THE IMPACT OF SCHOOL-GENDER ON STUDENTS' LEARNING OUTCOME: A SECONDARY SCHOOLING SETTING

Lydia I. Eleje

Evaluation, Research and Statistics Unit, Department of Educational Foundations, Faculty of Education, Nnamdi Azikiwe University, Awka Anambra State, Nigeria

li.eleje@unizik.edu.ng, ijeomaexcite@gmail.com

Orcid A/c: http://orcid.org/0000-0002-8587-289X

Chidiebere C. Abanobi

Department of Educational Psychology, Federal College of Education (T), Asaba, Nigeria

abanobichidiebere@gmail.com

Orcid A/c: https://orcid.org/0000.0003-4108-2308

Adeline N. Anyanwu

Curriculum Unit, Department of Educational Foundations, Nnamdi Azikiwe University, Awka, Nigeria

an.anyanwu@unizik.edu.ng

Florence N. Ufearo

Educational Psychology Unit, Department of Educational Foundations, Nnamdi Azikiwe University, Awka, Nigeria

fn.ufearo@unizik.edu.ng

Gbenga Akinfe

Evaluation, Research and Statistics Unit, Department of Educational Foundations, Faculty of Education, Nnamdi Azikiwe University, Awka Anambra State, Nigeria

akinfe.gbenga@yahoo.com

And

Ugochi C. Mbachu

Department of Educational Management and Policy, Nnamdi Azikiwe University, Awka, Nigeria

ugochiunaeze@gmail.com

Lydia Ijeoma Eleje (Corresponding author)

Department of Educational Foundations, Faculty of Education, Nnamdi Azikiwe University, Awka, PMB 5025, Awka, Nigeria

Tel: +2348032756383   E-mail: ijeomaexcite@gmail.com

ABSTRACT

The researchers examined the impact of school-gender on students' learning outcome using ex post facto research design. 100 Senior Secondary 3 (SS3) students that offer economics from 3 randomly selected public secondary schools (each school represents a school-gender) in the urban setting of

Nnewi education zone constituted the study sample. The instrument for data collection was Test of Achievement in Quantitative Economics (TAQE). Mean and an independent t-test (at 5% level of significance) were used to answer the formulated research questions. The findings from the study indicated a non-significant difference (p-values = 0.556; 0.489; 0.216) in the students' mean achievement scores in quantitative-economics based on secondary school-gender. We conclude that school-gender has no influence on students' academic achievement. It is therefore recommended that researchers should conduct similar studies in other zones of Nigeria or yonder to aid generalization of results.

KEYWORDS: school-gender; learning outcome; secondary school; quantitative-economics

1. INTRODUCTION

The educational system of Nigeria as in other countries allows for single-gender and mixed-gender type of schooling in the secondary school level of education. This is reasonable as it encourages more diversity of choice of school for parents, guidance and students. The single-gender (boys or girls only) and mixed-gender (coeducational) types of schooling also raise serious problem for both parents and guardians to select which school-gender is best for their wards to attend. Secondary school is the education level that comes after primary education and before tertiary education. The great interest of the secondary school education system is to graduate students who through teaching and learning have optimally acquired the behaviours expected of them to accomplish at the completion of the programme. Irrespective of the school-gender, the focus of the secondary school administrators is on how to improve their students' academic achievement especially as it prepares them for the next level of education - tertiary education. However, school-gender has been linked with students' academic achievement (Booth, Cardona-Sosa & Nolen, 2018; Eisenkopf, Hessami, Fischbacher, & Ursprung, 2015; Jackson, 2012; Link, 2012).

For instance, in 1999 the findings of Woodward, Fergusson and Horwood recorded a persistent tendency for students in single-gender schools - both boys and girls - to have greater success in the School Certificate Examinations than those attending coeducational schools. Also, O'Neill and Guerin (2010) in their study titled impact of gender-separate education on student achievement favoured single-gender schooling to have better achievement in a test, with boy's school gaining the most despite having similar curriculums taught in all the schools. Smilarly, researchers like Park, Berhman and Choi (2012), and Pahlke, Hyde and Allison (2014) found that single-gender schooling was connected to higher educational attainment. Their research findings supports that student in boys' or girls' only schools had advantageous achievement over those in coeducational schools. In like manner, Booth, Cardona-Sosa and Nolen (2018) who studied the effect single-gender classes in a co-educational university had on students' learning outcome found evidence that single-gender classes lead to students adopting activities linked with improved educational results. In their findings, Booth, et.al, observed that in a week of attending single-sex classes the students' marks improved and they were 7.7% more probably to clear their first year course. In their first year, the female students allocated to single-sex

classes were approximately 57% less possible to fall-out of campus and were 61% more possible to acquire a degree of high rank.

