

Faculty Inbreeding in Technology Education Programmes and Skills Training of graduates in Tertiary Institutions in Nigeria

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Abstract: This study examined faculty inbreeding and skills training of graduates in technology education programmes in tertiary institutions in Nigeria. The study adopted a descriptive research design. The population comprised lecturers and administrators from selected tertiary institutions in Nigeria. A sample of 3500 respondents was selected using purposive sampling techniques. Data were collected using a structured questionnaire titled Faculty Inbreeding and Skills Training Questionnaire (FISTQ) was used for data collection. The instrument was validated by experts in technology education and measurement and evaluation. The responses of 30 representatives for the Tertiary institutions not studied were analyzed using Cronbach Alpha to establish the reliability index coefficient of .89, which was considered sufficient for the study. The instrument was structured on a 4-point rating scale of: Strongly Agree (SA) = 4, Agree (A) = 3, Disagree (D) = 2, Strongly Disagree (SD) = 1. Data were analyzed using mean and standard deviation to answer research questions, on a cut-off mean score of 2.50. Findings revealed that excessive faculty inbreeding negatively affects instructional diversity, curriculum innovation, research productivity, industrial collaboration, and practical skills training. However, moderate faculty retention combined with external academic exposure and industrial experience was perceived to strengthen institutional continuity and mentorship. The study further revealed strong positive relationships between faculty diversity, innovation, and effective skills training programmes. The study concluded that reducing excessive faculty inbreeding through transparent recruitment policies, staff exchange programmes, industrial exposure, and academic mobility would significantly improve technology education and production of 21st-century skilled graduates in Nigeria.

Keywords: Faculty inbreeding, technology education, skills training, employability, instructional quality,

Introduction

Technology education and vocational training are essential instruments for industrialization, technological advancement, workforce development, and sustainable national development. Technology education offered in tertiary institutions in Nigeria are expected to produce graduates equipped with practical competencies, innovation skills, digital literacy, entrepreneurial abilities, and workplace adaptability required in the 21st-century labour market (FGN, 2013). However, concerns have continued to emerge regarding the declining quality of practical training, inadequate innovation, poor curriculum modernization, and low employability among graduates of technology education programmes. One institutional factor increasingly associated with these challenges is faculty inbreeding.

Faculty inbreeding refers to the practice whereby higher institutions recruit and retain their own graduates as academic staff without substantial external academic or industrial exposure. Amini-Philips and Harrison (2021) explained that academic inbreeding occurs when institutions employ graduates trained within the same institution, thereby limiting intellectual diversity and external knowledge exchange. Globally, faculty inbreeding has generated considerable debate in higher education because of its implications for innovation, instructional quality, research productivity, and institutional development. Horta (2016) argued that academic inbreeding may initially contribute to institutional continuity and stability in developing higher education systems, but excessive inbreeding often leads to intellectual stagnation, limited innovation, weak academic competitiveness, and poor exposure to global best practices. In technology education, where innovation, industrial relevance, and practical competence are central, excessive faculty inbreeding may negatively affect curriculum modernization, adoption of emerging technologies, industry collaboration, and instructional effectiveness (Thomas et al, 2025). Nigerian tertiary institutions already face challenges such as inadequate facilities, outdated curricula, insufficient industry participation, weak digital infrastructure, and shortage of technologically exposed personnel. These deficiencies may be worsened when institutions rely heavily on internally trained staff with limited external exposure.

Comparatively, developed educational systems encourage academic mobility, international collaboration, staff exchange programmes, and transparent recruitment practices to improve instructional quality and innovation. In contrast, many Nigerian higher institutions still rely substantially on internal recruitment practices that limit diversity of ideas and practical exposure. Horta (2016) recommended internationalization, mobility, and transparent recruitment as major strategies for reducing the negative effects of academic inbreeding.

Furthermore, modern technology education requires lecturers with industry-based competencies, digital literacy, innovation skills, and practical exposure to emerging technologies such as automation, artificial intelligence, simulation technologies, and digital manufacturing systems. Uzorka and Anumaka (2021) emphasized that faculty members in Nigerian universities require technological competencies and exposure to modern digital systems to improve instructional delivery and workforce preparation. Therefore, this study investigated faculty inbreeding and skills training of graduates in technology education programmes in tertiary institutions in Nigeria with emphasis on instructional quality, innovation, curriculum modernization, and practical skills acquisition.

