

SINGLE SEX VS. CO-EDUCATIONAL HIGH SCHOOLS: PERFORMANCE OF CARIBBEAN STUDENTS ACROSS SCHOOL TYPES IN MATHEMATICS ON THE CARIBBEAN SECONDARY EDUCATION CERTIFICATE

Joan Spencer-Ernandez* & Lois George

The University of the West Indies, Mona Campus

Abstract: *Gender-based performance on the Caribbean Secondary Education Certificate (CSEC) mathematics examination across single-sex and co-educational secondary schools in Barbados, Jamaica, St. Lucia, St. Vincent and the Grenadines and Trinidad and Tobago was analyzed to determine which group of students is achieving the highest pass rate and the best quality passes in mathematics. Five years (2013-2017) of CSEC data were examined and the findings indicate that girls in single-sex schools in Jamaica, St. Lucia, St. Vincent and the Grenadines and Trinidad and Tobago consistently had a higher pass rate than girls in co-ed schools and boys in both single-sex and co-ed schools. Additionally, they had the highest percentage of distinctions over any other group. Girls in Barbados' co-ed traditional grammar schools, formerly single-sex schools, also achieved both a higher pass rate and a greater number of distinctions. Given the consistency of the findings, we conclude that further studies should be conducted to determine the variables which may be contributing to the success or failure of students in the different school types; such as prior performance, teacher qualification, teaching styles, classroom context and motivation. The existing gap in the pass rate and quality of pass between girls and boys in the different school types must be narrowed and eliminated if national targets for mathematics are to be met.*

Keywords: *school type, mathematics achievement, coeducational schools, single-sex schools, gender-based performance*

* Corresponding Author(joan.spencer@uwimona.edu.jm)

REFERENCES

- Bailey, B., & Charles, S. (2010). Gender differentials in Caribbean education systems. *Commonwealth Education Partnerships*, 70-72.
- Booth, A. L., Cardona, L., & Nolen, P. J. (2013). Do single-sex classes affect exam scores? An experiment in a coeducational university. *Borradores de Economia*, 787, Banco de la Republica de Colombia. Retrieved from <https://ideas.repec.org/p/bdr/borrec/787.html>
- Caribbean Examinations Council. (2008-2018). *CXC Annual Report 2008-2018*. Bridgetown, Barbados: Caribbean Examinations Council.
- Carnevale, A. P., Smith, N., & Melton, M. (2011). *STEM State level analysis*. Washington, DC: Georgetown University Center on Education and the Workforce. Online at <https://files.eric.ed.gov/fulltext/ED525307.pdf>
- Cobbett, M., & Younger, M. (2012). Boys' educational 'underachievement' in the Caribbean: interpreting the 'problem'. *Gender and Education*, 24(6), 611-625. doi:10.1080/09540253.2012.677014
- Cookson, P. W. (2009). Single-sex or coeducational classes. In L. J. Saha & A. G. Dworkin (Eds.), *International handbook of research on teachers and teaching* (Vol. 21, pp. 919-927). Boston, MA: Springer International Handbooks of Education.
- Drayton, K. (1995). *Gender issues in education: A review of the major issues in education and of relevant Caribbean studies*. Castries, St Lucia: Organisation of Eastern Caribbean States.
- 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 Behaviour & Organization*, 115, 123-143. doi:10.1016/j.jebo.2014.08.004
- Evans, H. (1997). *Gender differences in education in Jamaica*. Paper presented at the World Council of Comparative and International Educational Societies, Capetown, South Africa.
- Evans, H., & Johnson, R. (2001). Identity and academic achievement in single sex and coed schools in Jamaica. *Education and Society*, 19(2), 55-67. doi:10.7459/es/19.2.05

Performance of Caribbean Students in Mathematics

- Favara, M. (2012). *The cost of acting "girly": Gender stereotypes and educational choices*. IZA Discussion Paper No 7037. Retrieved from <http://ftp.iza.org/dp7037.pdf>
- Figueroa, M. (2010). Coming to terms with boys at risk in Jamaica and the rest of the Caribbean. *Commonwealth Education Partnerships*, 11, 66-68.
- Finn, J. (1980). Sex differences in educational outcomes: A cross-national study. *Sex Roles*, 6(1), 9-26, doi:10.1007/BF00288358
- Gates, P., & Vistro-Yu, C. P. (2003). Is mathematics for all? In A. Bishop, M. A. K. Clements, C. Keitel-Kreidt, J. Kilpatrick, & F. K.-S. Leung (Eds.), *Second international handbook of mathematics education* (pp. 31-73). Dordrecht, The Netherlands: Springer.
- George, P. (2012). Who succeeds in mathematics? Caribbean perspectives on the mix of schools and mathematics. *Research Papers in Education*, 27(1), 103-121. doi:10.1080/02671521003637138
- Gurian, M. (2010). *Boys and girls learn differently! A guide for teachers and parents: Revised 10th anniversary edition*. San Francisco, CA: John Wiley & Sons.
- Gurian, M., Stevens, K., & Daniels, P. (2009). *Successful single-sex classrooms: A practical guide to teaching boys & girls separately*. San Francisco CA: John Wiley & Sons.
- Hamilton, M. (1985). Performance levels in science and other subjects for Jamaican adolescents attending single-sex and coeducational high schools. *International Science Education*, 69(4), 535-547. doi:10.1002/sce.3730690409
- Harker, R. (2000). Achievement, gender and the single-sex/coed debate. *British Journal of Sociology of Education*, 21(2), 203-218. doi:10.1080/713655349
- Hayes, A. R., Pahlke, E. E., & Bigler, R. S. (2011). The efficacy of single-sex education: Testing for selection and peer quality effects. *Springer Science*, 65(9-19), 693-703. doi:10.1007/s11199-010-9903-2
- Holness, A. (March, 2015). *Prime minister's budget presentation*. Retrieved from Kingston, Jamaica: <https://bit.ly/2VEw6Cc>
- Ivinson, G., & Jackson, C. (2013). Single-sex and co-educational schooling. Retrieved from <http://www.genderandeducation.com/resources/pedagogies/singlesex-coeducation/>.

