# Impact of Co-Teaching and Solo Teaching on Students' Academic Performance in Educational Research and Statistics in Benson Idahosa University

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#### Abstract

The study sought to compare the impact of co-teaching and solo teaching strategies on the academic performance of students in educational research and statistics in Benson Idahosa University, Benin City, Edo State, Nigeria. Three research questions were raised and three hypotheses were formulated to guide the study. The descriptive design was used for this study employing the ex-post facto type of research design and the population of the study comprised all 300 level students in 2020/2021 and 2021/2022 academic sessions in Benson Idahosa University. Because of the fewness of the total number, all the students were used as sample for the study. The instrument used for the study was a questionnaire titled "Impact of coteaching strategy on academic performance in educational research and statistics (ICSAPQ). Section C of the instrument requested for students' academic scores in Educational Research and Statistics (2020/2021 & 2021/2022 sessions) which the researchers obtained from the departmental office to measure their academic performance. The instrument was subjected to experts' validity and obtained a reliability coefficient of 0.85. Descriptive statistics of the mean and standard deviation was used to answer the research questions while the student's independent t-test was used to test the hypotheses and the results of the study revealed that there is a significant difference between the academic performance of students who are cotaught and those who are not, in educational research and statistics in favour of those who passed through co-teaching strategy; Based on the findings therefore, it is recommended that teachers/lecturers should employ co-teaching strategy in enhancing students' academic performance in Benson Idahosa University so to enable them achieve their maximum potential in life

**Keywords:** Co-teaching, solo teaching, academic performance, students, educational research and statistics.

#### Introduction

Research is a process of systematic inquiry that entails collection of data; documentation of critical information; and analysis and interpretation of that data/information,

in accordance with suitable methodologies set by specific professional fields and academic disciplines. It is the systematic investigation into and study of materials and sources in order to establish facts and reach new conclusions. Research is the careful consideration of study regarding a particular concern or problem using scientific methods. The purpose of research is to enhance society by advancing knowledge through the development of scientific theories, concepts and ideas (Ahmad, 2016). While Educational research is the scientific field of study that examines education and learning processes and the human attributes, interactions, organizations, and institutions that shape educational outcomes. Educational research refers to the systematic collection and analysis of data related to the field of education. The purpose of educational research is to develop new knowledge about the teaching-learning situation to improve educational practice. Educational research can address issues like learning, how do students best learn various subjects. Research involves a variety of methods and various aspects of education including student learning, teaching methods, teacher training, and classroom dynamics.

On the other hand, statistics is a branch that deals with every aspect of the data. Statistical knowledge helps to choose the proper method of collecting the data and employ those samples in the correct analysis process in order to effectively produce the results. Statistics is a crucial process which helps to make the decision based on the data. It is an important field because it helps us understand the general trends and patterns in a given data set and can be used for analysing data and drawing conclusions from it. It can also be used for making predictions about future events and behaviours. The knowledge in statistics helps in gathering information about the appropriate quantitative data, it depicts the complex data in graphical form, tabular form and in diagrammatic representation to understand it easily; it provides the exact description and a better understanding and also helps in designing the effective and proper planning of the statistical inquiry in any field. More also, it gives valid inferences with the reliability measures about the population parameters from the sample data and helps to understand the variability pattern through the quantitative observations. One of the greatest reasons for students' knowledge in research and statistics is its necessity for project writing before graduation hence the course becomes compulsory for every undergraduate in the department of education in the universities.

However, as important as this course, it has been observed that there is a high level of poor performance in the course by the students and this is against the goal of the institution. While trying to ameliorate this issue, some lecturers in the faculty of Arts and Education have taken up some researches. While some looked at the teachers' factors others investigated from the students' end but still, the problem still persists. It could be that these students did not understand the concepts taught in the course and since the knowledge of educational research and statistics is necessary for the reasons stated above and more importantly, project writing, which is one of the criteria for graduation, then, there is a dare need to look for solution and one way to this solution is the application of co-teaching strategy on the teaching of the course.

Co-Teaching is defined as two teachers working together with groups of students; sharing the planning, organization, delivery, and assessment of instruction, as well as the physical space (Washut & Bacharach (2010). In the same way, Friend & Cook (2016) see coteaching as a strategy that involves two or more certified professionals who contract to share instructional responsibility for a single group of students primarily in a single classroom or workspace for specific content or objectives with mutual ownership, pooled resources and joint accountability. However Washut & Bacharach (2010) have adapted the strategies for practicing teachers to use while mentoring pre-service teachers during student teaching. Co-teaching has been called different terms, some being collaboration, parallel teaching, alternative teaching and team teaching (Bouck, 2007). In co-teaching technique, the pair is encouraged to co-plan and quickly incorporate the co-teaching strategies in their practice, providing more opportunities for the students to engage with both adults in the classroom. According to Bacharach & Heck, (2011), Co-Teaching is an attitude of sharing the classroom and students. Co-Teachers must always be thinking: "We are both teaching!"

