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Assessing the Impact of Collaborative Teaching Strategies on Data Processing Learning Outcomes Among Postgraduates Students in University of Nigeria, Nsukka

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Abstract

The study assessed the impact of collaborative teaching strategies on data processing learning outcomes among postgraduate students of Faculty of Education, University of Nigeria, Nsukka. The study was guided by two research objectives, two research questions and two null hypotheses. The study adopted a descriptive survey design with a population of 630 (400 PG students and 230 lecturers in the Faculty of Education, University of Nigeria, Nsukka). The sample size of the study was 244 (48 lecturers and 196 PG students). Proportionate stratified sampling technique was adopted in selecting the sample size of the study. A well-structured questionnaire titled: "Impact of Collaborative Teaching Strategies on Data Processing Learning Outcomes Questionnaire". The instrument was validated by three experts in Measurement and Evaluation in Department of Educational Foundations, Rivers State University. The reliability of the instrument was established using Cronbach's Alpha method, reliability co-efficient of 0.83 and 0.81 were obtained for the two clusters of the instrument. Mean was used in answering the research questions, while the t-test statistics was used to test the hypotheses at 0.05 level of significance. The findings of the study revealed that lecturer's collaborative teaching on data processing on postgraduate students' learning outcome have high extent on their effectiveness of co-teaching in teaching data processing, and low extent in employing peer feedback techniques. It was recommended among others that Lecturers should involve students in data processing, help them to develop critical thinking and problem-solving skills

Keywords: Collaboration; Data Processing; Evaluation; Learning outcome; Nigeria

1. Introduction

Education is one of the sectors that has gone through numerous modifications over the years. It is no longer lecturers engaging students or students sitting inaudibly and taking notes. It is more dynamic now than ever before in terms of teaching and learning. For example, for effective teaching and learning, there is integration of academic activities that will captivate the interest of students for expected learning outcome through data processing which is the process of conversion of data and raw information into a desirable usable, and understandable format. The steps include collecting, recording, organizing, structuring, storing retrieving, using and disseminating. This steps generally occur through a data processing device, such as computer. This implies that computer device is more or less students centered of conducting modern learning activities (Ogienko & Kim 2024). The use of data processing in teaching and learning increased teachers and students' efficiency and enhanced teaching effectiveness.

Ogienko and Kim (2024) defined data processing as the extraction of information through organizing, indexing and manipulating data. The methods of data processing here refer to the techniques and algorithms used for extracting information from data, which vary a lot with the information of interest and data types. One definition for data is data are encodings that represent the qualitative or quantitative attributes of a variable or set of variables. The categorical

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type of data can represent qualitative attributes, like the eye color, gender and jobs of a person and the quantitative attributes can be represented by numerical type of data, like the weight, height and salary of a person. Ogienko and Kim (2024) enumerated data processing types such as: group classification, which is a method that uses a classifier to put unclassified data into existing categories. The classifier is trained using categorized data labeled by experts, so it is one type of supervised learning in the machine learning terminology. However, most postgraduate students encounter challenges such as skills via data processing in their professional careers which are essential not only for successful professional but also personal lives. (You, 2016). Data processing incorporate face to face teaching and learning, thus integrate direct instruction, individualized assisted learning and collaborative teaching.

Collaborative teaching is also an assimilation of academic activities that will fascinate the concentration of students for anticipated learning outcome. Collaborative teaching, at times called team teaching, has been about for quite a while in one guise or another. It first gained popularity in the 1950s, then evolved during the 1960s before becoming widespread in the early 1970s, particularly in open-plan primary schools, before enjoying something of a resurgence in the 1980s. (Friend & Cook 2010). Now as we move into modern open learning spaces teachers are once again examining how teaching collaboratively can influence on student learning outcomes, collaborative teaching is an effective means of achieving deep learning of concept using different methods such as co-teaching, peer feedback, shared responsibility, ongoing communication, students centered approach and many more. These methods allow lecturers to observe numerous tasks about students' knowledge and their ability to comprehend easily in a giving task.

Esomonu, Akudolu and Ezenwosu (2015), explained that collaborative teaching is when two or more teachers do what teachers do for a class, to plan, teach, assess and take responsibilities for all the students in the class, taking an equal share of responsibilities, leadership and accountability. They further stated that collaborative teaching encompasses sharing responsibilities for educating students in a classroom, it involves the distribution of responsibilities among teachers for planning, instruction and evaluation for a classroom of students. Collaborative learning helps students become more active. The talking that students do in groups pushes them to understand better so as to be able to put their understanding into words. In large classes, it is difficult for teachers to provide much feedback to individual students. In contrast, with collaborative learning, group mates are right there to supply feedback. In large classes, students may easily feel lost and anonymous. However, with collaborative teaching, each person is part of a group that cares about whether they are present and how they are doing.

