

# DETERMINANTS OF DISTANCE LEARNERS' ENGAGEMENT AT AHMADU BELLO UNIVERSITY, NIGERIA: POLICY DIRECTIONS

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## **Abstract**

*This study examined the relationship among active learning strategies, support services, and distance learners' engagement at the Distance Learning Centre of Ahmadu Bello University, Nigeria. Four research objectives and four null hypotheses guided the study. The correlational survey research design was adopted. The population comprised 12,500 undergraduate distance learners, from which a sample of 412 respondents was selected using stratified and simple random sampling techniques. Data were collected using a self-developed instrument titled Active Learning, Support Services, and Engagement Questionnaire (ALSEQ), with established validity and reliability. Data were analysed using chi-square statistics at the 0.05 level of significance. The findings revealed that collaborative learning, interactive media tools, academic support, and technical support significantly related to distance learners' engagement. This indicates that both pedagogical strategies and institutional support systems play a critical role in enhancing learner participation in distance education. The study concludes that effective implementation of active learning strategies, alongside robust academic and technical support services, significantly improves engagement among distance learners. The study recommends that the Directorate of Distance Learning should institutionalise structured collaborative learning activities and integrate interactive media tools into course design to optimise learners' engagement.*

**Keywords:** active learning strategies; academic support; collaborative learning; distance learners' engagement; support services

## **Introduction**

In Nigeria, the National Universities Commission has prioritised Open and Distance Learning (ODL) as a strategic response to the growing demand for university education, resulting in increased enrolment across institutions. According to Wang and Chen (2024), ODL facilitates learning without physical presence and serves as a viable approach to expanding access, promoting lifelong learning, and overcoming geographical and time constraints. Despite these advantages, a critical concern remains: whether the active learning strategies employed by

instructors and the support services provided by institutions effectively enhance distance learners' engagement across behavioural, emotional, and cognitive dimensions.

Learner engagement, widely conceptualised as a multidimensional construct encompassing behavioural, emotional, and cognitive involvement, is a key determinant of success in distance education (Hewitt, 2022; Suleiman & Musa, 2024). It reflects the degree of psychological investment and effort learners devote to academic activities (Fredricks et al., 2004, as cited in Yakubu, 2022). However, low

engagement—often evidenced by high attrition rates, passive participation, and limited interaction with course materials—continues to undermine the effectiveness of distance learning programmes (Ojo & Bello, 2020).

To address these challenges, educational institutions increasingly emphasise the integration of active learning strategies and the provision of robust support services (Okonkwo et al., 2023). Active learning strategies involve instructional approaches that require learners to actively participate in meaningful tasks and reflect on their learning processes (Bonwell & Eison, as cited in Ibrahim, 2019). These include collaborative learning, problem-based learning, and interactive digital activities adapted for online environments (Adeleke, 2018). Such strategies are particularly important in distance education, as they reduce learner isolation and promote deeper cognitive engagement (Usman, 2024).

Collaborative learning, for instance, enables learners to work collectively toward shared goals, thereby enhancing both social interaction and cognitive processing (Adebayo & Olawale, 2023). Similarly, the use of interactive media tools—such as simulations and virtual laboratories—promotes active participation by requiring learners to manipulate content and receive immediate feedback (Chukwu & Mbah, 2024). Reflective activities, including self-assessment and journaling, further support metacognitive development and sustained engagement (Akpan, 2021).

In addition to instructional strategies, support services play a crucial role in facilitating engagement. These services include academic support, administrative assistance, and counselling, all of which help reduce barriers to learning (Sani & Aliyu, 2021; Nwosu & Chinedu, 2023). When effectively implemented, they

enhance learners' confidence, reduce isolation, and improve persistence (Musa & Tanko, 2022). Despite these advancements, the effectiveness of distance learning programmes depends on the interaction between pedagogical strategies and institutional support systems (Federal Ministry of Education, 2020). Therefore, this study examines the influence of active learning strategies and support services on distance learners' engagement at the Distance Learning Centre, Ahmadu Bello University, Zaria.

