

Influence of School Category on Students' Achievement in Mathematics in Webuye West Sub-County in Kenya

Hesborn Chonge

Department of Educational Psychology, Moi University, Kenya

Abstract: Stakeholders in the education sector in Kenya have been concerned about the poor performance in science subjects and notably mathematics over the years. Students' performance in mathematics and science subjects in examinations administered by the Kenya National Examination Council has remained below expectation. This situation does not favor Kenya in its effort toward developing a scientific and technological culture. More often than not, teachers are blamed for the poor performance and even when the blame is directed to a student, explanation is offered only in terms of the students' cognitive and intellectual ability. Little or no consideration is given to the fact that the category of the school a child goes to can affect ones achievement in Mathematics. As at now, seemingly knowledge of how certain factors like school category relate to student's achievement in mathematics is not well known. Therefore, this study makes an attempt to contribute towards filling the existing gap.

Key words: School Category; Mathematics Achievement

I. INTRODUCTION

Mathematics is well known as a father of all sciences. In the 21st century, mathematics has become the backbone for the prosperity in each and every field of life. Successful achievement in mathematics at secondary stage is prerequisite for better academic achievement in higher stage. Eisenkopf, Hessami, Fischbacher and Ursprung(2015) analyzed the impact of female only classes on mathematics achievement, exploiting random assignment of girls into single set and co-educational classes in Switzerland Secondary Schools. They found out that single sex classes improve the performance of female students in mathematics. Saidin and Brachim (2013) in a study carried out in single sex schools in Malaysia involving 30 secondary students found out that boys performance in English and foreign languages, and girls performance in mathematics and Science improved in a single gender settings. The study found out that in gender separate classroom, students have higher motivation and higher confidence levels which offer them better educational opportunities. Most studies indicate that boys contribute more to classroom interaction for example by "calling out" answers and dominate in "hands – on" activities, such as laboratory work and computed sessions (Francis, 2004). From this perspective, the presence of boys in the classroom is seen as having a negative effect on girls' academic engagement and achievement.

Smyth (2010) asserts that critics of single sex education argue that girls' only schools are unnatural social settings which isolate girls from boys. In well managed co- educational environments boys and girls learn to respect and value each other's ideas. They learn to listen and communicate with each other. Isolating girls and boys in single – sex schools is considered a barrier to them developing the effective interpersonal skills they will need to function as grown – ups in their society. Spielhofer, Benton and Schagen (2004) found that taking attainment at the end of primary schooling into account girls in single sex comprehensives did slightly better than those in co- educational comprehensives, with the difference disappearing among those who scored at level 5 and above in the key stage 2 tests. Elwood and Gipps (1999) observed that the performance of the school in terms of examination results has much less to do with whether it is single - sex or than with other factors. A formal systematic review conducted for the US Department of Education (Mael, Alonso, Gibson, Rogers and Smith, 2005) notes that as in previous reviews the results are equivocal. For many outcomes there is no evidence of either benefit or harm. From the reviewed literature it is evident that previous studies have been inconclusive. Therefore, seemingly there is need for further research on this subject.

II. METHODOLOGY

This study adopted a Causal-comparative research design. According to Fraenkel and Wallen (2017), Causal-comparative research seeks to identify associations among variables by attempting to determine the cause or consequences of differences that already exist between or among groups of individuals. This design was relevant for the study because it specifically investigated the influence of school categories on academic achievement in Mathematics and the design enables the researcher to investigate the influence of independent variables on the dependent variable without manipulating the independent variables. The sample was drawn from form 3 students in selected secondary schools in Webuye west Sub-county from both mixed schools and same sex schools making a sample of 214 participants consisting of boys and girls. The schools were selected using stratified sampling while the participants were selected randomly. Questionnaires were used in data collection.

III. RESULTS

This study endeared at investigating the influence of school categories on students' achievement in Mathematics in secondary schools. To achieve this objective mathematics mean marks for students in mixed and single sex schools was computed. The mean mark for mixed schools was (20.5) and that of the single sex schools was (39.5) as shown in table 1.