Consequently, a collaborative environment is built around the goal of education teacher understands the measure of his responsibility, not limited only by the scope of the taught subject. The success of training and teaching is to create an atmosphere that allows students to feel free and safe in the learning process. Good environment enhances cooperative learning in large class.

The capability and efficiency of Data Processing have been improving with the advancement of technology. Processing involving intensive human labor has been gradually replaced by machines and computers. Collaborative teaching works together with cooperative learning. Rather than assume that post graduate students already have the skills needed to work together, lecturers should provide explicit instruction and structured practice in these collaborative skills (Elechi, 2010).

Lecturer's collaboration should be viewed as a generalized process where lecturers regularly meet to share, refine and assess the impacts of the strategies and approaches they are currently using in their classrooms, (Ekpo, 2015). Dike and William (2014) claimed that recognition and feedback from the peers as the important motivators for lecturers, the evaluation from the peers is an obvious vehicle as the incentive to direct the lecturers on the path towards professional growth and improvement. Ike (2016) postulated that effective collaboration builds a sense of collective motivation and it breaks the isolation, they further enhanced that collective efficacy revitalize and motivate successful teaching behaviours that will enhance students learning outcome. Similarly, Haghighi & Abdollahi (2014) highlighted that the establishment of collaboration culture need to form by the leader so that the lecturers can work together based on their similar interest and goals, collaborative teaching includes the professionals planning and delivering instruction using six approaches ie: One Teach, One Observe, One Assist, Parallel Teaching, Station Teaching, Alternative Teaching and Team Teaching. They emphasized that lecturers who have consistent opportunities to work with effective colleagues also improve in their teaching effectiveness and they further provided evidence that co-teaching among small groups of teachers seemed to be the most powerful predictor that improve student learning outcome. Locke (2019) attested that working in the team the senior can facilitate juniors to learn, adapt and familiarize with the environment. Peer feedback is well received by the postgraduate students because the students value the diverse expertise and teaching styles they exposed to.

Mbaba (2021) attested that co-teaching and peer feedback give learners the opportunity of experiencing, as they observe, share goals, receive feedback and employ things, carry out some objects. Shared materials, involves interaction, with aims at seeking to understand what the learners have achieved, and joint settings of goals as a component of collaborative teaching provides lecturers benchmark for determining whether they are actually succeeding in teaching the course (DP). With proper collaboration and cohesiveness, there are vital benefits for lecturers willing to adopt collaborative teaching in postgraduate students in the university. Collaborative teaching equally augments the opportunity for intellectual growth lecturers and increases students-lecturers' interaction (Rad, 2021). While collaborative teaching may prove advantageous for many undergraduate students in schools, some may feel frustrated and discontented about having more than one lecturer in data processing delivery. The drive of education is to produce lecturers who have professional competencies. Lecturers need to be copiously acquired with high academic standard, pedagogic and professional skill, but the problem faced is that most lecturers deserted the improvement of essential soft skill via data processing, flexibility skills, and many more as a result, they lack the necessary competencies in areas such as co-teaching, co-planning, peer feedback, shared resources, and common goals and so on. The researchers observed that many institutions in Nigerian education did not welcome collaborative teaching, thus making teaching more problematic for themselves, forgetting the fact that, being in a co-taught classroom is beneficial, students can spend more time with the lecturers and get more individual attention with more than one lecturer. The lecturers help the students to acquire not only the right knowledge but also values, attitudes, skills and habits that are necessary to cope up with world of tomorrow. Here lies the problems to evaluate the lecturer's collaborative teaching on data processing on students' learning outcome in faculty of education, University of Nigeria Nsukka.

1.1. Purpose of the study

The purpose of this study was to assess the impact of collaborative teaching strategies on data processing learning outcomes among postgraduate students of Faculty of Education, University of Nigeria, Nsukka. Specifically, the study sought to:

- Determine the extent to which co-teaching strategy impacts on data processing learning outcomes among postgraduates of University of Nigeria, Nsukka.
- Examine the extent to which peer feedback strategy impacts on data processing learning outcomes among postgraduates of University of Nigeria, Nsukka

1.2. Research questions

The following research questions guided the study:

- To what extent does co-teaching strategy impact on data processing learning outcomes among postgraduate students of Faculty of Education, University of Nigeria, Nsukka?
- To what extent does peer feedback strategy impact on data processing learning outcomes among postgraduate students of Faculty of Education, University of Nigeria, Nsukka?

