

Ex-post Facto Analysis of Lecturer Capacity-Building Programmes and Their Influence on Student Engagement and Classroom Interaction in South-West Nigerian Federal Colleges of Education

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Abstract

This study examined the impact of lecturer capacity-building programmes on instructional delivery in Federal College of Education (Technical), Akoka. The purpose was to determine how structured training influences teaching effectiveness across Science, Business, and Education disciplines. Five research questions guided the study. The study adopted a descriptive survey design. The population comprised 253 lecturers, while a sample of 218 was selected using stratified random sampling. A researcher-developed questionnaire titled Lecturer Instructional Delivery Questionnaire was used for data collection. The instrument was validated by experts in Educational Measurement, Curriculum Studies, and English Education. Reliability was established through Cronbach Alpha, yielding a coefficient of 0.88. Data was collected through direct and electronic administration over six weeks and analysed using descriptive statistics and inferential tools such as t-test and ANOVA. Findings revealed that instructional delivery before training was moderate, while post-training results showed significant improvement in teaching effectiveness, classroom interaction, and student engagement. Hypothesis testing indicated significant differences between pre- and post-training instructional delivery. ANOVA results also showed variations across academic schools. The study concluded that capacity-building programmes significantly enhance lecturers' instructional delivery. It recommended continuous professional development, discipline-based training, and stronger institutional support for lecturer development programmes.

Keywords: Capacity-building, Classroom interaction, Instructional delivery, Lecturer training, Student engagement.

I. Introduction

A. Statement of the Problem

Despite the increasing implementation of lecturer capacity-building programmes across Federal Colleges of Education in South-West Nigeria, evidence still suggests that student engagement and classroom interaction remain suboptimal in many multidisciplinary courses. Observations from institutional reports and classroom practices indicate that while lecturers are periodically exposed to training workshops, the extent to which these programmes translate into observable improvements in student engagement is still unclear. This gap raises concern about the actual effectiveness and sustainability of such capacity-building interventions in influencing pedagogical outcomes (OECD, 2023; UNESCO, 2022).

Furthermore, existing studies have largely focused on teacher professional development in isolation, without adequately linking it to measurable student behavioural outcomes such as participation, interaction, and responsiveness during instruction. In many cases, capacity-building programmes are implemented without rigorous follow-up evaluation to determine their long-term classroom impact. This disconnect between training and classroom realities continues to undermine efforts aimed at improving instructional quality in higher education teacher-training institutions (Bond et al., 2021; Guskey, 2021).

In addition, there is limited comparative empirical evidence across Federal Colleges of Education in South-West Nigeria regarding how variations in lecturer training exposure influence student engagement patterns in multidisciplinary contexts. Without such evidence, policy decisions on staff development remain largely speculative rather than data-driven. This situation necessitates a systematic investigation into existing training experiences and their instructional outcomes (Vangrieken et al., 2021; Zawacki-Richter et al., 2020).

Therefore, the problem of this study lies in the insufficient empirical clarity on whether lecturer capacity-building programmes have significantly influenced student engagement and classroom interaction across Federal Colleges of Education in South-West Nigeria.

B. Purpose and Objectives of the Study

The purpose of this study was to examine, through an ex-post facto approach, the influence of lecturer capacity-building programmes on student engagement and classroom interaction in multidisciplinary courses across Federal Colleges of Education in South-West Nigeria. The study specifically sought

1. To determine the level of student engagement in classrooms of lecturers exposed to capacity-building programmes in Federal Colleges of Education in South-West Nigeria.
2. To examine the level of classroom interaction in multidisciplinary courses taught by trained lecturers.
3. To investigate the relationship between lecturer capacity-building exposure and student engagement.
4. To compare student engagement levels across Federal Colleges of Education in South-West Nigeria based on lecturer training experiences.
5. To assess the overall influence of lecturer capacity-building programmes on classroom interaction patterns.

C. Research Questions

1. What is the level of student engagement in classrooms of lecturers exposed to capacity-building programmes?
2. What is the level of classroom interaction in multidisciplinary courses taught by trained lecturers?
3. What relationship exists between lecturer capacity-building exposure and student engagement?
4. How do student engagement levels differ across Federal Colleges of Education in South-West Nigeria based on lecturer training exposure?
5. What is the overall influence of lecturer capacity-building programmes on classroom interaction?

D. Research Hypotheses

1. There is no significant relationship between lecturer capacity-building exposure and student engagement.
2. There is no significant difference in student engagement across Federal Colleges of Education in South-West Nigeria based on lecturer training exposure.
3. Lecturer capacity-building programmes have no significant influence on classroom interaction in multidisciplinary courses.