### Statement of the Problem

The perceived low learner engagement remains a persistent challenge in distance education globally and within the Distance Learning Centre of Ahmadu Bello University, Zaria. This challenge is reflected in high withdrawal rates, delayed programme completion, and reduced learner participation (Ojo & Bello, 2020). Such outcomes undermine both the effectiveness of distance education programmes and their capacity to meet national educational objectives.

Although prior studies have identified factors such as transactional distance, limited feedback, and self-regulation difficulties as contributors to disengagement, there is limited empirical evidence on how specific active learning strategies and support services influence engagement within the Nigerian context, particularly in Northern Nigeria (Suleiman & Musa, 2024).

Existing interventions have largely focused on technological infrastructure, such as device provision and internet access through initiatives like the Tertiary Education Trust Fund. While these efforts improve access, they often neglect pedagogical practices and learner support mechanisms that are critical for sustained engagement.

Consequently, a gap exists in understanding how instructional strategies and

institutional support interact to influence learner engagement in distance education settings. This study addresses this gap by examining the combined influence of active learning strategies and support services on distance learners' engagement, with the aim of providing context-specific recommendations for improving practice at Ahmadu Bello University, Zaria.

### **Purpose of the Study**

The goal of this study is to investigate the relationship among active learning strategies (collaborative learning and interactive media tools), support services (academic support and technical support) and Distance Learners' Engagement at Ahmadu Bello University (ABU), Zaria, Nigeria. Specifically, the study seeks to:

- i. determine the relationship between collaborative learning and distance learners' engagement.
- ii. examine the relationship between interactive media tools and distance learners' engagement.
- iii. investigate the relationship between academic support service and distance learners' engagement.
- iv. determine the relationship between technical support service and distance learners' engagement.

### **Research Hypotheses**

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

**H0<sub>1</sub>:** Collaborative learning has no significant relationship with distance learners' engagement.

**H0<sub>2</sub>:** There is no significant relationship between interactive media tools and distance learners' engagement.

**H0<sub>3</sub>:** Academic support services have no significant influence on distance learners' engagement.

**H0<sub>4</sub>:** There is no significant relationship between technical support service and distance learners' engagement.

### **Collaborative Learning and Students' Engagement**

Collaborative learning has been widely identified as a critical factor in enhancing students' engagement in online learning environments. Martin and Bolliger (2018) investigated the effectiveness of various engagement strategies and found that peer-to-peer interactions were rated highest for fostering a sense of community and social engagement among students. This sense of connectedness is particularly important in distance learning contexts where physical separation can limit interaction.

In the Nigerian context, Yusuf (2021) highlights the challenge of transactional distance, defined as the psychological gap between learners and instructors in remote environments. The study found that participation in structured collaborative activities, such as peer-moderated online groups and shared problem-solving tasks, significantly improved students' emotional engagement.

Taken together, these findings suggest that collaborative learning plays a vital role in reducing isolation and enhancing engagement by promoting interaction and shared learning experiences. This is particularly relevant for distance learners at Ahmadu Bello University where opportunities for physical interaction are limited.

### **Interactive Media Tools and Students' Engagement**

Interactive media tools have been shown to significantly enhance student engagement by

promoting active participation in the learning process. Crompton and Burke (2020) conducted a systematic review and concluded that mobile interactive tools and gamified platforms increase behavioural and affective engagement by encouraging continuous learner interaction. Similarly, Bovermann and Bastiaens (2020) found that learners who used interactive dashboards and self-testing tools demonstrated higher levels of cognitive engagement compared to those using static instructional materials. These findings suggest that interactivity increases learner engagement through frequent interaction with content which enhances retention and understanding.

In a more recent study, Onuoha (2024) observed that tools such as simulation-based learning and interactive infographics promote deeper cognitive engagement by encouraging active problem-solving and critical thinking. The study further suggests that engagement in digital learning environments is shaped by the level of interaction between learners and instructional media. Overall, the literature indicates that interactive media tools enhance engagement by transforming learners from passive recipients into active participants. This has important implications for improving engagement among distance learners at Ahmadu Bello University.