1.3. Hypotheses

The following null hypotheses were tested at 0.05 level of significance:

- **H_{O1}:** There is no significant difference in the mean responses of lecturers and students on the extent to which co-teaching strategy impact on data processing learning outcomes among postgraduate students of Faculty of Education, University of Nigeria, Nsukka
- **H_{O2}:** There is no significant difference in the mean responses of lecturers and students on the extent to which peer feedback strategy impact on data processing learning outcomes among postgraduate students of Faculty of Education, University of Nigeria, Nsukka.

2. Empirical review

Musa (2021) investigated collaborative teaching method on academic performance of students in faculty of education in Kebbi State University of science and technology, Aliero Nigeria. The study used quasi-experimental research design and 162 UG 11 students from faculty of education were used. Two (2) null hypotheses were tested, independent sample t-test which was used in testing of the null hypotheses postulated by the study. The study revealed that students who were exposed to the use of collaborative teaching approach (experimental group) scored higher and were significantly difference for those who were taught with the single teacher approach (control group), no significant difference was established between the mean scores of UG11 male and female taught using collaborative teaching approach

(experimental group). The study recommended that lecturers in the faculty should adopt collaborative teaching method for their students for optimum performance as the method has proven to be the best.

Quellet and Toffel (2024) carried a work on empirical guidance: Data processing and analysis with Applications in Stata, R, and Python. The paper describes a range of best practices to compile and analyze datasets and includes some examples in Stata R, and Python. It is meant to serve as a reference for those stated in econometrics, and especially seeking to conduct data analyses in Stata, R, or Python. This is meant to supplement tips and guidance for empirical researchers from many other sources, including the book Mostly Harmless Econometrics by Joshua Angrist and John-Steffen Pischke and the online, "tip sheets" Empirical Etiquette by Tim Simcoe, Cheap Advice for presenting Results by David Levine, and empirical insight by Xiang Ao.

Esomonu, Akudolu and Ezenwosu (2015) examined the effect of collaborative teaching approach on the achievement of students in English language comprehension and how the effect varies across the gender. The population of the study consisted of 5.171 senior secondary two (SS 2) students made up of 2,407 males and 2,764 females in Onitsha education zone of Anambra State. A total of 189 students (97 males and 92 females) were randomly selected from (4) public secondary schools constituted the sample. Two of the schools selected were used as experimental group while the other two were used as the control group. Two research questions and three null hypotheses guided the study. The study employed nonrandomized pre-test-posttest control group quasi experimental design. Interact classes were therefore assigned to experimental and control groups. Data were collected with one comprehension passage. Data generated were analyzed using mean and standard deviation to answer the research questions while analysis covariance (ANCOVA) were used to test the null hypotheses. The finding revealed that the students taught English language comprehension with collaborative teaching approach achieved significantly higher than those of the control group who were taught with single teacher teaching approach. It was recommended that collaborative teaching method should be adopted as a more collective method to teaching and learning English language in public secondary schools to enhance academic achievement of students in the subject.

3. Method

The study adopted a descriptive survey design with a population of 630 lecturers and postgraduate students. This includes 400 PG students and 230 lecturers in the Faculty of Education, University of Nigeria, Nsukka. The sample size of the study was 244 respondents. This comprises 48 lecturers and 196 PG students in the faculty under study. The Krejcie and Morgan sample table was used to determine the sample size. The proportionate stratified sampling technique was adopted in selecting the sample size of the study. The proportionate stratified sampling technique was adopted in selecting the sample size of the study. A well-structured questionnaire titled: "Impact of Collaborative Teaching Strategies on Data Processing Learning Outcomes Questionnaire" was developed and used. The items of the questionnaire were structured on a 4-point rating scale of Very High Extent (VHE), High Extent (HE), Low Extent (LE) and Very Low Extent (VLE). The instrument was validated by three experts in Measurement and Evaluation in Department of Educational Foundations, Rivers State University. The experts assessed the instrument in terms of content, aptness of language and appropriateness. The reliability of the instrument was established using Cronbach Alpha method, reliability co-efficient of 0.83 and 0.81 were obtained for the two clusters of the instrument. Mean and standard deviation were used in answering the research questions, while t- test statistics was used to test the hypotheses at 0.05 level of significance.