The co-teaching pair collaborates throughout the experience as this could facilitate students' interest in meeting two different teachers handling a course according to their area of specialization in contrast to the traditional solo teaching method where a single teacher teaches a course or subject. Some students require classrooms that include multiple teachers in a cotaught classroom while some do not. Students in a co-taught environment benefit from having multiple adults in the classrooms that are able to instruct, support, differentiate, and build relationships against those in the solo teaching classroom. Co-teaching, according to Dugan and Letterman (2008), benefit students in being "exposed to the strengths of varied viewpoints". They continued to write "students can develop critical thinking skills by synthesizing multiple perspectives" in the co-taught classroom. According to Witcher and Feng (2010) Co-teaching allows for several models of teaching to take place. In parallel teaching, a type of co-teaching, both teachers are teaching the same information to different groups of students within the classroom. In team teaching, teachers are working together and equally to deliver content to the whole class.

Meanwhile, Parker (2017) used co-teaching strategy to investigate the impact of coteaching on student achievement and behavior at the middle level over the course of two years. Both general education students and students with disabilities were studied to determine if coteaching positively impacted achievement and/or behavior and found that co-teaching has a positive impact on achievement for both populations though not significant; however, coteaching has a statistically significant positive impact on behavior for both general education and special education students. Also, Narmashiri, Candidate and Rad (2021) studied the impact of team teaching on the academic performance, motivation and collaboration of Iranian EFL learners: Oral skills and counselling procedures in focus. A mix-methods design which comprised pretest, posttest, questionnaires, and interview was utilized to collect the necessary

data. 52 Iranian high school EFL students were selected through purposive sampling and divided into a Control Group (CG) and an Experimental Group (EG). Also, two English language teachers, and a teacher as counselor were purposively selected to participate in team teaching procedure. The control group was taught through traditional methods of language teaching and the experimental group was taught through team teaching procedures. The posttest results showed that there were significant differences in favour of the experimental group between the two groups in terms of their oral proficiency. Also, the results obtained from the questionnaires revealed that that there were significant differences in the participants' outlook towards using team teaching methods in the language class.

Furthermore, Uside, Wanja and Mugero (2021) studied to assess the effect of collaborative teaching strategy on secondary school students' achievement in Physics. The Solomon Four group quasi experimental design was used. A sample of 173 form four students in four mixed day secondary schools in Nyeri County participated in the study. The sample was obtained through purposive sampling to obtain a list of mixed day secondary schools that offer the Physics subject at form four. Through random sampling a list of four schools that participated in the study was obtained. The schools were randomly assigned to experimental and control groups. The research instruments consisted of Physics Pre-test (PPT) and Physics Achievement Test (PAT). The Kuder Richardson test was used to determine the reliability of the PPT and PAT. A reliability coefficient of 0.7 and 0.8 was obtained for the PPT and PAT respectively. Descriptive statistics (mean, standard deviation) and inferential statistics (t-test and ANOVA) were used in data analysis. The Statistical Package for Social Sciences (SPSS) version 22.0 was used for statistical analysis. Hypotheses was tested at  $\alpha$ =0.05 level of significance. The study established that Collaborative Teaching Strategy enhanced students' achievement in Physics.

In the same vein, Castro (2007) examined The Effect of Co-teaching on Academic Achievement of K–2 Students with and without Disabilities in Inclusive and Non-inclusive Classrooms. The Overall results of this study support the inclusive co-teaching approach and Co-teaching is just a part of the collaborative efforts needed in schools to increase instructional options, improve educational programs. Khoury (2014) also studied to provide a synthesis of research examining academic outcomes of co-teaching on students who receive special education services. Quantitative information from each research report was coded, an overall effect size was computed, and a moderator analysis was conducted. Results suggest a significant effect (g = .281, k = 32, p < .05) of co-teaching on the academic outcomes of students with disabilities when compared to students with disabilities who did not receive instruction in co-taught settings.