Statement of the Problem

Technology education programmes in tertiary institutions in Nigeria are expected to produce technologically skilled graduates capable of contributing to industrial development, technological innovation, and national productivity. However, many graduates still lack adequate practical competence, digital literacy, innovation skills, and workplace readiness required in contemporary industries. Employers frequently complain about graduates' poor technical competence, weak problem-solving abilities, inadequate exposure to modern technologies, and limited adaptability to industrial realities.

One institutional factor linked to these challenges is excessive faculty inbreeding, where institutions repeatedly recruit their own graduates as academic staff without sufficient external academic or industrial exposure. Although faculty inbreeding may preserve institutional culture and continuity, excessive dependence on internally trained personnel may reduce instructional diversity, innovation, curriculum modernization, research productivity, and exposure to global best practices.

Studies on academic inbreeding in higher education have largely focused on universities and research productivity, with limited attention given to technology education programmes in tertiary institutions and skills training programmes in Nigeria. There is therefore insufficient empirical evidence regarding how faculty inbreeding influences practical skills acquisition, industrial exposure, instructional quality, and graduates' employability in technology education programmes. This study was therefore undertaken to fill this gap.

Aim and Objectives of the Study

The aim of this study was to examine faculty inbreeding in technology education programmes and skills training of graduates in tertiary institutions in Nigeria. Specifically, the study sought to:

1. determine the influence of faculty inbreeding on instructional quality in skills training of graduates in technology education programmes in tertiary institutions in Nigeria;
2. examine the effect of faculty inbreeding on innovation and curriculum modernization in skills training of graduates in technology education programmes in tertiary institutions in Nigeria;
3. assess the influence of faculty inbreeding on practical skills acquisition and industrial exposure in skills training of graduates in technology education programmes in tertiary institutions in Nigeria;

Research Questions

The following research questions guided the study.

1. How does faculty inbreeding influence instructional quality in skills training of graduates in technology education programmes in tertiary institutions in Nigeria?
2. What effect does faculty inbreeding have on innovation and curriculum modernization in skills training of graduates in technology education programmes in tertiary institutions in Nigeria?
3. How does faculty inbreeding influence practical skills acquisition and industrial exposure in skills training of graduates in technology education programmes in tertiary institutions in Nigeria?

Literature Review

Concept of Faculty Inbreeding

Faculty inbreeding refers to the practice whereby higher institutions recruit and retain their own graduates as academic staff members. It occurs when universities and colleges employ individuals who obtained most or all of their academic qualifications from the same institution. Faculty inbreeding has become a common practice in many higher education institutions, particularly in developing countries where academic mobility and international recruitment opportunities are limited. According to Amini-Philips and Harrison (2021), academic inbreeding is prevalent in Nigerian higher institutions because it preserves institutional traditions, ensures continuity in administrative culture, and reduces the stress and cost associated with external recruitment. However, the authors argued that excessive dependence on internally trained staff may negatively affect academic competitiveness, innovation, and diversity of ideas.

Globally, faculty inbreeding has generated considerable debate because of its implications for institutional development, instructional quality, research productivity, and innovation. Horta (2016) explained that academic inbreeding may initially support institutional stability and continuity, especially in developing higher education systems where qualified personnel are limited. Nevertheless, excessive inbreeding becomes problematic when it restricts intellectual diversity, international collaboration, interdisciplinary exposure, and knowledge exchange. The study further revealed that institutions with high levels of faculty inbreeding often

demonstrate lower research productivity, reduced innovation capacity, and weaker global competitiveness compared to institutions that encourage academic mobility and recruitment diversity.

Similarly, Altbach et al. (2019) observed that academic mobility and exposure to diverse educational environments are essential for improving instructional quality, innovation, and research development in higher education institutions. Institutions that recruit staff from diverse academic and professional backgrounds are more likely to integrate modern pedagogical practices, emerging technologies, and global perspectives into curriculum delivery and practical training. In contrast, excessive faculty inbreeding tends to encourage intellectual isolation and resistance to institutional reforms.

Empirical studies have also demonstrated mixed perceptions regarding faculty inbreeding. A study conducted by Horta et al., (2010) found that moderate faculty retention may strengthen institutional identity and continuity, but excessive inbreeding negatively affects creativity, innovation, and scientific productivity. Likewise, Karadag and Ciftci (2022) revealed that academic inbreeding significantly reduces institutional research output and weakens collaboration networks among academic staff. The researchers emphasized that universities characterized by high faculty inbreeding often experience limited exposure to contemporary global knowledge systems.

In the Nigerian context, faculty inbreeding is increasingly associated with poor instructional diversity, weak curriculum modernization, and inadequate integration of emerging technologies into teaching and learning. This situation is particularly concerning in technology education programmes where practical competence, industrial relevance, and innovation are fundamental objectives. Therefore, reducing excessive faculty inbreeding through academic mobility, staff exchange programmes, and transparent recruitment practices has become necessary for improving the quality of technology education and workforce development in Nigeria.