4. Results

Research Question 1: To what extent does co-teaching impact on data processing learning outcomes among postgraduate students of Faculty of Education, University of Nigeria, Nsukka?

Table 1 Extent to which co-teaching strategy Impact on Data Processing Learning Outcomes among Postgraduate Student**s**

S/N	Items	Responses				
		Lecturers 48		Students 196		
		$\underline{X}$	SD	$\underline{X}$	SD	Remark
1	How would you rate the effectiveness of co-teaching in your data processing	3.08	0.39	3.18	0.39	High Extent
2	How often did the co-teachers work together during class	2.24	0.37	2.09	0.38	Low Extent
3	How would you rate the communication between the co-teachers	2.98	0.38	3.01	0.31	High Extent
4	How confident do you feel in your ability to process data after taking this course	3.05	0.44	2.80	0.29	High Extent
5	How would you rate the clarity of co-teachers instructions	2.73	0.52	2.70	0.21	High Extent
6	How would you rate the co-teachers ability to answer your questions	2.04	0.26	2.00	0.31	Low Extent
7	Corporation is what I like most about the co-teaching	2.68	0.20	2.50	0.21	High Extent
8	To what extent do co-teachers work together during class	2.62	0.54	3.42	0.52	High Extent
9	I find it difficult to assess	2.74	0.59	2.66	0.61	High Extent
10	I can easily assess my teachers in data processing.	2.44	0.23	3.00	0.20	Low Extent
	Grand Mean	2.66		2.74		High Extent

Data in Table 1 indicated the extent to which co-teaching strategy impacts on data processing learning outcomes among postgraduate students of Faculty of Education, University of Nigeria, Nsukka. Data in Table 1 showed that lecturer's collaborative teaching on data processing on postgraduate students' learning outcome have high extent on their effectiveness of co-teaching ($\underline{\times}$ = 3.08 & 3.18 for lecturers and PG students), yet they have low extent in working together during class ($\underline{\times}$ = 2.24 & 2.09 for lecturers and PG students respectively), rate the communication between the co-teachers ($\underline{\times}$ = 2.98 & .3.01), they have high extent on the confident they feel in their ability to process data after taking this course ($\underline{\times}$ = 3.05 and 2.80 for lecturers and PG students), high extent on how on rate of the clarity of co-teachers instruction ($\underline{\times}$ = 2.73 &2.70), rate of co-teachers ability to answer questions ($\underline{\times}$ = 2.04 & 2.00), corporation is what I like most about co-teaching ($\underline{\times}$ = 2.68 & 2.50) co-teachers work together during class ($\underline{\times}$ = 2.62 & 3.42) I find it difficult to assess the course ($\underline{\times}$ = 2.74 & 2.66) and have low extent in easily assess my teachers in data processing ($\underline{\times}$ = 2.44 & 3.00). The high extent of M.Ed and PhD measurement and evaluation students' learning outcome in data processing in, faculty of education. University of Nigeria, Nsukka Nigeria. is confirmed by the grand mean ($\underline{\times}$ = 2.66 and 2.74). This result specifies that co-teaching impact on data processing learning outcomes among postgraduate students of Faculty of Education, University of Nigeria, Nsukka to a high extent. The standard deviation reveals the extent of agreement of the lecturers' collaborative work in data processing on students' learning outcome in the department science education, Faculty of Education, University of Nigeria, Nsukka.

Research Question 2: To what extent does peer feedback strategy impact on data processing learning outcomes among postgraduate students of Faculty of Education, University of Nigeria, Nsukka?

Table 2 Extent to which Peer Feedback Strategy Impact on Data Processing Learning Outcomes among Postgraduate Students

S/N	Items	Responses				
		Lecturers=48		PG Students=196		
		$\underline{X}$	SD	$\underline{X}$	SD	Remark
1	To what extent do you receive peer feedback on your data processing assignments	2.09	0.32	2.18	0.34	Low Extent
2	How did you rate the quality of peer feedback you received	3.24	0.31	2.50	0.33	High Extent
3	To what extent do you use peer feedback to improve your data processing skills	2.88	0.35	3.08	0.36	High Extent
4	How confident do you feel in your ability to process data after receiving peer feedback	2.05	0.48	2.09	0.29	Low Extent
5	How would you rate the effectiveness of peer feedback in improving your understanding of data processing concepts	2.44	0.55	2.45	0.22	Low Extent
6	How would you rate impact of peer feedback on your ability to apply data processing skills to real world problems	2.38	0.25	2.01	0.44	Low Extent
7	To what extent do receiving peer feedback on your data processing assignment helpful	2.76	0.23	2.55	0.26	High Extent
8	To what extent did we overcome the challenges in data processing after peer feedback	1.62	0.45	2.22	0.50	Low Extent
9	Peer feedback mechanism helped me in overcoming the difficulties in data processing	1.99	0.60	2.42	0.63	Low Extent
10	I can easily assess my teachers in data processing with the aid of peer feedback mechanism	2.33	0.72	1.78	0.29	Low Extent
	Grand Mean	2.37		2.32		Low Extent

