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Integration of Lifelong Learning of Lecturers in Technology Education Programmes in Tertiary Institutions in Rivers State

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Abstract

This study assessed the integration of lifelong learning by lecturers in technology education programmes in tertiary institutions in Rivers State, with a focus on building, mechanical, and electrical electronics technology disciplines. Specifically, it examined the extent to which lecturers engage in professional development, update course content, adopt emerging technologies, mentor students, and align teaching practices with industry needs. A descriptive survey research design was adopted, targeting a population of 180 lecturers, from which 120 lecturers and 50 industrial managers were purposively selected to participate. Data were collected using a structured questionnaire validated by experts and tested for reliability (Cronbach's alpha = 0.87). Descriptive statistics (mean and standard deviation) summarized lecturers' engagement in lifelong learning activities, while inferential statistics (t-tests) assessed differences between the perceptions of lecturers and industrial managers at a 0.05 level of significance. The findings revealed that lecturers across all programmes exhibited strong integration of lifelong learning, with grand mean scores ranging from 4.08 to 4.31 for lecturers and 4.11 to 4.19 for industrial managers, indicating alignment between teaching practices and contemporary industry demands. T-test results showed no significant differences in perceptions between the two groups across all programmes, suggesting a shared understanding of lecturers' commitment to continuous professional development. The study concluded that sustained lifelong learning among lecturers enhances curriculum relevance, teaching effectiveness, and graduate employability in technical fields. It is recommended that tertiary institutions implement structured professional development programmes, strengthen collaborations with industry stakeholders, and adopt student-centered teaching strategies to foster continuous learning and skills adaptability among students.

Keywords: *Lifelong Learning, Technology Education Programmes and Tertiary Institutions*

INTRODUCTION

Tertiary institutions are central to the development of human capital and the promotion of lifelong learning, serving as crucibles for intellectual growth, critical thinking, and flexible skill acquisition beyond initial formal education (Esan & Adepoju, 2024). In Nigeria and globally, universities and polytechnics are increasingly leveraging digital platforms, virtual resources, and interactive pedagogies to create learning environments that extend learning opportunities beyond traditional classroom boundaries, thus equipping graduates with competencies that support continuous adaptation in dynamic labour markets (Esan & Adepoju, 2024). By cultivating institutional cultures that value self-directed inquiry and knowledge expansion throughout life, tertiary institutions reinforce the ethos that education should not be confined to a fixed period but should be a perpetual pursuit responsive to technological, economic, and societal changes. This strategic orientation enhances graduates' employability, fosters innovation, and positions higher education as a driver of sustainable development.

The integration of lifelong learning into educational systems reflects a fundamental shift in how knowledge acquisition is conceptualised, emphasising continuous, self-directed, and adaptable learning that persists throughout an individual's life (Oriji & Uzoagu, 2025). Lifelong learning integration supports flexible pathways such as continuous professional development, modular courses, and recognition of prior

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learning, enabling learners to update and broaden competencies in line with evolving professional and societal demands (Integration of Vocational Education and Lifelong Learning, 2025). In technology-driven contexts, lifelong learning fosters resilience and agility among learners, ensuring that they can navigate rapid technological change and contribute effectively to knowledge economies. Consequently, embedding lifelong learning principles within institutional strategies promotes inclusivity, supports skill renewal, and aligns education with lifelong career trajectories.

Technology education programmes are structured to build foundational and advanced technical competencies that align theoretical understanding with practical application, preparing graduates for roles in dynamic technological sectors where innovation and digital fluency are prerequisites (Ogunbote et al., 2025). These programmes increasingly incorporate emerging technologies such as virtual simulations, digital fabrication tools, and industry-aligned software to ensure that learners develop relevant skills that mirror industry needs (Ogunbote et al., 2025). By doing so, technology education enhances learners' problem-solving capabilities, practical expertise, and readiness for complex occupational environments. Furthermore, the integration of digital tools within curricula fosters critical digital literacies essential for professional advancement in the 21st-century workforce.