### **Academic Support and Distance Learners' Engagement**

Academic support is a key determinant of student engagement in distance learning environments. Lee and Song (2021) found that learners who received personalised feedback and accessed online tutoring were significantly more likely to report high levels of emotional engagement. Such support helps maintain motivation and reduces feelings of disconnection.

Similarly, Bawa (2019) argues that academic support reduces the cognitive load

experienced by distance learners, enabling them to focus more effectively on learning tasks. This is particularly important in online environments where learners must independently manage their learning. Further evidence from Ibrahim and Shehu (2022) indicates that timely feedback and e-tutoring significantly enhance learners' affective engagement by strengthening their sense of institutional support and belonging. Collectively, these studies demonstrate that academic support functions as both a cognitive and emotional enabler of engagement. This underscores its importance in sustaining learner participation in distance education programmes such as those at Ahmadu Bello University.

### **Technical Support and Distance Learners' Engagement**

Technical support is a fundamental requirement for effective engagement in distance learning environments. Adnan and Anwar (2020) reported that inadequate technical infrastructure and support are associated with increased anxiety and behavioural disengagement among students. Conversely, Al-Fraihat et al. (2020) found that system quality, including technical support and reliability, significantly predicts user satisfaction and continued engagement. These findings suggest that technical support provides the foundation for effective participation in online learning.

In the Nigerian context, Adetunde and Olufemi argue that many challenges associated with collaborative learning in distance education stem from technical limitations rather than pedagogical issues. Learners who experience minimal technical barriers are more likely to actively participate in collaborative and knowledge-sharing activities. Similarly, Okonkwo (2021) emphasises that technical support is essential for sustaining engagement by ensuring consistent access to digital learning

platforms. Overall, the literature indicates that technical support serves as the infrastructural backbone of distance learning, enabling the effective implementation of other engagement strategies.

### **Research Methodology**

This section presents the entire procedure used in the study: the research design, population of the study, sample and sampling techniques, research instrument, validity and reliability of the research instrument, procedure for data collection and methods of data analysis.

#### **Research Design**

This study adopted correlational survey research design. According to Creswell and Creswell (2018), a survey design provides a quantitative or numeric description of trends, attitudes, or opinions of a population by studying a sample of that population. The choice of this design is justified because it allows the researcher to collect data from a large number of distance learners across different geographic locations without manipulating the variables.

#### **Population of the Study**

The population for this study comprised all undergraduate distance learners enrolled at the Ahmadu Bello University's Distance Learning Centre (ABU-DLC), Zaria. As of the 2023/2024 academic session, the estimated population of active learners across Management Sciences, Social Sciences, and Arts was approximately 12,500 students.

#### **Sample and Sampling Techniques**

Based on the Krejcie and Morgan (1970) sample size determination table, a population of approximately 12,500 students requires a minimum sample of 373 respondents. To compensate for possible non-response bias

associated with online surveys, the sample size was increased to 450 students. To enhance adequate representation of students from diverse academic backgrounds, the population was stratified by faculty and department, a procedure that helps reduce sampling error by proportionally including key subgroups (Neuman, 2020). Within each stratum, participants were selected using simple random sampling to give all eligible students an equal chance of participation.

#### **Instruments for Data Collection**

The instrument used for data collection is a self-developed structured questionnaire titled: "Active Learning, Support Services, and Engagement Questionnaire (ALSEQ)." The instrument is divided into four main sections: Section A: Demographic Data: Captures the gender, level of study, and department of the respondents. Section B: Active Learning Strategies Scale: Measures the frequency and quality of interaction with Collaborative Learning and Interactive Media Tools (10 items). Section C: Institutional Support Services Scale: Evaluates student perception of academic support (feedback, e-tutoring) and technical support (help-desk responsiveness) (10 items). Section D: Student Engagement Scale: Based on the framework by Fredricks et al. (2016), this section measures Behavioural, Cognitive, and Affective Engagement (15 items). All items in Sections B, C, and D are measured on a four-point Likert scale: Strongly Agree (4), Agree (3), Disagree (2), and Strongly Disagree (1).