Data in Table 2 showed the extent to which peer feedback strategy impact on data processing learning outcomes among postgraduate students of Faculty of Education, University of Nigeria, Nsukka. Data in Table 2 displayed that they have low extent on how they received peer feedback on data. ($\underline{\times}$ = 2.09 & 2.18) for lecturers and PG students), yet they have high extent on extent they received quality of peer feedback ($\underline{\times}$ = 3.25 & 2.50) for lecturers and PG students), extent they use peer feedback to improve data processing skills ($\underline{\times}$ = 2.88 & .3.08), they have low extent on confident they feel in their ability to process data after receiving peer feedback, ($\underline{\times}$ = 2.05 and 2.09 for lecturers and PG students) low extent on how they rate the effectiveness of peer feedback in improving their understanding of data processing concepts ($\underline{\times}$ = 2.44 & 2.45), rate of peer feedback on their ability to apply data processing skills to real world problems ($\underline{\times}$ = 2.38 & 2.01), receiving peer feedback on data processing assignment helpful ($\underline{\times}$ = 2.76 & 2.55) extent they overcome challenges in data processing after peer feedback ($\underline{\times}$ = 1.62 & 2.22) Peer feedback mechanism helped me in overcoming the difficulties in data processing ($\underline{\times}$ = 1.99 & 2.42) I can easily assess my teachers in data processing with the aid of peer feedback mechanism ($\underline{\times}$ = 2.33 & 1.78). The high extent to which peer feedback impact on data processing learning outcomes among postgraduate students of Faculty of Education, University of Nigeria, Nsuka is confirmed by the grand mean ($\underline{\times}$ = 2.37 and 2.32).

4.1. Test of hypotheses

Ho_1: There is no significant difference in the mean responses of lecturers and students on the extent to which co-teaching strategy impact on data processing learning outcomes among postgraduate students of Faculty of Education, University of Nigeria, Nsukka.

Table 3 T-Test Analysis of Significant Difference in the Mean Responses of Lecturers and Students on the Extent to Which Co-Teaching Impact on Data Processing Learning Outcomes among Postgraduate Students of Faculty of Education, University of Nigeria, Nsukka

Respondents	N	X	SD	Df	Std error	t- cal	t-cri	Decision
Lecturers	48	2.66	0.39					
				242	0.05	0.36	1.96	Accepted
PG Students	196	2.74	0.34					

Table 3. shows the t-test analysis of differences in the mean responses of lecturers and students on the extent to which co-teaching strategy impacts on data processing learning outcomes among postgraduate students of Faculty of Education, University of Nigeria, Nsukka. The table revealed that the calculated t-cal value of 0.36 is less than the table value (critical; t-value) of 1.96 at 0.05 level of significance. Therefore, since the calculated t-value (0.36) is less than t-critical value (1.96), the null hypothesis was accepted indicating that there is no significant difference in the mean responses of lecturers and students on the extent to which co-teaching impact on data processing learning outcomes among postgraduate students of Faculty of Education, University of Nigeria, Nsukka.

Ho_2: There is no significant difference in the mean responses of lecturers and students on the extent to which peer feedback impact on data processing learning outcomes among postgraduate students of Faculty of Education, University of Nigeria, Nsukka.

Table 4 T-Test Analysis on Significant Difference in the Mean Responses of Lecturers and Students on the Extent to Which Peer Feedback Impact on Data Processing Learning Outcomes among Postgraduate Students of Faculty of Education, University of Nigeria, Nsukka

Respondents	N	X	SD	Df	Std error	T- cal	T-crit	Decision
Lecturers	48	2.37	0.42					
				242	0.05	0.07	1.96	Accepted
PG Students	196	2.32	.36					

Table 4. shows the t-test analysis of differences in the mean responses of lecturers and students on the extent to which peer feedback impact on data processing learning outcomes among postgraduate students of Faculty of Education, University of Nigeria, Nsukka. The table revealed that the calculated t-value of 0.07 is less than the table value (critical; t-value) of 1.96 at 0.05 level of significance. Therefore, since the calculated t-value (0.07) is less than t-critical value (1.96) the null hypothesis was accepting indicating that there is no significant difference in the mean responses of lecturers and students on the extent to which peer feedback impact on data processing learning outcomes among postgraduate students of Faculty of Education, University of Nigeria, Nsukka.