Also, Witcher and Feng (2010) compared the effects of co-teaching vs. solo teaching on students' academic achievement in the elementary school, specifically this research focused the comparative effects on fifth graders' math achievement. A series of unpaired t-tests was

conducted comparing the various math scores of students in the two classes, solo teaching and co-teaching. No statistically significant difference was found, but noticeable differences in 9 out the 10 sets of math scores did seem to favor co-teaching. Results of the study indicate that co-teaching appears to have more positive effect on students' achievement in elementary schools.

One factor that could also have impact on students' academic performance is age. According to John, Jackson and Simiyu (2015), a student's chronological age had a significant impact on his or her academic performance such that the youngest had the potential to outperform the oldest on a teacher-created test. Also, in the study of Abubakar and Adegboyega (2012), age was found to be the greater predictor of academic achievement.

Another factor that could possibly impact on students' academic performance is gender. According to Adigun, Onihunwa, Irumokhai, Yusuf and Olubunmi (2015), gender is one of such factors also mentioned in literature to have considerable effects on students' academic performances especially in science subjects. Gender is the range of physical, biological, mental and behavioural characteristics pertaining to and differentiating between the feminine and masculine (female and male) population. The importance of examining performance in relation to gender is based primarily on the socio-cultural differences between girls and boys. Some vocations and professions have been regarded as men's (engineering, arts and crafts, agriculture etc.) while others as women's (catering, typing, nursing etc.). In fact, parents assign task like car washing, grass cutting, bulbs fixing, climbing ladders to fix or remove things etc. to the boys. On the other hand, chores like dishes washing, cooking, cleaning and so on are assigned to the girls. In a nutshell, what are regarded as complex and difficult tasks are allocated to boys whereas girls are expected to handle the relatively easy and less demanding tasks. As a result of this way of thinking the larger society has tended to see girls as a weaker sex". Consequently, an average Nigerian girl goes to school with these fixed stereotypes. The results of the study showed that the male students had slightly better performance compared to the female students, though not significant.

If researches have proven co-teaching strategy to be effective in teaching and learning and if one of the fundamental purposes of co-teaching is to reach and teach all students using the different modalities of co-teaching, then, it is imperative to examine its impact on the academic performance of students in educational research and statistics, Benson Idahosa University. This is the thrust of the study. Three research questions are raised and three hypotheses formulated to guide the study. The research questions were answered while the hypotheses were tested at 0.05 alpha level of significance.

1. What is the difference between the academic performance of students who were cotaught and those who were not, in educational research and statistics?

- 2. What is the difference between male and female students academic performance who were co-taught in educational research and statistics?
- 3. What is the difference between the academic performance of students who were cotaught in educational research and statistics based on age?

#### **Null Hypotheses**

- 1. There is no significant difference between the academic performance of students who were co-taught and those who were not, in educational research and statistics
- 2. There is no significant difference between male and female students' academic performance who were co-taught in educational research and statistics
- 3. There is no significant difference between the academic performance of students who were co-taught in educational research and statistics based on age

#### Methodology

The descriptive design was used for this study employing the ex-post facto type of research design. This is because the study sought to investigate and describe the effectiveness of co-teaching strategy on students' academic performance in educational research and statistics. The data needed for the study are already available hence no manipulation of any variable under study. The population of the study comprised all 300 level students in 2020/2021 and 2021/2022 academic sessions in Benson Idahosa University. There were 67 students in this level in 2020/2021 session (when the course was co-taught) while 59 students in 2021/2022 academic session (when the course was taught by one teacher), giving a total of 126 students. Because of the fewness of the total number, all the students were used as sample for the study. The instrument used for the study was a questionnaire titled "Impact of co-teaching strategy on academic performance in educational research and statistics (ICSAPQ). The instrument is divided into three sections: section A requests for respondents' bio-data; section B requests for students' academic scores in Educational Research and Statistics (2020/2021 & 2021/2022 sessions) which the researcher obtained from the departmental office to measure their academic performance. The data collected was analysed using the descriptive statistics of mean, standard deviation to answer the research questions while the hypotheses were tested using the students' independent t-test statistics.

#### **Data Analysis and Results Presentation**

**Research Question 1:** What is the difference between the academic performance of students who are co-taught and those who were not, in educational research and statistics?

