Influence of Gender on Students' Evaluation of Their Basic Science Teachers' Instructional Effectiveness in Awka-South, Anambra State

Nwune, E. C., Nwoye, A. N., Oguezue, N. K., Okoye, M. N.
Department of Science Education, Nnamdi Azikiwe University, Awka,
Anambra State, Nigeria

Abstract. The study investigated junior secondary school students' evaluation of their Basic Science teachers' instructional effectiveness. One hypothesis guided the study. The study made use of the survey research design on a sample of 300 J.S.S. 2 students. The instrument titled Teachers Instructional Effectiveness Evaluation Questionnaire (TIEEQ), adapted from the NUC rubric for students' evaluation of teachers in the tertiary institutions, was used for data collection. A reliability coefficient of 0.85 using Cronbach alpha was obtained for the instrument. The T-test at 0.05 level of significance was used for testing the hypothesis. The major findings from the study showed that male and female students shared the same opinion in the evaluation of their Basic Science teachers in the area of lesson organization and teacher-student interaction but differ in their opinions with respect to the teachers' use of instructional materials covered by the study. It was recommended among other things that Basic Science lessons should be made more fascinating since both male and female students were of the opinion that the stimuli, provided by the teachers, prompt positive responses from the students.

Key words: Basic Science, teachers' instructional practices, students' evaluation

Introduction

Science and technology holds the key to the progress and development of any nation (Anaeto et al., 2016) and it plays a fundamental role in wealth creation, improvement of the quality of life and real economic growth and transformation in any society. Science and technology have been central in the progress and development of virtually all the nations of the world. Thus, in emphasizing the role of science and technology in Nigeria, Egbogah (2012) maintained that it is Nigeria's escape route from poverty. Sambo, Kukwi, Eggari and Mahmuda (2014) posited that for a nation not to be eliminated in the global world, her citizens must go through a science programme that is well planned, assessed/evaluated and implemented by the science teachers so as to be well-grounded in science, and competent enough to face the challenges of life in the society.

The current 9-3-4 system of education in the country lays great emphasis on the teaching of science and technology at all levels. Sambo, Kukwi, Eggari and Mahmuda (2014) remarked that the teaching and the learning of Basic Science started off with the adoption of the National Policy on Education. Basic Science was introduced as a core subject at the junior secondary school level to introduce students to the world of science and to prepare them for higher education in science and technology. Basic Science as defined by Omiko (2016) is the study which involves the study of elementary biology, anatomy, earth/solar system, ecology, genetics, chemistry and physics as a single science subject in the junior secondary school. It offers the basic training in scientific skills required for human survival, sustainable development and societal transformation (FRN, 2008). Succinctly put, Basic Science studies involves the bringing together of traditionally separate science subjects so that students grasp a more authentic understanding of science.

The objectives of Basic Science and Technology teaching and learning according to the Nigerian Educational Research and Development Council (NERDC, 2012) should include amongst others:

1. develop interest in science and technology;

2. acquire basic knowledge and skills in science and technology;
3. apply scientific and technological knowledge and skills to contemporary societal needs;
4. take advantage of the numerous career opportunities provided by science and technology;
5. become prepared for further studies in science and technology;
6. avoid drug abuse and related vices, and
7. be safety and security conscious.

Teachers' effectiveness as expected is paramount for the achievement of the above-mentioned objectives of Basic Science teaching and learning. The concept of teachers' effectiveness is difficult to define since there has not been a consensus agreement on what measures a quality teacher (Stronge, Ward & Grant, 2011). Nevertheless, it is possible to measure some teachers' attributes like interaction with students, teaching strategies, motivation, pedagogical content knowledge and classroom management through quantitative and qualitative research approach. These attributes can serve as indicators of teachers' instructional effectiveness and the process of distinguishing teachers on the basis of quality or effectiveness is done through evaluation.

Evaluation according to Danielson (2010) is a process aimed at ensuring quality. Within the context of this study, evaluation can be defined as a meaningful and essential process for teachers' professional development. It is a formal process used for reviewing the performances and the effectiveness of teachers in the classroom (Sawchuk, 2015). Evaluation of teaching can be done by the teachers themselves, and it is called self-evaluation, or by their colleagues, which is called peer evaluation or by their superiors, which is called hierarchical evaluation or better still, it can be done by their subordinates and in this case are the students and this is called students' evaluation.