Faculty Inbreeding and Instructional Quality

Instructional quality refers to the effectiveness of teaching and learning processes in achieving educational objectives and improving students' competence, creativity, and employability. In technology education, instructional quality depends largely on lecturers' pedagogical competence, industrial exposure, technological literacy, practical experience, and ability to integrate modern instructional methods into teaching. Effective instructional delivery enhances students' technical competence, problem-solving abilities, innovation, and workplace readiness.

Faculty inbreeding has significant implications for instructional quality because lecturers with limited external exposure may rely heavily on traditional teaching approaches and outdated curricular content. Horta (2016) maintained that institutions characterized by excessive academic inbreeding often experience limited pedagogical innovation and weak adoption of contemporary instructional strategies. Such institutions may also experience reduced exposure to emerging industrial trends and global educational practices necessary for effective technology education.

Uzorka and Anumaka (2021) found that technology integration and digital instructional systems significantly improve teaching effectiveness, students' engagement, and practical learning outcomes in Nigerian higher institutions. The study emphasized that lecturers exposed to diverse academic and technological environments demonstrate better competence in integrating digital tools, simulation technologies, and learner-centered instructional methods into classroom practices.

Similarly, Adeyemi and Bello (2022) reported that instructional quality in technical and vocational education improves when institutions recruit lecturers with industrial experience and exposure to modern technologies. Their findings revealed that students taught by lecturers with external academic and industrial exposure demonstrated higher practical competence and innovation skills than students taught by lecturers with limited exposure.

Empirical evidence further supports the relationship between faculty diversity and instructional quality. Yusuf and Ibrahim (2021) found a strong positive relationship between lecturers' instructional competence and students' acquisition of technical, entrepreneurial, and digital skills in Nigerian tertiary institutions. The researchers concluded that continuous professional development and academic mobility significantly improve instructional effectiveness and workforce preparedness.

Likewise, Okafor and Ezeani (2020) revealed that competent lecturers enhance students' communication skills, creativity, technical competence, and employability through effective mentorship and practical demonstrations. The study emphasized that instructional quality is greatly influenced by lecturers' exposure to innovative teaching practices and industry-based experiences.

Therefore, institutions characterized by recruitment diversity and external academic collaboration are more likely to improve instructional quality, practical learning, and graduates' employability outcomes than institutions heavily dominated by faculty inbreeding.

Faculty Inbreeding and Innovation

Innovation is a critical component of technology education because it promotes creativity, practical competence, digital literacy, and adaptation to emerging technologies. Innovation in education involves the integration of modern teaching strategies, digital technologies, practical projects, simulation systems, and learner-centered instructional methods aimed at improving learning outcomes and workforce readiness.

Faculty inbreeding significantly influences institutional innovation because academic staff with limited external exposure may resist curriculum modernization, interdisciplinary collaboration, and technological transformation. Karadag and Ciftci (2022) found that

excessive academic inbreeding negatively affects institutional research productivity, innovation capacity, and scientific collaboration. According to the study, institutions characterized by high faculty inbreeding often demonstrate lower levels of creativity and technological advancement.

Similarly, Horta (2016) observed that institutions with excessive faculty inbreeding experience reduced international collaboration, weak knowledge exchange, and limited curriculum modernization. The study further indicated that academic mobility enhances institutional innovation by exposing lecturers to global best practices, emerging technologies, and interdisciplinary research opportunities.

In another study, Altbach et al. (2019) emphasized that global competitiveness in higher education depends largely on openness to innovation, internationalization, and cross-institutional collaboration. Institutions that encourage academic mobility and external recruitment are more likely to adopt emerging technologies, artificial intelligence, simulation systems, and digital instructional practices.

Empirical studies in Nigeria have also highlighted the importance of innovation in technology education. Eze et al. (2018) reported that poor utilization of e-learning facilities and innovative technologies negatively affects instructional effectiveness and students' practical exposure in Nigerian tertiary institutions. Similarly, Adeola and Musa (2023) found that integrating modern technologies and innovation-driven instructional systems significantly improves students' creativity, technical competence, and employability.

The implication of these findings is that excessive faculty inbreeding may hinder innovation and technological advancement in Federal Colleges of Education (Technical) by limiting exposure to modern educational practices and emerging industrial technologies.