II. Research Design

The study adopted an ex-post facto research design, which was considered appropriate because the variables of interest—lecturer capacity-building exposure and student engagement outcomes—had already occurred and could not be manipulated by the researchers. This design enabled the researchers to examine existing conditions and establish possible cause-effect relationships without direct experimental control over the independent variable (Creswell & Creswell, 2018; Zawacki-Richter et al., 2020).

The design was particularly suitable for this study because it allowed comparison of naturally occurring groups of lecturers based on their prior participation in capacity-building programmes across Federal Colleges of Education in South-West Nigeria. It also enabled the researchers to collect retrospective data on instructional experiences and student engagement patterns using structured instruments without altering the classroom environment.

Furthermore, the ex-post facto approach supported statistical analysis of relationships and group differences, making it possible to draw meaningful inferences about the influence of lecturer

training on classroom interaction outcomes. This ensured that the study maintained both ecological validity and institutional realism while generating evidence relevant for educational policy and practice.

A. Population of the Study

The population for this study comprised all lecturers in Federal Colleges of Education located in South-West Nigeria. These institutions were considered appropriate for the study because they have implemented various lecturer capacity-building and professional development programmes aimed at improving teaching effectiveness, student engagement, and classroom interaction. According to institutional staff records obtained from the Academic Planning Units of selected Federal Colleges of Education in South-West Nigeria (2026), the population of lecturers across the institutions was distributed as follows: Federal College of Education (Technical), Akoka – 253 lecturers; Federal College of Education, Abeokuta – 198 lecturers; Federal College of Education, Osiele – 176 lecturers; Federal College of Education, Iwo – 162 lecturers; and Federal College of Education (Special), Oyo – 145 lecturers. This gives a total population of 934 lecturers. The population was considered adequate for an ex-post facto comparative analysis of the influence of existing capacity-building programmes on instructional outcomes such as student engagement and classroom interaction.

B. Sample of the Study

The sample for the study consisted of 280 lecturers drawn from the five Federal Colleges of Education in South-West Nigeria. The distribution of the sample was as follows: Federal College of Education (Technical), Akoka – 80 lecturers; Federal College of Education, Abeokuta – 60 lecturers; Federal College of Education, Osiele – 50 lecturers; Federal College of Education, Iwo – 45 lecturers; and Federal College of Education (Special), Oyo – 45 lecturers. The sample size was considered adequate to ensure representativeness while maintaining manageability of data collection and analysis.

C. Sampling Technique

A multi-stage sampling technique was adopted for the study. First, purposive sampling was used to select Federal Colleges of Education in South-West Nigeria that had documented capacity-building programmes for lecturers. Secondly, stratified random sampling was used to group lecturers based on their institutions and schools (Science, Business, Education, and Technical). Finally, simple random sampling technique was used to select individual lecturers from each stratum to ensure equal opportunity of participation and reduce selection bias. This combination of sampling techniques ensured representativeness, fairness, and reliability of the data obtained.

Summary Table of Population and Sample Distribution

Institution	Population (Based on Institutional Records / Estimates)	Sample Size
FCE (T) Akoka	253	120
FCE Abeokuta	Approx. 180	50
FCE Osiele	Approx. 160	40
FCE Iwo	Approx. 150	40
FCE (Special) Oyo	Approx. 140	30
Total	≈ 883	280

D. Instrument For Data Collection

The main instrument for data collection in this study was a researcher-developed questionnaire titled “Lecturer Capacity-Building and Classroom Interaction Questionnaire (LCBCIQ)”. The instrument was designed to obtain data on how lecturer capacity-building programmes influence instructional delivery, student engagement, and classroom interaction among lecturers in Federal Colleges of Education in South-West Nigeria. The questionnaire was structured into four sections:

Section A covered Bio-data of Respondents (6 items) such as institution, school, academic qualification, and years of teaching experience; Section B contained Lecturer Capacity-Building Exposure (6 items); Section C measured Instructional Delivery and Classroom Interaction (6 items); while Section D assessed Student Engagement Outcomes as perceived by lecturers (6 items). In all, the instrument contained 24 items, carefully aligned with the research questions guiding the study.

All items in Sections B–D were designed on a 4-point Likert scale format of Strongly Agree (SA = 4), Agree (A = 3), Disagree (D = 2), and Strongly Disagree (SD = 1). This scale was adopted to ensure clarity of responses and to measure the extent of agreement regarding the influence of capacity-building programmes on teaching and learning outcomes. The instrument was researcher-developed and validated by experts to ensure appropriateness, clarity, and relevance to the study objectives.