Students' evaluation of teachers is a common method to evaluate teaching (Clayson, 2009; Mengel, Sauermann & Zölitz, 2019; Stark & Freishtat, 2014) and has been perceived by literature to be a reliable and viable source of data for teacher evaluation and this is because students spend most of their school life behind a desk or participating in activities designed by the teachers. In turn, they can provide a more holistic look at teachers' teaching practices. Many studies (Joshua, 2004: Paulsene, 2002; Socha, 2010; Vevere & Kozlins, 2011) have shown that students' evaluation of a teacher's teaching plays a dominant role in the operational definition of what constitute effective teaching as the students themselves are seen as being in a better position than any significant others to say how they have been affected by any teaching process and that the evaluation is geared towards teachers' professional development.

The rubric for students' evaluation of teachers developed by the Nigerian University Commission (NUC) to be used in Nigerian universities covered the following aspects: good organization and planning, teacher-student interaction, clarity, effective communication, grading, flexibility of approaches towards teaching, rating of supplementary/instructional materials, teachers' supportive attitude, and overall ratings. This study will however concentrate on teachers' lesson organization and planning, teacher-student interaction and the use of instructional materials since according to Cashin (2003) students are in a better position to evaluate their teachers in these aspects. Though students' evaluation of teaching effectiveness is being used as an important source of data for teacher evaluation by many nations of the world, Nigeria is only introducing its usage in her institutions of higher learning, leaving out the foundational education levels of which the secondary school level is part of, thus the need for the present study.

Many factors have been investigated to determine whether they affect students' evaluation of their teachers' instructional effectiveness. These factors are teachers' and students' characteristics. Notable among the students' characteristics investigated by valid

research is students' gender. The study of Punyanunt-Carter and Carter (2015) and Houston (2006) reported that gender biases in students' evaluation of teaching are not significant enough to actually affect the purpose of the evaluation itself but the studies of Boring (2015) and Mengel, Sauermann and Zölitz (2019) reported otherwise. Due to the inconsistencies with the findings on the influence of students' gender on teachers' effectiveness, this study will further investigate whether or not junior secondary school students of Awka South L.G.A differ in terms of gender in the evaluation of their Basic Science teachers' instructional practices. The study sought to determine male and female junior secondary school students' evaluation of their Basic Science teachers' instructional effectiveness in Awka South Local Government Area. The study specifically sought to determine:

1. the difference in the mean evaluation scores of male and female junior secondary school students' evaluation of their Basic Science teacher's lesson organization and planning, teacher-student interaction and the use of instructional materials.

Hypothesis

The null hypothesis was tested at 0.05 level of significance:

H_0: There is no significant difference in the mean evaluation scores of male and female junior secondary school students' evaluation of their Basic Science teacher's lesson organization and planning, teacher-student and the use of instructional materials.

Method

The study adopted the survey research design. This type of design involves a detailed and critical examination of a topic or situation with a view of finding out what is and how it is.

The population of the study comprised of all the 2615 J.S.S. 2 students in the 15 government owned co-educational secondary schools in Awka South LGA of Anambra State. The choice of J.S.S. 2 was based on the fact that the students have been exposed to learning Basic Science at least for 1 year plus. They are expected to have attained certain level of intellectual ability to be able to answer raised questions on teachers' instructional effectiveness. Simple random sampling technique was used in constituting a sample of 300 J.S.S. 2 students.

The instrument titled "Teachers' Instructional Effectiveness Evaluation Questionnaire (TIEEQ)" adapted from the NUC rubric for students' evaluation of teachers was used for collecting data. The TIEEQ was developed with a four-point rating scale of strongly agree (SA), agree (A), disagree (D) and strongly disagree (SD). The instrument was validated and found reliable at a reliability index of 0.85 using Cronbach alpha technique. Copies of the instrument were administered to the respondents with the help of three research assistants. The independent T-test at 0.05 level of significance was used in testing the hypothesis.

Results

The result of the research based on the hypothesis is summarized as thus;

H_0: There is no significant difference in the mean evaluation scores of male and female junior secondary school students' evaluation of their Basic Science teacher's lesson organization and planning, teacher-student interaction and use of instructional materials.

Table 1. The independent T-test comparisons of male and female junior secondary school students on their Basic Science teachers' lesson organization and planning, teacher-student interaction and use of instructional materials

S/N		MEAN MALE	MEAN FEMALE	F-statistics	P-value	
1	Lesson Organization and Planning	32.26	42.70	3.803	0.32	NS
2	Teacher-Student Interaction	32.26	42.70	1.798	0.33	NS
3	Use of Instructional Materials	32.26	42.70	0.953	0.03	S

NS = Not Significant, S = Significant

The results of research hypothesis as presented in table 1 indicates that there is no significant difference in the mean evaluation scores of male and female junior secondary school students in their evaluation of their Basic Science teachers' lesson organization and teacher-student interaction and this finding is in line with the findings of Punyanunt-Carter and Carter (2015) and Houston (2006). This finding goes to show that gender bias has no place or bearing in the way students evaluates their teachers' lessons and how they interact with their teachers. In other words, both male and female students interact with their teachers alike regardless of gender but with respect to the Basic Science teachers' use of instructional materials, male and female junior secondary school students share different opinions and thus do not come to an agreement. This finding corroborates the findings of Boring (2015) and Mengel, Sauermann andZölitz (2019) who posited that students differ in their evaluation of teachers. In other words and according to them, gender bias influences students' evaluation of their teachers' instructional effectiveness.