**Table 1:** Descriptive statistics showing the difference between the academic performance of students who were co-taught and those who are not, in educational research and statistics

<b>Teaching Style</b>	N	SD	Mean	Mean Difference
Co-teaching	67	6.34	55.03	9.41
Solo-teaching	59	8.21	45.62	7. <del>4</del> 1

Table 1 showed that the students that passed through the co-teaching of educational research and statistics had the mean score of 55.03 with standard deviation of 6.34 while those who were taught by a solo teacher had the mean score of 45.62, standard deviation of 8.21 with a mean difference of 9.41 in favour of those who passed through co-teaching strategy. It can be concluded from the table therefore, that, there is a difference between the academic performance of students who were co-taught and those who were not, in educational research and statistics. This implies that those who passed through co-teaching strategy had the higher mean score in educational research and statistics than the students who were taught by solo teacher.

**Research Question 2:** What is the difference between male and female students' academic performance who were co-taught in educational research and statistics?

**Table 2:** Descriptive statistics showing the difference between male and female students' academic performance who were co-taught in educational research and statistics

Gender	N	SD	Mean	Mean Difference
Male	28	6.52	47.46	3.15
Female	39	5.94	44.30	3.13

Table 2 showed that the male students that passed through the co-teaching of educational research and statistics had the mean score of 47.46 with standard deviation of 6.52 while the female students who were taught by the same teaching technique had the mean score of 44.30, standard deviation of 5.94 with a mean difference of 3.15 in favour of the male students. It can be concluded from the table therefore, that, there is a difference between male and female students' academic performance who were co-taught in educational research and statistics. This implies that the male students had the higher mean score in educational research and statistics than the female students.

**Research Question 3:** What is the difference between the academic performance of students who were co-taught in educational research and statistics based on age?

**Table 3:** Descriptive statistics showing the difference between the academic performance of students who were co-taught in educational research and statistics based on age

Age	N	SD	Mean	Mean Difference
17-18 years	37	6.82	46.37	1.67
20 and above	30	5.65	44.70	1.07

Table 3 showed that students between 17 and 18 years of age that passed through the co-teaching of educational research and statistics had the mean score of 46.37 with standard deviation of 6.82 while those form 19 years and above who were taught by the same teaching technique had the mean score of 44.70, standard deviation of 5.65 with a mean difference of 1.67 in favour of the students between 17-18 years. It can be concluded from the table therefore, that, there is a difference between the academic performance of students who were co-taught in educational research and statistics based on age. This implies that the students between 17-18 years had the higher mean score in educational research and statistics than the older students.

**Null Hypothesis 1:** There is no significant difference between the academic performance of students who were co-taught and those who are not, in educational research and statistics

The summary of the test of this hypothesis is presented in Table 4

**Table 4:** t-test on the difference between the academic performance of students who were cotaught and those who were not, in educational research and statistics

<b>Teaching style</b>	N	Mean	Mean diff.	df	t	Sig.(2-ta	iled)	Decision
Co-teaching	67	55.03	9.41	124	-7.24	0.00	Rei	ect Ho
Solo-teaching	59	45.62	7.41	124	-/ <b>.</b> 2-	0.00 Rej		

Table 4 shows that the difference between the academic performance of students who were co-taught and those who were not, in educational research and statistics is significant at 0.00 (t = -7.24; df=124). Since 0.00 is less than 0.05, the observed difference between the academic performance of students who were co-taught and those who were not, in educational research and statistics is significant. With this, the null hypothesis which says there is no significant difference between the academic performance of students who were co-taught and those who were not, in educational research and statistics is rejected. This showed that there is

a significant difference between the academic performance of students who were co-taught and those who were not, in educational research and statistics in favour of those who passed through co-teaching technique or strategy.

**Null Hypothesis 2** There is no significant difference between male and female students academic performance who were co-taught in educational research and statistics

The summary of the test of this hypothesis is presented in Table 5

**Table 5**: t-test on the difference between male and female students academic performance who were co-taught in educational research and statistics

Gender	N	Mean	Mean diff.	df	t	Sig.(2-tailed)	Decision
Male	28	47.46	3.15	65	2.0	0.04	Reject Ho
Female	39	44.30	3.13	0.5	2.0	3 0.04	

Table 5 shows that the difference between male and female students' academic performance who were co-taught in educational research and statistics is significant at 0.04 (t = -2.05; df=65). Since 0.04 is less than 0.05, the observed difference between male and female students' academic performance who were co-taught in educational research and statistics is significant. With this, the null hypothesis which says there is no significant difference between male and female students' academic performance who were co-taught in educational research and statistics is rejected. This showed that there is a significant difference between male and female students' academic performance who were co-taught in educational research and statistics in favour of the male students.