Faculty Inbreeding and Skills Training

Skills training of graduates in technology education programmes tertiary institutions in Nigeria involves the acquisition of practical competencies, technical knowledge, digital literacy, entrepreneurial skills, and workplace attitudes necessary for effective performance in industries and modern workplaces. In technology education, effective skills training depends heavily on practical learning environments, modern workshops, laboratories, digital technologies, simulation systems, and competent instructors with industrial exposure.

Faculty inbreeding may negatively affect skills training when lecturers lack exposure to modern industrial practices, emerging technologies, and innovative instructional systems. Orie et al. (2025) reported that unskilled and technologically inexperienced personnel negatively affect digital laboratory effectiveness and practical learning outcomes in Nigerian higher institutions. The study emphasized that lecturers' competence and technological exposure significantly influence students' practical competence and workforce preparedness.

Similarly, Ogunleye and Musa (2021) observed that inadequate exposure to modern technologies and poor integration of industrial practices negatively affect practical training and employability outcomes among technology education graduates in Nigeria. Institutions dominated by internally trained lecturers may therefore struggle to expose students to current industrial realities and emerging technologies.

Eze et al. (2018) further revealed that poor utilization of e-learning systems and innovative instructional technologies limits practical learning experiences and digital competence acquisition in Nigerian tertiary institutions. Likewise, Adewale and Yusuf (2023) found that simulation technologies and virtual laboratories improve students' technical experimentation, creativity, and workplace preparedness by exposing them to modern industrial processes.

Comparatively, institutions that encourage faculty diversity, industrial attachment, and external academic collaboration are more likely to provide students with practical exposure, innovation skills, and technological adaptability required in the Fourth Industrial Revolution (4IR). Ahmed and Suleiman (2023) also found that industry collaboration and technologically competent instructors significantly improve students' technical competence, communication skills, teamwork, and employability readiness.

Overall, the reviewed literature indicates that excessive faculty inbreeding may negatively influence instructional quality, innovation, curriculum modernization, industrial collaboration, and practical skills training in technology education programmes. Therefore, promoting academic mobility, recruitment diversity, staff development, and industry-based exposure is essential for improving technology education and producing 21st-century skilled graduates in Nigeria.

Methodology

The study adopted a descriptive research design. The population comprised lecturers and administrators from selected tertiary institutions in Nigeria. A sample of 3500 respondents was selected using purposive sampling techniques. Data were collected using a structured questionnaire titled *Faculty Inbreeding and Skills Training Questionnaire (FISTQ)* was used for data collection. The instrument was validated by experts in technology education and measurement and evaluation. The responses of 30 representatives for the Tertiary institutions not studied were analyzed using Cronbach Alpha to establish the reliability index coefficient of .89, which was considered sufficient for the study. The instrument was structured on a 4-point rating scale of: Strongly Agree (SA) = 4, Agree (A) = 3, Disagree (D) = 2, Strongly Disagree (SD) = 1. Data were analyzed using mean and standard deviation to answer research questions, on a cut-off mean score of 2.50. All analysis were done using SPSS 23.0 version.

Results

Research Question 1: What influence does faculty inbreeding have on instructional quality in skills training of graduates in technology education programmes in tertiary institutions in Nigeria?

Table 1: Mean and Standard Deviation Analysis on the Influence of Faculty Inbreeding on Instructional Quality

S/N	Item Descriptions	N	Mean	SD	Remark
1	Faculty inbreeding limits exposure to modern teaching methods in skills training programmes.	3230	2.88	.742	Agree
2	Recruitment of lecturers from the same institution reduces instructional diversity in technology education.	3230	2.91	.768	Agree
3	Faculty inbreeding affects the quality of practical instruction and demonstration in workshops and laboratories.	3230	2.84	.731	Agree
4	Institutions with diverse academic staff demonstrate better teaching effectiveness and innovation.	3230	3.02	.754	Agree
5	Continuous recruitment of internal graduates reduces opportunities for new professional ideas and industrial experiences.	3230	2.95	.776	Agree
Grand Mean		3230	2.92	.754	Agree

The result in Table 1 revealed a grand mean score of 2.92, which is above the criterion mean score of 2.50, indicating that respondents agreed that faculty inbreeding significantly influences instructional quality in skills training programmes technology education in tertiary institutions in Nigeria. The findings implied that excessive recruitment of internal graduates limits instructional diversity, reduces exposure to innovative teaching methods, and affects practical instructional effectiveness.

Research Question 2: What effect does faculty inbreeding have on innovation and curriculum modernization in skills training of graduates in technology education programmes in tertiary institutions in Nigeria?