#### **Validity of the Instrument**

To ensure face and content validity, the draft instrument was subjected to scrutiny by three experts: two from the Department of Educational Technology, and one from the Distance Learning Centre, ABU Zaria. Their suggestions regarding

the clarity of language and the alignment of items with the research questions were incorporated into the final version (Cohen, Manion, & Morrison, 2018).

### **Reliability of the Instrument**

To determine the internal consistency of the instrument, a pilot study was conducted using 40 distance learners from a different institution (National Open University of Nigeria) who share similar characteristics with the target population. The data collected were analysed using Cronbach's Alpha ( $\alpha$ ). A reliability coefficient of 0.82 was obtained for the overall instrument, which is well above the 0.70 threshold recommended by Saunders, Lewis, and Thornhill (2019), indicating that the instrument is highly reliable.

### **Procedure for Data Collection**

Owing to the wide geographical distribution of the respondents, data collection was carried out using an online questionnaire administered through Google Forms. Prior to data collection, ethical clearance was obtained from the Director of the Ahmadu Bello University Distance Learning Centre. A total of 450 questionnaires were administered by distributing the survey link through the official ABU-DLC student Telegram groups and institutional email platforms. The first page of the online questionnaire contained an informed consent statement, which informed participants of the voluntary nature of the study and assured them of confidentiality and anonymity of their responses. To enhance the

response rate, follow-up reminders were sent at one-week intervals over a four-week period. A total of 450 copies were distributed electronically, and 412 valid responses were retrieved, representing a 91.5% response rate. This high rate ensures that the findings are representative of the target population (Creswell & Creswell, 2018).

### **Method of Data Analysis**

The data collected were cleaned, coded, and entered into the Statistical Package for the Social Sciences (SPSS) version 27 for analysis. Data analysis was conducted using inferential statistics, particularly Pearson Product-Moment Correlation (PPMC) to test the hypotheses concerning the relationships between the independent and the dependent variables. All hypotheses were tested at the 0.05 level of significance.

### **Data Presentation, Analysis and Discussion of Findings**

This section presents the analysis of data collected from the field and its subsequent discussion of findings generated therefrom.

### **Test of Hypotheses**

This section presents the results of the four null hypotheses tested at a .05 level of significance using Chi-Square statistical tool.

H0<sub>1</sub>: Collaborative learning has no significant relationship with distance learners' engagement.

**Table 1: Collaborative Learning and Distance Learners' Engagement**

| Variable                      | Mean  | Sd   | N   | Df  | r-cal. | P-value | Remark                      |
|-------------------------------|-------|------|-----|-----|--------|---------|-----------------------------|
| Collaborative Learning        | 22.14 | 3.12 | 412 | 410 | .62    | .001    | H <sub>01</sub><br>Rejected |
| Distance Learners' Engagement | 20.19 | 5.27 |     |     |        |         |                             |
| P<0.05                        |       |      |     |     |        |         |                             |

A Pearson Product-Moment correlation was conducted to examine the relationship between collaborative learning and distance learners' engagement. The result showed a strong, positive, and statistically significant relationship between

the two variables ( $r = 0.62$ ,  $p < .05$ ). Consequently, the null hypothesis (H<sub>01</sub>) was rejected, indicating that collaborative learning significantly related to distance learners' engagement at Ahmadu Bello University.

**H<sub>02</sub>:** There is no significant relationship between interactive media tools and distance learners' engagement.

**Table 2***Interactive Media Tools and Distance Learners' Engagement*

| Variable                      | Mean  | Sd   | N   | Df  | r-cal. | P-value | Remark                      |
|-------------------------------|-------|------|-----|-----|--------|---------|-----------------------------|
| Interactive Media Tools       | 16.13 | 4.01 | 412 | 410 | .73    | .001    | H <sub>02</sub><br>Rejected |
| Distance Learners' Engagement | 20.19 | 5.27 |     |     |        |         |                             |
| P<0.05                        |       |      |     |     |        |         |                             |

A Pearson Product-Moment correlation was conducted to examine the relationship between interactive media tools and distance learners' engagement. The result showed a strong, positive, and statistically significant relationship between the two variables ( $r = 0.73$ ,  $p < .05$ ). Consequently, the null hypothesis (H<sub>02</sub>) was rejected, indicating that interactive media tools significantly related to distance learners' engagement at Ahmadu Bello University.