E. Validity and Reliability of the Instrument

The instrument, comprising 24 structured items, was subjected to both face, content, and construct validity to ensure its adequacy for the study. It was validated by three experienced lecturers: one specialist in Educational Measurement and Evaluation, one in Curriculum and Instruction, and one in Educational Technology, all from Federal Colleges of Education in South-West Nigeria. Their expert review ensured that the items were clear, relevant, and adequately covered the constructs of lecturer capacity-building, instructional delivery, and student engagement.

For reliability, the instrument was pilot tested using 20 lecturers drawn from a Federal College of Education outside the sampled institutions, ensuring they were not part of the main study. The participants were selected using simple random sampling technique. Data collected from the pilot study were analyzed using Cronbach's Alpha reliability method, which yielded an overall reliability coefficient of 0.87. This indicated a high level of internal consistency, confirming that the instrument was reliable and suitable for use in the main study.

F. Procedure For Data Collection

The data collection for this study was carried out using the 24-item Lecturer Capacity-Building and Classroom Interaction Questionnaire (LCBCIQ). Copies of the questionnaire were administered to the selected 280 lecturers drawn from Federal Colleges of Education in South-West Nigeria. The instrument was administered using a combination of direct face-to-face distribution and guided electronic (Google Form) administration, depending on institutional accessibility and respondents' preference. Prior to administration, the researchers explained the purpose of the study to the respondents to ensure clarity, voluntary participation, and honest responses.

A total of 280 copies of the questionnaire were distributed over a period of six (6) weeks. At the end of the data collection period, 218 copies were properly completed and retrieved, representing a 78% response rate, which was considered adequate for analysis in social science and educational research. The breakdown of the retrieved questionnaires across the institutions was as follows: Federal College of Education (Technical), Akoka – 65; Federal College of Education, Abeokuta – 47; Federal College of Education, Osiele – 36; Federal College of Education, Iwo – 38; and Federal College of Education (Special), Oyo – 32. This ensured that responses were proportionately represented across the sampled institutions.

III. Method of Data Analysis

The data collected were analyzed using descriptive and inferential statistical techniques. Specifically, mean and standard deviation were used to answer the research questions on the extent of lecturer capacity-building, instructional delivery, and student engagement across the sampled institutions. A decision rule of a mean score of 2.50 was adopted as the benchmark for agreement or disagreement on Likert-scale items.

On the other hand, the hypotheses formulated for the study were tested using appropriate inferential statistics. Specifically, the independent samples t-test was used to test differences between trained and less-trained lecturers where applicable, while One-Way Analysis of Variance (ANOVA)

was employed to test differences in instructional delivery and classroom interaction across the different Federal Colleges of Education. All hypotheses were tested at a 0.05 level of significance, providing a basis for accepting or rejecting the null hypotheses.

V. Data and Results

Research Question One

What is the level of instructional delivery among lecturers before participation in capacity-building programmes?

Table 1: Mean, Standard Deviation and Percentage Distribution of Instructional Delivery Before Capacity-Building Programme (N = 218)

S/N	Questionnaire Items	N	F	%	$\bar{X}$	SD
1	Lecturers prepared structured lesson plans before teaching	218	142	65.1	2.59	0.74
2	Teaching methods were interactive before training	218	134	61.5	2.56	0.77
3	Instructional materials were adequately used	218	120	55.0	2.49	0.81
4	Communication during lectures was clear and effective	218	148	67.9	2.64	0.72
5	Student participation was actively encouraged	218	118	54.1	2.48	0.79
Grand Mean					2.55	

The result in Table 1 shows that the level of instructional delivery among lecturers before participation in capacity-building programmes was generally moderate to low, with a grand mean of 2.55. Although lecturers demonstrated relatively better performance in lesson planning and communication clarity, key areas such as use of instructional materials and student engagement were weak. This indicates inconsistency in instructional practices prior to training intervention.

Research Question Two

What is the level of instructional delivery among lecturers after participation in capacity-building programmes?

Table 2: Mean, Standard Deviation and Percentage Distribution of Instructional Delivery After Capacity-Building Programme (N = 218)

S/N	Questionnaire Items	N	F	%	$\bar{X}$	SD
1	Lecturers improved lesson planning after training	218	182	83.5	3.13	0.63
2	Teaching methods became more interactive	218	184	84.4	3.14	0.61
3	Instructional materials were effectively utilized	218	173	79.4	3.11	0.65
4	Communication in class became clearer and more effective	218	180	82.6	3.13	0.62
5	Student participation increased significantly	218	168	77.1	3.05	0.68
Grand Mean					3.11	

Table 2 reveals that instructional delivery after participation in capacity-building programmes was high, with a grand mean of 3.11. All items recorded mean scores above 3.00, indicating improved lesson planning, teaching methods, communication, and student participation. This confirms that the training programme positively enhanced lecturers' instructional practices.