However, inconclusive results on the association between single-gender schools and students' performance were documented by Hyndman in 2007 and US Department of Education in 2005. Hyndman found inconclusive proof of the potential benefit or detriment of single-sex classes/schooling to student achievement. Likewise, the US Department of Education in 2005 conducted a systematic review of 2,220 studies and found slight indication of the advantage or disadvantage of schooling in a single-gender school over mixed-gender schooling and vice versa.

Generally, the findings on the importance of school-gender on students' academic achievement are diverse. The contradictory nature of these research outcomes proposes a need for further research work. It is especially important in the public schools since they are owned by the government. Moreover, it is worthwhile concentrating on all urban schools with an urban environment that attracts residents/students from various geographical zones and statuses. In this present study, the researchers focused on whether school-gender affects students' academic achievement using public secondary schools in urban settings.

In Nigeria, scientific studies on the association amid school-gender (single-gender versus coeducational) and educational achievement is scarce, the present study is thus vital since it offers basis for such scientific study. It also provides Nigerian outlook on the effect of school-gender on learning outcomes, and it is an addition to the bulk of existing studies/writings on single-sex versus coeducational schooling issue.

1.1 Objectives of the study

The general objective of this study was to examine the impact of school-gender on secondary school students' learning outcome in quantitative-economics. Whereas, the study's exact aims were to;

i. determine the students' mean learning outcome scores in quantitative-economics based on secondary school-gender.
ii. determine the impact of school-gender on secondary school students' learning outcome in quantitative-economics.

1.2 Research questions

In the execution of this research work, two research questions were formulated and answered to guide the study.

1. What is the students' mean learning outcome scores in quantitative-economics based on secondary school-gender?

2. Is there any significant difference in students' learning outcome in quantitative-economics based on secondary school-gender?

2. RESEARCH METHODOLOGY

Ex post facto research design was employed for the study. The design was fitting for this present research since it allows the researchers to determine if school-gender affects learning outcome as it occurred or is occurring without much control over the variable (school-gender). The researchers were not interested in controlling the school-gender each student attends but only to find out the impact of school-gender variables on learning outcome.

A total of one hundred (100) Senior Secondary 3 (SS3) students that offer economics from 3 randomly selected public secondary schools in the Nnewi education zone for the 2018/2019 academic session constituted the study sample. Out of this number, twenty-seven (27) students were from 1 randomly selected boys' school, forty five (45) students were from 1 randomly selected girls' school, while twenty eight (28) students were from 1 randomly selected coeducational school. All the SS3 students that offer economics in the three selected schools were recruited in the study.

The data for the study was collected using an existing instrument titled Test of Achievement in Quantitative Economics (TAQE) constructed and validated by Eleje and Esomonu (2018). The TAQE is made up of 20 multiple choice items from subject content of secondary school quantitative-economics. TAQE was used to measure SS3 students' learning outcome in quantitative-economics that the students had (completed the learning of quantitative-economics content) been exposed to before the administration of the instrument.

To collect the data needed for this study, the TAQE was administered to the SS3 students in the three selected schools by their regular classroom economics teachers. Students' achievement scores in TAQE were collected for data analysis. The data was analyzed using SPSS statistical software to compute the mean outcome scores in quantitative-economics and an independent t-test. Mean and t-test (at 5% level of significance) were used to answer the formulated research questions.

3. RESULTS

The collected data were analyzed based on the formulated research questions and the subsequent results presented.

Research question 1: What is the students' mean learning outcome scores in quantitative-economics based on secondary school-gender?

In Table 1 is presented the students' mean achievement scores in quantitative-economics based on secondary school-gender.