**H0<sub>3</sub>:** Academic support services have no significant relationship with distance learners' engagement.

**Table 3: Academic Support Service and Distance Learners' Engagement**

| Variable                      | Mean  | Sd   | N   | Df  | r-cal. | P-value | Remark          |
|-------------------------------|-------|------|-----|-----|--------|---------|-----------------|
| Academic Support Service      | 18.01 | 4.34 | 412 | 410 | .81    | .000    | H0 <sub>3</sub> |
| Distance Learners' Engagement | 20.19 | 5.27 |     |     |        |         | Rejected        |
| P<0.05                        |       |      |     |     |        |         |                 |

A Pearson Product-Moment correlation was conducted to examine the relationship between academic support service and distance learners' engagement. The result showed a strong, positive, and statistically significant relationship between the two variables ( $r = 0.81$ ,  $p < .05$ ). Consequently, the null hypothesis (H0<sub>3</sub>) was rejected, indicating that academic support service significantly related to distance learners' engagement at Ahmadu Bello University.

**H0<sub>4</sub>:** There is no significant relationship between technical support service and distance learners' engagement.

**Table 4: Technical Support Service and Distance Learners' Engagement**

| Variable                      | Mean  | Sd   | N   | Df  | r-cal. | P-value | Remark          |
|-------------------------------|-------|------|-----|-----|--------|---------|-----------------|
| Technical Support Service     | 18.33 | 6.10 | 412 | 410 | .88    | .001    | H0 <sub>4</sub> |
| Distance Learners' Engagement | 20.19 | 5.27 |     |     |        |         | Rejected        |
| P<0.05                        |       |      |     |     |        |         |                 |

A Pearson Product-Moment correlation was conducted to examine the relationship between technical support service and distance learners' engagement. The result showed a strong, positive, and statistically significant relationship between the two variables ( $r = 0.88$ ,  $p < .05$ ). Consequently, the null hypothesis (H0<sub>4</sub>) was rejected, indicating that technical support service significantly related to distance learners' engagement at Ahmadu Bello University.

### Discussion of Findings

The first finding showed that collaborative learning significantly related to distance learners' engagement at ABU Zaria. This finding aligns with the work of Yusuf (2021) who argued that collaborative learning bridges transactional distance by fostering peer interaction and emotional engagement. However, as noted by Okafor (2021), collaborative learning requires structured facilitation and clear roles to prevent social loafing and ensure equitable participation. In distance education, collaborative activities such as group projects, peer reviews, and

discussion forums create a sense of social presence and shared academic responsibility, which are crucial for reducing isolation and enhancing cognitive and affective engagement. The significant relationship reported in this study suggests that ABU's distance learners value peer interaction, but its effectiveness depends on intentional instructional design and academic support.

The second finding also indicated that interactive media tools significantly related to distance learners' engagement. This resonates with Crompton and Burke (2020), who found that interactive tools such as simulations, quizzes, and virtual labs increase behavioural and cognitive engagement by requiring active learner participation. However, as Khan and Al-Khouly (2024) cautioned, interactive tools alone are insufficient without reliable technical support and clear academic guidance. In the ABU context, where learners often face technological constraints, the use of well-designed interactive media can enhance motivation and deepen learning. The significant relationship found in this study underscores the potential of interactive media to engage learners, provided they are supported by robust institutional systems.

The third finding showed that academic support service significantly related to distance learners' engagement. This is consistent with Ibrahim and Shehu (2022) who emphasised that timely, personalised academic feedback and e-tutoring reduce psychological distance and increase affective engagement. In distance learning, where learners often feel orphaned by the system, responsive academic support serves as a motivational scaffold that sustains commitment and cognitive effort. This finding aligns with Self-Determination Theory, which posits that support services fulfil learners' needs for competence and relatedness, thereby enhancing intrinsic motivation (Ryan & Deci,

2018). However, as Chigozie and Nwosu (2022) noted, academic support must be adaptive and proactive to address the diverse needs of distance learners, especially in a large-scale system like ABU's.

