 2008: 545). Resource availability was also found to influence learners' mathematics results, as shown by that learners (including girls) at a church boarding school (which is better funded from higher school fees paid) were generally passing better than those from rural schools.

However, there was high hope for learners of both genders in mathematics as: 90, 8% (45% girls and 45, 8% boys) were happy with mathematics as a subject, 89, 2% (44, 2% girls and 45% boys) believed that they would do well in mathematics in future, 85, 5% (42, 2% girls and 43, 8% boys) wanted mathematics related jobs and only 10% (7, 5% girls and 2, 5% boys) intended to drop mathematics if given the chance. Such high enthusiasm from both genders could indicate that if given an equally fair chance at learning mathematics they could perform equally well at the subject.

RECOMMENDATIONS

The following recommendations were made based on the research findings:

1. Teachers should give equal chances to boys and girls of working out mathematics problems on the chalkboard to increase teacher-pupil, pupil-pupil and subject-pupil interaction.

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2. Learning and teaching strategies should be varied to cater for the unique learning styles learners possess so that all the learners benefit in the teaching of mathematics.
3. Efforts must be made to build up girls' confidence in themselves and their potentials in females' seemingly difficult areas such as mathematics.
4. Awareness campaigns on mathematics gender disparities and the causes should be made at schools and other gatherings for the benefit of parents and the society at large.
5. More grade seven classes should be allocated to female teachers so as to provide girls with same sex role models.
6. Cause-effect-analysis should always be carried out on mathematics results to pick out gender influenced differences to enable corrective action to be continuously taken.
7. Teachers and parents should be more sensitive to girls' needs in the learning of mathematics.
8. Teachers should redirect learners, especially girls, to understand that gender is not the driving force in successful learning of mathematics.
9. Heads of schools and teachers should try to improve on mathematics learning resources availability in schools, especially in rural schools, where it really lacks.
10. There should be greater co-ordination amongst a school's stakeholders in improving service delivery in the teaching/learning of mathematics.

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