Conclusion

The study thus concludes that male and female junior secondary school students are of the same opinion in their evaluation of their Basic Science instructional practice in the area of lesson organization and planning and teacher-student interaction but differ in their opinion in the area of the teachers' use of instructional materials.

Recommendations

The following recommendations were made on the findings from the study;

1. Teachers should keep up the good work as the study has shown that their instructional methods impact the students positively.
2. Lessons should be made more fascinating since both male and female students were of the opinion that the stimuli provided by the teachers prompt positive responses from the students.
3. Teachers should use life objects as well as other teaching aids in teaching both the male and female students life-oriented concepts for better and easier comprehension.
4. Secondary school authorities should use students' evaluation of teachers' teaching for the confirmation of appointment and the promotion of teachers since the students are in a better position to tell which teacher is effective in the classroom since they are the direct consumers of the teachers' teaching.

References

Anaeto, F. C., Asiabaka, C. C., Ani, A. O., Nnadi, F. N., Ugwoke, F. O., Asiabaka, I. P., ... & Ihekeronye, N. (2016). The roles of science and technology in national development. *Direct Research Journal of Social Science and Educational Studies*, *3*(3), 38-43.

Boring, A. (2015). Gender biases in student evaluations of teachers. *Journal of Public Economics*, *145*, 27-41.

Cashin, W. E. (2003). Evaluating college and university teaching: Reflections of a practitioner. In *Higher education: Handbook of theory and research* (pp. 531-593). Springer, Dordrecht.

Clayson, D. E. (2009). Student evaluations of teaching: Are they related to what students learn? A meta-analysis and review of the literature. *Journal of marketing education*, *31*(1), 16-30.

Danielson, C. (2010). Evaluations that help teachers learn. *Educational Leadership, 68*(4), 35–39.

Egbogah, E. O. (2012). The role of science and technology in national development: The miracle of Malaysia and the future for Nigeria. *Petroleum Technology Development Journal*, *1*(4), 1-12.

Federal Republic of Nigeria (2008). *National Policy on Education.* Lagos: Federal Government Press.

Huston, T. A. (2006). Race and gender bias in higher education: Could faculty course evaluations impedefurther progress toward parity? *Seattle Journal for Social Justice, 4*(2), 591-611.

Joshua, M. T. (2004, August). Secondary school: An assessment and evaluation. Resource paper presented at the national workshop on developing education: issues of standards and sustainability in secondary schools in Nigeria (Abuja).

Mengel, F., Sauermann, J., & Zölitz, U. (2019). Gender bias in teaching evaluations. *Journal of the European Economic Association*, *17*(2), 535-566.

Nigerian Education Research and Development Council (2012). *9-years basic education curriculum in Basic Science and Technology.* Abuja: Universal Basic Education Commission.

Omiko, A. (2016). An evaluation of classroom experiences of basic science teachers in secondary schools in Ebonyi State of Nigeria. *British Journal of Education, 54(1),* 64-76.

Paulson, M. B. (2002). *Evaluating Teacher Performance, New Directions for Instructional Research* (114). New Orleans: Wiley Periodicals, Inc.

Punyanunt-Carter, N., & Carter, S. L. (2015). Students' gender bias in teaching evaluations. *Higher learning research communications 5*(3), 28-37

Sambo, M. H., Kukwi, I. J., Eggari, S. O., & Mahmuda, A. (2014). Assessment of the implementation of Basic Science Programme in junior secondary school in Nasarawa West Zone. *Journal of Developing Country Studies, 4*(20), 95-100.

Sawchuk, S. (2015). Teacher evaluation: An issue overview. *Education Week*, *35*(3), 1-6.

Socha, A. B. (2010). *Students' assessments of instruction: A validity study*. Western Carolina University.

Stark, P., & Freishtat, R. (2014). An evaluation of course evaluations. ScienceOpen. Center for Teaching and Learning, University of California, Berkley. Retrieved https://www.scienceopen.com/document.

Stronge, J. H., Ward, T. J., & Grant, L. W. (2011). What makes good teachers good? A cross-case analysis of the connection between teacher effectiveness and student achievement. *Journal of teacher Education*, *62*(4), 339-355.

Vevere, N., & Kozlinslis, V. (2011). Students' evaluation of teaching quality. *US-China Educational Review, B5,* 702-708.