Finally, finding number four indicated that technical support significantly related to distance learners' engagement. This supports the work of Gambo (2020) and Adetunde and Olufemi (2023), who argued that technical reliability is a foundational enabler of engagement in distance education. The finding aligns with the Technology Acceptance Model, which highlights perceived ease of use and facilitating conditions as key determinants of system adoption and continued use (Davis, 1989). However, as Bichi (2024) observed, technical support must be mobile-responsive and inclusive to accommodate learners who rely on smartphones for access. In Northern Nigeria, where infrastructure challenges such as power outages and poor internet connectivity are common, responsive technical support is critical to preventing frustration and disengagement. The significant relationship between technical support and distance learners' engagement established in this study underscores the role of technical support as a determinant of students' engagement.

## **Conclusion**

Based on the findings of this study, it is concluded that Distance Learners' Engagement at Ahmadu Bello University, Zaria, was significantly influenced by the deliberate implementation of Active Learning Strategies and robust Support Services. Collaborative learning fosters social interaction and cognitive depth, while interactive media tools promote behavioural and emotional involvement. Academic support, through timely feedback and tutoring, sustains cognitive engagement, and technical support ensures seamless access and reduces frustration. The

integration of these elements creates an enabling environment that addresses the psychological needs of autonomy, competence, and relatedness as explained by Self-Determination Theory. Therefore, to optimise engagement in distance education, institutions must synergistically combine innovative teaching methods with comprehensive student support.

### Recommendations for Policy Directions

Based on the conclusions drawn, the following recommendations are made for policy direction:

1. The Directorate of Distance Learning at ABU Zaria should institutionalise structured collaborative learning activities backed with policy formulation.
2. Faculty should formulate policies that will ensure effective integration of interactive media tools into course design to increase behavioural interaction and emotional investment in learning.
3. Academic support mechanisms, including timely feedback, virtual tutoring, and proactive academic advising, should be strengthened and consistently monitored to sustain learner motivation and cognitive engagement.
4. Technical support services should be enhanced through 24/7 helpdesk availability, mobile-optimised troubleshooting guides, and regular system upgrades to ensure reliable and accessible learning platforms.
5. The University Management should adopt an integrated support model where academic, technical, and administrative services work collaboratively to create a holistic and responsive learner support ecosystem.

### References

- Abdullahi, K. R. (2021). Technical reliability and the social engagement of distance learners during synchronous interactive sessions. *African Journal of Pedagogy and Technology*, 9(1), 67–82.
- Adebayo, M. T., & Olawale, S. T. (2023). Promoting active participation and interaction in online learning environments through collaborative activities. *International Journal of Educational Technology in Higher Education*, 20(1), 1–18.
- Adeleke, T. R. (2018). Flipping the remote classroom: Active learning in Nigerian distance education. *Journal of Open and Distance Learning*, 10(2), 45–60.
- Adetunde, A. O., & Olufemi, O. J. (2023). Support services and the adoption of collaborative learning strategies among distance learners in North-Central Nigeria. *West African Journal of Open and Flexible Learning*, 11(1), 89–107.
- Adeyemi, K. R., & Sani, L. (2022). Adaptive instructional support and cognitive engagement of distance learners in Northern Nigeria. *West African Journal of Open and Flexible Learning*, 10(1), 66–82.
- Adnan, M., & Anwar, K. (2020). Online learning amid the COVID-19 pandemic: Students' perspectives. *Journal of Pedagogical Sociology and Psychology*, 2(1), 45–51.
- Ahmed, K. S. (2024). Virtual mentoring and the academic engagement of distance learners in Northern Nigerian Federal Universities. *Nigerian Journal of Educational Leadership*, 10(1), 12–28.
- Akpan, O. E. (2021). Fostering metacognition and self-regulated learning: The role of structured reflective journals in online courses. *Journal of Applied Research in Higher Education*, 13(2), 205–221.