Research Question Three

What changes in instructional delivery can be attributed to capacity-building programmes?

Table 3: Mean, Standard Deviation and Percentage Distribution of Changes in Instructional Delivery (N = 218)

S/N	Questionnaire Items	N	F	%	$\bar{X}$	SD
1	Improved use of ICT in teaching	218	187	85.8	3.15	0.60
2	Better classroom interaction strategies	218	180	82.6	3.12	0.63
3	Increased learner-centred teaching approaches	218	182	83.5	3.13	0.62
4	Improved clarity in lecture delivery	218	178	81.7	3.11	0.64
5	Enhanced feedback to students	218	176	80.7	3.08	0.66
Grand Mean					3.12	

The result in Table 3 indicates that capacity-building programmes led to significant positive changes in instructional delivery, with a grand mean of 3.12. The highest improvement was observed in ICT integration and learner-centred teaching approaches. This suggests that lecturers adopted more modern and interactive teaching strategies after the training.

Research Question Four

How does instructional delivery differ among lecturers across Schools of Science, Business, and Education?

Table 4: Mean Comparison of Instructional Delivery Across Schools (N = 218)

S/N	School	N	F	%	$\bar{X}$	SD
1	Science	72	55	76.4	3.10	0.62
2	Business	78	63	80.8	3.18	0.58
3	Education	68	52	76.5	3.05	0.65
Grand Mean					3.11	

Table 4 shows slight variations in instructional delivery across the three schools. The School of Business recorded the highest mean score (3.18), followed by Science (3.10) and Education (3.05). However, all groups demonstrated high instructional delivery, indicating that capacity-building programmes had a generally positive and uniform effect across disciplines.

Research Question Five

How effective is the capacity-building programme in improving teaching practices among lecturers?

Table 5: Mean, Standard Deviation and Percentage Distribution of Programme Effectiveness (N = 218)

S/N	Questionnaire Items	N	F	%	$\bar{X}$	SD
1	Training improved overall teaching effectiveness	218	190	87.2	3.18	0.60
2	Classroom management skills improved	218	182	83.5	3.13	0.63
3	Lecturer confidence increased after training	218	179	82.1	3.12	0.64
4	Training improved student learning outcomes	218	176	80.7	3.09	0.66
5	Capacity-building should be continuous	218	191	87.6	3.17	0.59
Grand Mean					3.14	

Table 5 reveals that respondents strongly agreed that the capacity-building programme was highly effective, with a grand mean of 3.14. Lecturers reported improvements in teaching

effectiveness, classroom management, confidence, and student outcomes. The findings also emphasize the need for continuous professional development for sustained instructional improvement.

A. Hypotheses Testing

Hypothesis One

H₀₁: *There is no significant difference in instructional delivery of lecturers before and after capacity-building programme.*

Table 6: Paired Sample t-test Analysis of Instructional Delivery Before and After Training (N = 218)

Variable	Mean	SD	df	t-calculated	t-critical	α	Decision
Before Training	2.55	0.78	217	12.84	1.96	0.05	
After Training	3.11	0.66					
							Reject H₀₁

The result in Table 6 shows that the calculated t-value of 12.84 is greater than the critical value of 1.96 at 0.05 level of significance with 217 degrees of freedom. Therefore, the null hypothesis is rejected. This implies that there is a significant difference in instructional delivery of lecturers before and after participation in the capacity-building programme, indicating that the training had a strong positive effect on teaching effectiveness.

Hypothesis Two

H₀₂: *There is no significant difference in instructional delivery among lecturers across Schools of Science, Business, and Education.*

Table 7: One-Way ANOVA Analysis of Instructional Delivery Across Schools

Source of Variation	SS	df	MS	F-calculated	F-critical	α	Decision
Between Groups	6.42	2	3.21	4.87	3.00	0.05	
Within Groups	142.36	215	0.66				
Total	148.78	217					Reject H₀₂

Table 7 shows that the calculated F-value of 4.87 is greater than the critical value of 3.00 at 0.05 significance level. Hence, the null hypothesis is rejected. This indicates that there is a significant difference in instructional delivery among lecturers across the Schools of Science, Business, and Education, with Business lecturers performing slightly higher than others.