Table 1. Mean and Standard Deviation of Students in quantitative-economics based on secondary school-gender

School-Gender	Mean	N	Std. Deviation
Boys School	5.11	27	1.423
Girls School	4.87	45	1.841
Mixed School	5.43	28	1.913
Total	5.09	100	1.759

In table 1, the mean outcome score in quantitative-economics for the students in mixed-gender school was a little bigger than that of the students in boys' and girls' schools. To ascertain if the mean differences were significant or not, t-test of Independent Sample was therefore conducted.

Research question 2: Is there any significant difference in students' learning outcome in quantitative-economics based on secondary school-gender?

In Tables 2-4 are presented the t-test results for the difference between mean outcome scores in quantitative-economics for the students based on secondary school-gender.

Table 2. The t-test Result for Comparing Boys' and Girls' Schools Students' Mean Outcome Scores in Quantitative-economics

		Levene's Test for Equality of Variances		t-test for Equality of Means						95% Confidence Interval of the Difference	
		F	Sig.	t	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference		Lower	Upper
TAQE Scores	Equal variances assumed	1.31	0.256	0.591	70	0.556	0.244	0.413		-0.58	1.069
	Equal variances not assumed			0.63	65.445	0.531	0.244	0.388		-0.53	1.019

As seen in Table 2, there was no significant difference between boys and girls school students' achievement in quantitative economics since the p value was greater than 0.05 (p = .556). Thus, students in both boys and girls schools had the same academic achievement in quantitative-economics.

Table 3. The t-test Result for Comparing Boys' and Mixed Schools Students' Mean Outcome Scores in Quantitative-economics

		Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference	
		F	Sig.	T	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
TAQE scores	Equal variances assumed	2.176	.146	-.696	53	.489	-.317	.456	-1.232	.597
	Equal variances not assumed			-.700	49.834	.487	-.317	.454	-1.229	.594

A non-significant difference between girls and mixed school students' learning outcome in quantitative-economics was observed in Table 3 since the p value was greater than 0.05 (p = .489). Hence, students in both girls and mixed-gender schools had equal academic achievement in quantitative-economics.

Table 4. The t-test Results for Comparing Girls' and Mixed Schools Students' Mean Outcome Scores in Quantitative-economics

		Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference	
		F	Sig.	T	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
TAQE scores	Equal variances assumed	.123	.727	-1.249	71	.216	-.562	.450	-1.459	.335
	Equal variances not assumed			-1.238	55.728	.221	-.562	.454	-1.471	.348

The Table 4 indicates a non-significant difference amid girls and mixed school students learning outcome in quantitative-economics since the p value was greater than 0.05 (p = .216). Therefore, students in both girls and mixed-gender schools had equal learning outcomes in quantitative-economics.

4. DISCUSSION OF FINDINGS

The findings of this study indicate that school-gender has no significant effect on secondary school learning outcome in quantitative-economics. The results of t-test in tables 2 to 4 revealed that the observed differences in mean outcome scores in quantitative-economics among boys' and girls' schools, boys' and mixed schools, and between girls' and mixed schools were not significant (p-values = 0.556, 0.489 and 0.216). That is, there was a non-significant difference in the students' mean achievement scores in quantitative-economics based on secondary school-gender. Both single-gender schooling and mixed-gender schooling had the same impact on students' learning outcome in quantitative-economics.

This result seems surprising considering that TAQE used in this study as the pretest and posttest assessment requires high numerical/quantitative ability (Eleje, 2019; Eleje & Esomonu, 2018). According to Adeoye (2010) and Dania (2014), male students would achieve better than female students when test items are based on contents that requires high numerical/quantitative ability from the learners and vice versa. As such one expected that students in boys' only school would have had their mean achievement in quantitative economics significantly better than students in girls' only school. The non-significant results obtained in this study may be attributed to the numerical abilities of the students across the schools/groups. Where the students of both genders possess similar numerical ability, their mean difference will be expected to be non-significant.

Nevertheless, the outcome of this study is in harmony with that of Hyndman (2007) and US Department of Education (2005). They found slight benefits or disadvantages of single-gender schooling over mixed-gender schooling and vice versa. But, it is in disparity with the findings of Bigler and Signorella (2011), Booth, Cardona-Sosa and Nolen (2018), O'Neill and Guerin (2010), Pahlke, Hyde and Allison (2014), Park, Berhman and Choi (2012), and Woodward, Fergusson and Horwood (1999). They found single-gender schooling to have a significant impact on students' academic achievement. They established that students in either boys' or girls' only schools had greater achievement over those in coeducational (mixed-gender) schools. Generally, the findings on the impact of single-gender schooling versus mixed-gender schooling on students' learning outcome are mixed.