- Al-Fraihat, D., Joy, M., Masa'deh, R., & Sinclair, J. (2020). Evaluating e-learning systems success: An empirical study. *Computers in Human Behaviour*, 102, 67–86.
- Aliyu, I., Owoicho, A. G., & Musa, S. N. (2024). Application of unified theory of acceptance and use of technology to learning management system use. *International Journal of Research and Innovation in Social Science*, 8(1), 173–182.
- Aminu, S. A. (2024). Social media as a supplemental support tool. *Journal of Online Learning Research*, 10(1), 44–62.
- Amanchukwu, R. N., et al. (2022). *Digital Education and the Sustainable Development Goals in Nigeria*. African Academic Press.
- Auta, M. Z. (2024). Gamification as an active learning strategy. *International Journal of Emerging Technologies in Learning*, 19(1), 102–118.
- Balogun, O. S. (2022). Digital literacy and active learning engagement among distance learners. *Journal of Digital Learning in Teacher Education*, 38(2), 76–92.
- Bashir, L. M., & Garba, A. U. (2023). Automated feedback systems and cognitive engagement. *Journal of Instructional Technology*, 15(2), 45–61.
- Bawa, P. (2019). Using scaffolding with the community of inquiry framework. *International Journal on E-Learning*, 18(2), 155–181.
- Bello, A. (2022). *Infrastructural Challenges in Northern Nigerian Distance Education*. Zaria University Press.
- Bello, A. S., & Ahmed, M. (2023). *Evaluating the synergy between academic support and interactive media in ABU's Distance Learning Center*. Ahmadu Bello University Press.
- Bello, G. Y., & Audu, M. (2020). Institutional technical reliability and collaborative projects. *Journal of African Educational Research and Development*, 8(3), 112–129.
- Bichi, A. A. (2024). Mobile learning support and behavioural engagement. *Journal of Educational Technology and Research*, 12(2), 115–130.
- Bond, M. (2020). Facilitating student engagement through flipped learning. *Computers & Education*, 151, 103819.
- Bovermann, K., & Bastiaens, T. J. (2020). Learning analytics dashboards for learners. *Electronic Journal of e-Learning*, 18(2), 110–120.
- Chigozie, K. S., & Nwosu, J. C. (2022). Student-centered support services and cognitive engagement. *Journal of African Open Learning*, 11(2), 45–60.
- Chukwu, A. K., & Mbah, P. A. (2024). Dynamic interactive media and student engagement. *African Journal of Educational Studies*, 18(1), 45–60.
- Cohen, L., Manion, L., & Morrison, K. (2018). *Research Methods in Education* (8th ed.). Routledge.
- Creswell, J. W., & Creswell, J. D. (2018). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (6th ed.). SAGE Publications.
- Daniel, K. I., & Okorafor, P. N. (2022). Cloud-based academic support. *African Journal of Distance Education*, 9(2), 115–131.
- Eze, S. C., Chinedu-Eze, V. C., & Bello, A. O. (2018). Determinants of student engagement in e-learning systems. *Education and Information Technologies*, 23(6), 2835–2858.
- Fabunmi, F. A., & Asiru, M. A. (2022). Institutional support services and engagement. *Nigerian Journal of Educational Management*, 6(1), 22–38.