**Null Hypothesis 3:** There is no significant difference between the academic performance of students who were co-taught in educational research and statistics based on age

The summary of the test of this hypothesis is presented in table 6

**Table 6:** t-test on the difference between the academic performance of students who were cotaught in educational research and statistics based on age

Age	N	Mean	Mean diff.	df	t	Sig.(2-tailed)	Decision
17-18	37	46.37	1.67	65	1.07	0.28	Accept Ho
19 and above	30	44.70	1.07	03	1.07	0.20	recept 110

Table 6 shows that the difference between the academic performance of students who were co-taught in educational research and statistics based on age is not significant at 0.28 (t =

1.07; df=65). Since 0.28 is higher than 0.05, the observed difference between the academic performance of students who were co-taught in educational research and statistics based on age is not significant. With this, the null hypothesis which says there is no significant difference between the academic performance of students who were co-taught in educational research and statistics based on age is accepted. This showed that there is no significant difference between the academic performance of students who were co-taught in educational research and statistics based on age.

#### **Summary of Findings**

Three significant findings are obtained from this study and these include that:

- 1. there is a significant difference between the academic performance of students who were co-taught and those who were not, in educational research and statistics in favour of those who passed through co-teaching strategy.
- 2. there is a significant difference between male and female students' academic performance who were co-taught in educational research and statistics in favour of the male students.
- 3. there is no significant difference between the academic performance of students who were co-taught in educational research and statistics based on age

#### **Discussion of Findings**

# Academic performance of students who are co-taught and those who are not, in educational research and statistics

The first finding showed that there is a significant difference between the academic performance of students who were co-taught and those who were not, in educational research and statistics in favour of those who passed through co-teaching strategy. This finding is in agreement with the finding of Parker (2017) who used co-teaching strategy to investigated the impact of co-teaching on student achievement and behaviour at the middle level over the course of two years and found that co-teaching has a positive impact on achievement for both populations though not significant; however, co-teaching has a statistically significant positive impact on behavior for both general education and special education students. In the same vein, the finding aligned with the finding of Castro (2007) who examined the Effect of Co-teaching on Academic Achievement of K-2 Students with and without Disabilities in Inclusive and Non inclusive Classrooms and found the need for inclusion of co-teaching approach as a part of the collaborative efforts needed in schools to increase instructional options, improve educational programs. The finding also supports the outcome of Khoury (2014) who studied to provide a synthesis of research examining academic outcomes of co-teaching on students who receive special education services and found that a significant effect (g = .281, k = 32, p < .05) of coteaching on the academic outcomes of students with disabilities when compared to students with disabilities who did not receive instruction in co-taught settings.

## Male and female students' academic performance who are co-taught in educational research and statistics

The second finding showed that there is a significant difference between male and female students' academic performance who were co-taught in educational research and statistics in favour of the male students. This may be as a result of the male students' relationship with the lecturers that are co-teaching the course and/or their intensive attention while in the classes. This finding is in contrast with the finding of Adigun, Onihunwa, Irumokhai, Yusuf and Olubunmi (2015) who studied the effect of gender on students' academic performance in computer studies in secondary schools in New Bussa, Borgu Local Government of Niger State and found that that the male students had slightly better performance compared to the female students though not significant.

# Academic performance of students who are co-taught in educational research and statistics based on age

The third finding in the study revealed that there is no significant difference between the academic performance of students who were co-taught in educational research and statistics based on age. This may be due to the fact that students' reasoning levels were almost the same irrespective of their respective age ranges. This finding is in disagreement with the assertion of John, Jackson and Simiyu (2015), who found that a student's chronological age had a significant impact on his or her academic performance such that the youngest had the potential to outperform the oldest on a teacher-created test and also, the study of Abubakar and Adegboyega (2012), who discovered age to be the greater predictor of academic achievement.

#### Conclusion

It can be concluded from the study that co-teaching strategy is effective in enhancing the academic performance in educational research and statistics among students in the department of education, Benson Idahosa University, Benin City, Edo State.

#### Recommendation

Based on the findings therefore, it is recommended that:

- 1. teachers/lecturers should employ co-teaching strategy in enhancing students' academic performance in Benson Idahosa University so to enable them achieve their maximum potential in life.
- 2. teachers/lecturers should encourage gender equality attitude in the classroom as this would facilitate equal value and self-esteem among learners irrespective of their gender
- 3. teachers/lecturers should teach every student in the same way, looking off on their age difference as this study showed that age difference is not significantly impacting on their academic performance.

4. Head teachers or Head of Departments should employ co-teaching to teach courses as it has been proved that or co-teaching is positively contributing to students' academic performance.

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