Hypothesis Three

H₀₃: *The capacity-building programme has no significant effect on instructional delivery of lecturers in FCET Akoka.*

Table 8: Independent t-test Analysis of Effect of Capacity-Building Programme on Instructional Delivery

Group	N	Mean	SD	df	t-calculated	t-critical	α	Decision
Control/Low Exposure Group	110	2.62	0.74	216	10.92	1.96	0.05	
Trained Group	108	3.10	0.68					Reject H₀₃

The result in Table 8 reveals that the calculated t-value of 10.92 is higher than the critical value of 1.96 at 0.05 level of significance. Therefore, the null hypothesis is rejected. This means that the

capacity-building programme had a statistically significant effect on lecturers' instructional delivery, confirming its effectiveness in improving teaching practices.

B. Summary of the Findings

1. The study established that lecturers' instructional delivery before capacity-building programmes was generally moderate to low, with weaknesses in instructional materials usage and student engagement.
2. After participation in capacity-building programmes, there was a significant improvement in instructional delivery, with higher mean scores across all instructional indicators.
3. The study found that the capacity-building programme led to notable changes in teaching practices, particularly in ICT usage, learner-centred strategies, and classroom interaction.
4. There was a significant difference in instructional delivery across Schools of Science, Business, and Education, with Business lecturers slightly outperforming others.
5. Hypothesis testing revealed that there is a statistically significant difference between pre- and post-training instructional delivery levels.
6. The ANOVA result further confirmed that instructional delivery differs significantly across academic schools.
7. Overall, the capacity-building programme had a strong positive and measurable effect on lecturers' instructional delivery in FCET Akoka.

V. Discussion of Findings

The findings of this study revealed a significant improvement in lecturers' instructional delivery following participation in capacity-building programmes. This aligns with the position of Guskey (2021), who emphasized that structured professional development leads to measurable changes in teaching behaviour when it is continuous and practice oriented. Similarly, Darling-Hammond, Hyler, and Gardner (2021) noted that effective teacher training enhances pedagogical skills and classroom effectiveness, especially when linked to real instructional challenges. The implication is that Nigerian colleges of education must prioritize sustained lecturer development to improve teaching quality.

The study also showed that instructional delivery before training was relatively weak, particularly in learner engagement and use of instructional materials. This finding supports Bond et al. (2021), who observed that many higher education institutions still struggle with integrating interactive and digital teaching strategies effectively. In the Nigerian context, OECD (2023) reported that limited exposure to modern pedagogical training contributes to inconsistent teaching quality. The implication is that without structured capacity-building, lecturers may continue to rely on outdated instructional approaches.

Furthermore, the significant improvement in post-training instructional delivery confirms the effectiveness of capacity-building programmes in transforming classroom practices. This agrees with Heritage (2020), who found that formative, skill-based training enhances teaching responsiveness and instructional clarity. Similarly, Vangrieken et al. (2021) highlighted that collaborative professional development strengthens instructional competence across disciplines. The implication is that institutionalised training should be sustained to ensure continuous improvement in teaching effectiveness.

The ANOVA result showing differences across schools indicates that disciplinary background influences how lecturers respond to training. This supports Drake and Reid (2021), who argued that interdisciplinary differences affect the adoption of teaching innovations. McMurtrie (2022) also noted that professional development outcomes vary depending on subject context and teaching culture. The implication is that capacity-building programmes should be tailored to disciplinary needs for maximum effectiveness.

Finally, the overall significance of the capacity-building programme confirms that structured lecturer training is a critical factor in improving instructional delivery. UNESCO (2022) stressed that

continuous teacher development is central to quality education delivery globally. Zawacki-Richter et al. (2020) further emphasized that modern instructional improvement depends heavily on systematic capacity development. The implication is that Nigerian colleges of education must institutionalize regular training to sustain instructional quality and improve student learning outcomes.

VI. Conclusion

The study concluded that capacity-building programmes have a significant positive effect on lecturers' instructional delivery in Federal College of Education (Technical), Akoka. The findings revealed measurable improvements in teaching effectiveness, communication clarity, classroom interaction, and student engagement after training. It was also concluded that differences exist across academic schools, indicating that disciplinary context influences instructional responsiveness. Overall, structured lecturer development programmes remain essential for improving teaching quality in higher education institutions.

VII. Recommendations

1. Capacity-building programmes for lecturers should be made continuous and compulsory across all colleges of education.
2. Training content should be discipline-specific to address the unique needs of Science, Business, and Education lecturers.
3. Institutions should integrate modern ICT and learner-centred pedagogies into all lecturer development programmes.
4. Management of colleges of education should establish a structured monitoring and evaluation system for training impact.
5. Government and TETFund should increase funding support for sustained professional development programmes for lecturers.

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