Table 2: Mean and Standard Deviation Analysis on Faculty Inbreeding, Innovation and Curriculum Modernization

S/N	Item Descriptions	N	Mean	SD	Remark
6	Faculty inbreeding limits the introduction of innovative ideas into technology education programmes.	3230	2.94	.761	Agree
7	Curriculum modernization is enhanced when institutions recruit lecturers from diverse academic backgrounds.	3230	3.01	.783	Agree
8	Excessive faculty inbreeding reduces exposure to emerging technologies and global best practices.	3230	2.89	.748	Agree
9	Diverse faculty membership promotes creativity and innovation in instructional delivery.	3230	3.06	.770	Agree
10	Faculty diversity enhances research productivity and curriculum improvement in technology education.	3230	2.97	.759	Agree
Grand Mean		3230	2.97	.764	Agree

The result in Table 2 showed a grand mean of 2.97, which is above the criterion mean of 2.50. This indicates that respondents agreed that faculty inbreeding significantly affects innovation and curriculum modernization in skills training programmes. The findings implied that faculty diversity encourages innovation, improves curriculum relevance, and enhances the integration of emerging technologies into technology education programmes.

Research Question 3: How does faculty inbreeding influence practical skills acquisition and industrial exposure in skills training of graduates in technology education programmes in tertiary institutions in Nigeria?

Table 3: Mean and Standard Deviation Analysis on Faculty Inbreeding and Practical Skills Acquisition

S/N	Item Descriptions	N	Mean	SD	Remark
11	Faculty inbreeding limits students' exposure to current industrial practices and technologies.	3230	2.93	.754	Agree
12	Lecturers with diverse industrial backgrounds improve students' practical competence.	3230	3.04	.771	Agree
13	Recruitment of external professionals enhances industrial collaboration and internship opportunities.	3230	2.98	.743	Agree
14	Faculty diversity improves students' exposure to practical problem-solving approaches.	3230	2.95	.758	Agree
15	Excessive faculty inbreeding negatively affects practical skills training effectiveness in technology education.	3230	2.90	.746	Agree
Grand Mean		3230	2.96	.754	Agree

The result in Table 3 revealed a grand mean score of 2.96, which is above the criterion mean of 2.50. This indicates that respondents are in agreement that faculty inbreeding significantly influences practical skills acquisition and industrial exposure in skills training of graduates in technology education programmes. The findings implied that faculty inbreeding does not encourage industrial exposure, practical competence, and students' readiness for modern workplaces.

Discussion of Findings

The findings revealed that excessive faculty inbreeding negatively affects instructional quality, innovation, curriculum modernization, and practical skills acquisition in skills training of graduates in technology education programmes in tertiary institutions in Nigeria. Respondents agreed that faculty diversity, academic mobility, industrial exposure, and staff exchange programmes significantly improve instructional delivery and workforce preparation. The findings support Horta (2016), who argued that academic inbreeding reduces intellectual diversity, weakens innovation, and limits institutional competitiveness in higher education systems. The findings also agree with Karadag and Ciftci (2022), who reported that excessive inbreeding negatively affects research productivity and institutional innovation.

Comparatively, while moderate faculty retention may preserve institutional culture and continuity, excessive dependence on internally trained staff limits exposure to global practices and emerging technologies. Amini-Philips and Harrison (2021) noted that faculty inbreeding may support institutional traditions but may also reduce academic competitiveness and innovation when poorly managed.

The findings further revealed that faculty inbreeding does not encourage external exposure and industrial experience which significantly impedes practical learning and curriculum modernization. This is in line with Orie et al. (2025) who found that unskilled and technologically inexperienced personnel negatively affect digital laboratory effectiveness and practical learning outcomes. The implication is that institutions must prioritize recruitment diversity, professional development, industrial attachment, and international collaboration to improve practical competence and employability among graduates.

Conclusion

The study concluded that excessive faculty inbreeding negatively affects instructional quality, curriculum modernization, innovation, industrial collaboration, and practical skills acquisition in Tertiary institutions in Nigeria. Faculty diversity, industrial exposure, academic mobility, and transparent recruitment practices significantly improve instructional effectiveness and skills training programmes.

Recommendations

1. Tertiary institutions should adopt transparent and merit-based recruitment policies to reduce excessive faculty inbreeding.
2. Academic staff should participate in staff exchange programmes, international collaborations, and industrial attachment programmes.
3. Government should increase funding for staff development, digital technologies, and innovation-driven instructional systems.
4. Institutions should strengthen school-industry partnerships to improve practical learning and industrial exposure.
5. Curriculum modernization and recruitment diversity should be prioritized to improve graduates' employability and workforce readiness.

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