5. Discussion of findings

The finding in research question one showed that co-teaching strategy impacts on data processing learning outcomes among postgraduate students of Faculty of Education, University of Nigeria, Nsukka to a high extent. This high extent is shown in their ability to rate clarity of co-teachers' instruction, ability to answer questions, corporation, and collaborative teaching improved students Also, most of the students are unable to easily assess the course, work together during class and communicate with their lecturers. The result of significant difference in the mean responses of lecturers and students on the extent to which co-teaching impact on data processing learning outcomes among postgraduate students of Faculty of Education, University of Nigeria, Nsukka. This finding is in agreement with Agelides, (2016), that co-teaching helps every learner to utilize available resources and with the sole aim of achieving the goals of school system towards learning. The process aid in ensuring that classroom lessons run smoothly despite disruptive behaviour by students. Co-teaching helps learners in achieving instructional objectives efficiently. The result from this finding further revealed that most of the students find it difficult to work together with their class and communicate with their lecturers during data processing class and they do not asses the course easily. In line with this findings, Ali (2017) Opine that co-teaching create an avenue for students to master the attitude of cooperation which is a valuable asset in the fulfilment and carrying out duties in their everyday life, it create a disciplinary atmosphere in a classroom

for students to learn and move freely and there is a need for maintaining, enforcing and establishing conditions necessary for progressive and effective teaching and learning, it helps in generating the interest of the learner, encourages attentiveness and active participation by the learner in the lessons taught, and this is largely on the appropriately having assess to the course.

The finding of research question two (Table 2) exposed that peer feedback impact on data processing learning outcomes among postgraduate students of Faculty of Education, University of Nigeria, Nsukka to a high extent. The responses showed however that students received peer feedback on data to a low extent, low extent on confident they feel in their ability to process data after receiving peer feedback, low extent on how they rate the effectiveness of peer feedback in improving their understanding of data processing concepts, low extent on their ability to apply data processing skills to real world problems, low extent on how they overcome challenges in data processing after peer feedback, low extent on how Peer feedback mechanism helped in overcoming the difficulties in data processing and how they can easily assess their teachers in data processing with the aid of peer feedback mechanism. When the mean difference in the responses of lecturers and PG students of measurement and evaluation was subjected to t test (Table 4), the mean responses of lecturers and students on the extent to which peer feedback impact on data processing learning outcomes among postgraduate students of Faculty of Education, University of Nigeria, Nsukka. In support of above findings, Yang, Mak and Yuau (2021), opine that there is a need for students to take more responsibility and seek additional peer feedback in order to improve their learning and to support self-regulated learning. The result from this finding further revealed that most of the students have high extent in receiving quality of peer feedback, receiving peer feedback on data processing assignment, the high extent of lecturers in their collaborative teaching improved M.Ed and PhD measurement and evaluating students' learning outcome in data processing in, faculty of education. In line with this findings, Cui, Schunn, and Gai (2022) stated that students who are committed in learning may be more successful than their lecturers in explaining the lesson to their classmates in understandable and accessible way and they may contribute in reducing lecturers' workload. Also, improve the quality of their subsequent learning and think creatively.

6. Conclusion

The study evaluated the impact of lecturers' collaborative teaching in data processing on postgraduate students' learning outcome. A case study of Faculty of Education. University of Nigeria Nsukka. The two objectives of the study include lecturers' collaborative teaching in co-teaching and lecturers' collaborative teaching in peer feedback. The result of the analysis indicated that most lecturers in Faculty of Education, department of science Education University of Nigeria Nsukka who used collaborative teaching strategies on data processing subject saw high extent of effectiveness as they aided the enhancement of students learning outcomes. The result also showed that most lecturers' have low extent on the use of peer feedback, which has hampered the improvement of students learning outcome in data processing.

Recommendations

- Lecturers should provide opportunities for experiential learning, such as internships, fieldwork, or community-based project
- Lecturers should provide regular feedback, offer constructive feedback to students to help them improve their learning outcomes.
- Lecturers should involve students in data processing, help them to develop critical thinking and problem-solving skills
- Government should provide educators with the tools, resources, and training needed to effectively use data.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

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