Table 1: School category and students achievement in mathematics

School categories	N	X marks	S.D
Mixed	146	20.5	0.188
Single	68	39.5	0.145
Total	214		

Table 2: T-test on difference in achievement of mathematics of students in Mixed schools and those in single sex schools

Paired Samples Test									
		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1		.152	1.044	.070	.014	.289	2.177	213	.031

Table 3 presents results of paired samples t-test. The Sig (2-Tailed) value is 0.031 which is less than 0.05 hence study concluded that there was statistically significant differences between mathematics mean score of students in single sex and mixed schools since paired samples statistics results revealed that the mathematics mean score for students in single sex school was different from that of mixed school by (19). The results in this study collaborate with those by Eisenkopf, Hessami, Fischbacher and Ursprung(2015) and Saidin & Brahim(2013), who found that students in single-sex schools performed better than those in co-educational schools in various subjects. However, a study by Elwood and Gipps(1999) together with one by Mael, Alonso, Gibson, Rogers and Smith(2005) seem to contradict with this findings as they concluded that there is no evidence of academic benefit or harm for students either in single-sex or co-educational schools.

IV. CONCLUSION

The results of analysis to determine the mean mathematics marks for students in mixed and single sex schools yielded (20.5) and (39.5) respectively. The Sig (2-Tailed) value is 0.031 which is less than 0.05 hence study concluded that there was statistically significant differences between mathematics mean score of students in single sex and mixed schools. It was concluded that there is significant differences in the levels of mathematics achievement for students in mixed and same sex schools. This finding suggests that the type of school influences and shapes the performance of students in mathematics. The school is one of the many factors which determine the students' performance in mathematics besides

Table 1 presents results of paired samples statistics and it indicates that the mathematics mean score for students in single sex schools was 39.5 with the standard deviation of 0.145. The mathematics means score for students in mixed schools was 20.5 with the standard deviation of 0.188. The number of participants in single sex schools (N) was 68 and those from mixed schools was 146.

Basing on the results in table 1, a t-test was carried out to determine if there is a significant difference in academic achievement of Mathematics between the students in mixed schools and those in single sex schools. The results are as shown in table 2.

students' mathematics self-concept and self- efficacy which provide the inspiration that generates the desire to perform tasks in mathematics. Schools provide varied learning environments which either support good performance in mathematics or discourage such performance. On the basis of social learning theory, supportive school environment provides students with inspiration for high achievement in mathematics and generally in academic pursuit. A supportive school environment therefore means it contributes positively to the students' mathematics and academic self- concepts.

V. RECOMMENDATIONS

Schools should provide adequate learning support materials for mathematics such as text books, enough trained teachers in mathematics. Further, implementation of the curriculum should be adequately supervised and a culture of achieving high performance in mathematics should be enhanced in order to influence students' achievement in mathematics.

REFERENCES

- [1]. Eisenkopf, G., Hessami, Z., Fischbacher, U., & Ursprung, H. W. (2015). Academic performance and single-sex schooling: Evidence from a natural experiment in Switzerland. *Journal of Economic Behavior & Organization*, 115:123–143.
- [2]. Elwood, J. & Gipps, C. (1999). *Review of Recent Research on the Achievement of Girls in Single-Sex Schools*. London: Institute of Education.
- [3]. Francis, B. (2004). Classroom interaction and access: Whose space is it? In H. Claire (Ed) *Gender in education: A fresh approach (3-19)*. London: Association of Teachers and Lecturers.
- [4]. Fraenkel, J. R. & Wallen, N. E. (2017). *How to Design and Evaluate Research in Education*. New York: McGraw-Hill Global Education Holdings, LLC.

- [5]. Mael,F., Alonso,A., Gibson,D., Rogers, K., & Smith, M. (2005). *Single-Sex Versus Co-educational Schooling: A Systematic Review*. Available at <http://www.ed.gov/about/offices/list/oepd/reports.html>.
- [6]. Saidin, N. and Brahim, M.F. (2013). No girls for me mummy: Providing a positive language learning environment for boys in single gender classes. *Procedia-Social and behavioural Sciences*, 38 (2012).
- [7]. Smyth,E. (2010). "Single-sex Education: What does Researchtellus?"*RevueFrançaisedepédagogie*,vol.171,pp.47-55
- [8]. Spielhofer,T., Benton, T. and Schagen,S.(2004).A study of the effects of school size and single-sex education in English schools. *Research Papers in Education*, 19,133-159.