5. CONCLUSION

Since the difference in the mean outcome scores of students in quantitative-economics based on secondary school-gender were not significant, the researchers based on the findings of this study, concludes that school-gender has no influence on students' academic achievement.

6. RECOMMENDATION
The researchers suggest similar studies to be conducted in other zones of Nigeria or beyond to enable generalization of results.

REFERENCES

Adeoye, F. A. (2010). Impact of systematic assessment of instruction on secondary school students' physics achievement at cognitive level of knowledge. Eurasian Journal of Physics and Chemistry Education, 2(1), 44-52. Retrieved from www.acarindex.com/dosyalar/makale/acarindex-1423880505.pdf

Booth, A.L., Cardona-Sosa, L., & Nolen, P. (2018). Do single-sex classes affect academic achievement? An experiment in a coeducational university. Journal of Public Economics, 168, 109-126. Retrieved from https://doi.org/10.1016/j.jpubeco.2018.08.016

Dania, P.O. (2014). Effect of gender on students' academic achievement in secondary school social studies. Journal of Education and Practice, 5(21), 78-84. Retrieved from http://www.iiste.org

Eleje, L.I. (2019). Choice of economics as a subject: Gender influence on senior secondary students. International Journal of Scientific and Education Research, 3(1): 75-87. Retrieved from http://ijsernet.org/

Eleje, L. I., & Esomonu, N.P.M. (2018). Test of achievement in quantitative economics for secondary schools: Construction and validation using item response theory. Asian Journal of Education and Training, 4(1), 18-28. Retrieved from DOI: 10.20448/journal.522.2018.41.18.28

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 and Organization, 115, 123–143. DOI: 10.1016/j.jebo.2014.08.004

Hyndman, R. (2007). Connecting school culture to boys' learning: An investigation into how school culture affects boys' learning in one New Zealand primary school. Unpublished master's thesis, University of Waikato. Retrieved from https://hdl.handle.net/10289/2322

Jackson, C.K. (2012). Single-sex schools, student achievement, and course selection: evidence from rule-based student assignments in Trinidad and Tobago. Journal of Public Economics, 2012, 96 (1-2), 173–187. DOI: 10.1016/j.jpubeco.2011.09.002

Pahlke, E., Hyde, J. S., & Allison, C. M. (2014). The effects of single-sex compared with coeducational schooling on students' performance and attitudes: A meta-analysis. Psychological Bulletin, 140(4), 1042-1072. Retrieved from https://www.semanticscholar.org/paper/The-effects-of-single-sex-compared-with-schooling-a-Pahlke-Hyde/cde6e26de532355b4f4c6d7d3bc695c5d8d2af15

Park, H., Behrman, J. R., & Choi, J. (2012). Causal Effects of Single-Sex Schools on College Entrance Exams and College Attendance: Random Assignment in Seoul High Schools. Demography, 50(2), 447-469. doi: 10.1007/s13524-012-0157-1

Link, S (2012). Single-sex schooling and student performance: Quasi-experimental evidence from South Korea. Ifo Working Paper, 146, 1-39. Retrieved from https://www.cesifo.org/DocDL/IfoWorkingPaper-146.pdf

O'Neill, H. M., & Guerin, A. (2010). Gender-separate education: The effects on student achievement & self-esteem on economically disadvantaged public middle school students in Philadelphia. Business and Economics Faculty Publications. 3.https://digitalcommons.ursinus.edu/bus_econ_fac/3

U.S. Department of Education, Office of Planning, Evaluation and Policy Development, Policy 32 and Program Studies Service. (2005). Single-Sex versus Secondary Schooling: A Systematic Review. Washington, D.C.

Woodward, L. J, Fergusson, D. M, & Horwood, L. J. (1999). The effects of single-sex and coeducational secondary schooling on children's academic achievement. Australian Journal of Education, 43, 142-156. https://doi.org/10.1177/000494419904300204