- Federal Ministry of Education (FME). (2020). *National policy framework for tertiary distance education in Nigeria*. Abuja: Author.
- Flores, B. E., et al. (2025). Promoting online teaching through active learning strategies. *Frontiers in Education*, 10.
- Fredricks, J. A., et al. (2016). *Student Engagement in School: Theory, Research, and Policy*.
- Fredricks, J. A., Filsecker, M., & Lawson, M. A. (2016). Student engagement, context, and instrument. *Educational Psychologist*, 51(1), 1–23.
- Gambo, M. J. (2020). Digital support services and engagement at ABU DLC. *Nigerian Journal of Distance Education*, 5(2), 112–128.
- Garba, S. A., & Ahmad, M. S. (2022). Tutor-led academic support and collaborative learning. *International Journal of Instruction*, 15(3), 441–458.
- Hernandez-Selles, N., et al. (2019). Computer-supported collaborative learning. *Computers & Education*, 138, 1–12.
- Hewitt, K. (2022). *The Engaged Distance Learner*. Routledge.
- Ibrahim, A. S. (2019). Promoting cognitive engagement in asynchronous courses. *African Journal of Educational Technology*, 4(1), 112–128.
- Ibrahim, L., & Musa, H. A. (2020). Technical support infrastructure and retention. *Journal of Distance Education and e-Learning*, 5(3), 112–125.
- Ibrahim, L. K., & Shehu, R. A. (2022). Academic support services and engagement at ABU DLC. *Journal of Education and Practice*, 13(4), 112–126.
- Kearsley, G., & Shneiderman, B. (1998). Engagement theory. *Educational Technology*, 38(5), 20–23.
- Khan, A., & Al-Khouly, M. (2024). Interactive media and student support. *International Journal of Educational Technology in Higher Education*, 21(1), 12–29.
- Kothari, C. R., & Garg, G. (2019). *Research Methodology: Methods and Techniques* (4th ed.). New Age International.
- Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size. *Educational and Psychological Measurement*, 30(3), 607–610.
- Martin, F., & Bolliger, D. U. (2018). Engagement strategies in online learning. *Online Learning*, 22(1), 205–222.
- Miller, K. R., Chen, Q., & Rodriguez, M. A. (2022). Distance learning retention strategies. *International Review of Distance Education*, 25(3), 201–218.
- Misseyanni, A., et al. (2018). *Active Learning Strategies in Higher Education*. Emerald.
- Mukhtar, S. H. (2024). Peer-to-peer technical mentoring. *Journal of Digital Innovation in Open Learning*, 11(1), 15–33.
- Neuman, W. L. (2020). *Social Research Methods* (8th ed.). Pearson.
- Nwachukwu, O. I., et al. (2022). Mental wellness among adult distance learners. *Counselling Psychology Quarterly*, 35(5), 891–907.
- Nwosu, C. O., & Chinedu, I. P. (2023). Accessibility audit of student support services. *Journal of Higher Education Access and Policy*, 8(1), 77–94.
- Ogundipe, S. E. (2023). Tri-dimensional construct of learner engagement. *Journal of Educational Psychology and Practice*, 14(4), 411–429.
- Okonkwo, A. F., & Ndubuisi, K. O. (2023). Timely feedback and academic tutoring. *IRRODL*, 24(4), 118–137.
- Ojo, L. M., & Bello, F. K. (2020). Predictors of procrastination and attrition. *Distance Education Review*, 12(4), 18–35.

- Pallant, J. (2020). *SPSS Survival Manual* (7th ed.). McGraw-Hill.
- Qayyum, A., & Zawacki-Richter, O. (2019). *Open and Distance Education in Asia, Africa and Oceania*. Springer.
- Ryan, R. M., & Deci, E. L. (2018). *Self-Determination Theory*. Guilford.
- Saunders, M. N., Lewis, P., & Thornhill, A. (2019). *Research Methods for Business Students* (8th ed.). Pearson.
- Tadesse, S., & Muluye, W. (2020). Technical support and student satisfaction in e-learning. *Journal of Digital Pedagogy*.
- Tadesse, S., & Muluye, W. (2020). Technical support, system quality, and engagement. *Education and Information Technologies*, 25(6), 5635–5651.
- Usman, S. (2024). Administrative efficacy and learner satisfaction. *Higher Education Quarterly*, 78(1), 98–117.
- Wang, L., & Chen, H. (2024). Digital transformation and higher education. *World Education Review*, 10(1), 1–18.
- Yakubu, A. M. (2022). Learner engagement scale validation. *Online Learning Journal*, 26(3), 245–260.
- Zepke, N. (2018). Student engagement in higher education. *International Journal of Educational Research*, 87, 119–130.