- Jackson, C. K. (2010). Do students benefit from attending better schools? Evidence from rule-based student assignments in Trinidad and Tobago. *The Economic Journal*, 120, 1399–1429. doi:10.1111/j.1468-0297.2010.02371.x
- 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*, 96(1-2), 173-187. doi:10.1016/j.jpubeco.2011.09.002
- Jackson, C. K. (2016). *The effect of single-sex education on academic outcomes and crime: Fresh evidence from low-performing schools in Trinidad and Tobago*. II, U.S.: National Bureau of Economic Research.
- Kutnick, P., Jules, V., & Layne, A. (1997). *Gender and school achievement in the Caribbean*. London: Department for International Development.
- Leacock, C. J., Thompson, B. P., Burnett, A., & Obidah, J. (2007). *The academic achievement of Barbados public primary and secondary schools 1999 – 2005: A comprehensive report*. Barbados: Education Evaluation Centre, UWI Cave Hill.
- Lee, V., & Lockhead, M. (1990). The effects of single-sex schooling on achievement and attitudes in Nigeria. *Comparative Education Review*, 34(2), 209-219. doi:10.1086/446918
- Malacova, E. (2007). Effect of single-sex education on progress in GCSE. *Oxford Review of Education*, 33(2), 233-259. doi:10.1080/03054980701324610
- Ministry of Education. (2012). *Education reports and results*. Retrieved from Ministry of Education, Jamaica: <https://bit.ly/2JxgVb7>
- Ministry of Education. (2013). *Education reports and results*. Retrieved from Ministry of Education, Jamaica: <https://bit.ly/2Ge41wI>
- Ministry of Education. (2017). *MOE CSEC public school comparative performance 2017*. Retrieved from Ministry of Education, Jamaica: <https://bit.ly/2G747pZ>
- Ministry of Education. (2018). *MOE CSEC public school comparative performance 2018*. Retrieved from Ministry of Education, Jamaica: <https://bit.ly/2G747pZ>
- Minskoff, E., & Allsopp, D. (2003). *Academic success strategies for adolescents with learning disabilities and ADHD*. Baltimore, MD: Brookes Publishing Company.

Performance of Caribbean Students in Mathematics

- Mucherah, W., Dixon, F., Hartley, K., & Hardin, T. (2010). Perceptions of self-concept and actual academic performance in Math and English among high school students in Kenya. *Educational Research*, 1(8), 263-275.
- 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. doi:10.1037/a0035740
- Pahlke, E., Hyde, J. S., & Mertz, J. E. (2013). The effects of single-sex compared with coeducational schooling on mathematics and science achievement: Data from Korea. *Journal of Educational Psychology*, 105(2), 444-452. doi:10.1037/a0031857
- Sadler, P. M., & Tai, R. H. (2007). The two high-school pillars supporting college science. *Science*, 317, 457-458. doi:10.1126/science.1144214
- Salomone, R. C. (2004). Feminist voices in the debate over single-sex schooling: Finding common ground. *Michigan Journal of Gender and Law*, 11(1), 63-95.
- Sax, L. (2005). *Why gender matters: What parents and teachers need to know about the emerging science of sex differences*. NY, New York: Doubleday.
- Smyth, E. (2010). Single-sex education: What does research tell us? *Revue française de pédagogie*, 171, 47-55. doi:10.4000/rfp.1896
- Spender, D., & Sarah, E. (1980). *Learning to lose: Sexism and education*. London: Women's Press.
- Spielhofer, T., Benton, T., & Schagen, S. (2004). A study of the effects of school size and single-sex education in English schools. *Research Papers in Education*, 19(2), 133-159. doi:10.1080/02671520410001695407
- Sullivan, A., Joshi, H., & Leonard, D. (2009). Single-sex schooling and academic attainment at school and through the lifecourse. *American Educational Research Journal*, 47(1), 6-36. doi:10.3102/0002831209350106
- Theirs, N. (2006). Do single-sex classes raise academic achievement? *Educational Leadership*, 63(7), 70.
- Woodward, L., Fergusson, M., & Horwood, J. (1999). Effects of single-sex and coeducational secondary schooling on children's academic achievement. *Australian Journal of Education*, 43, 142-156. doi:10.1177/000494419904300204