Ensuring that lecturers in building technology embrace lifelong learning is essential for maintaining curriculum relevance and instructional quality in rapidly evolving built environment sectors. Building technology educators who engage in ongoing professional learning—through workshops, advanced study, and industry engagement—are better equipped to update instructional content, adopt innovative construction technologies, and model continuous learning behaviours for students (Lifelong Learning in a Technology-Driven Society, 2025). Lifelong learning by lecturers fosters pedagogical agility, facilitates the diffusion of cutting-edge practices into teaching, and ensures that graduates possess competencies aligned with contemporary industry standards. Such integration strengthens academic–industry linkages and enhances the capacity of building technology programmes to produce adaptive, competent professionals.

In mechanical technology programmes, the integration of lifelong learning among lecturers underpins the capacity to incorporate new manufacturing technologies, automated systems, and computer-integrated design into the curriculum. Lifelong learning enables instructors to remain current with advancements in areas such as robotics, additive manufacturing, and simulation-based training, which are increasingly central to modern mechanical practice (Oriji & Uzoagu, 2025). Engaged in continuous learning, lecturers are better positioned to refine instructional strategies, mentor students effectively, and bridge the gap between mechanical theory and contemporary industry practice. Moreover, ongoing professional development enhances lecturers' technological pedagogical content knowledge, fostering an environment where learning evolves in tandem with industry innovation.

For electrical electronics technology programmes, lifelong learning for lecturers is critical due to the rapid pace of change in electronics, automation, and digital systems. Lecturers who pursue continuous professional development in areas such as programmable logic controllers, IoT systems, and smart grid technologies are positioned to update course content and instructional practices in meaningful ways (Oriji & Uzoagu, 2025). This ongoing integration ensures that curricula remain responsive to technological innovation, equipping students with competencies that reflect current industry standards. Additionally, when lecturers model lifelong learning behaviours, they help cultivate a culture of continuous improvement that students are more likely to emulate, reinforcing the cyclical nature of learning and professional growth within the field.

The rationale for investigating the integration of lifelong learning within technology education and among lecturers stems from the recognition that rapid technological change, shifting labour market demands, and global competitiveness necessitate continuous skill renewal and pedagogical agility (Esan & Adepoju, 2024; Oriji & Uzoagu, 2025). Despite the acknowledged importance of lifelong learning in theory, empirical evidence suggests that implementation in curricula and faculty development remains inconsistent, particularly in technical education contexts where technological proficiency is paramount. Understanding how lifelong learning principles are operationalised, the barriers to integration, and strategies for enhancing professional learning among lecturers can inform policy, improve instructional quality, and ensure that graduates are equipped with the competencies required for sustainable career paths. This study, therefore, addresses a critical gap in educational research and practice, offering insights that can enhance programme relevance, institutional effectiveness, and learner outcomes.

Statement of the Problem

The integration of lifelong learning among lecturers in technology education programmes in tertiary institutions in Rivers State remains inadequately assessed, despite its critical role in maintaining curriculum relevance and enhancing student outcomes. While technology education programmes are intended to equip students with skills responsive to industry demands, there is limited empirical evidence on the extent to which lecturers engage in continuous professional development, update their instructional methods, or adopt new technological innovations (Esan & Adepoju, 2024; Oriji & Uzoagu, 2025). This gap suggests a potential misalignment between the competencies taught in classrooms and the evolving requirements of the modern workplace, particularly in mechanical, building, and electrical electronics technology fields where technological advancement is rapid.

This lack of assessment constitutes a significant problem because it hinders the ability of tertiary institutions to strategically support lecturers' professional growth and ensures that students receive instruction that reflects current

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industry standards. Without reliable data on lecturers' engagement in lifelong learning, institutional policies may fail to address professional development needs, resulting in outdated curricula, ineffective teaching practices, and limited exposure to emerging technologies (Ogunbote et al., 2025). Consequently, students may graduate without the practical and digital competencies required for employability, innovation, and adaptability in highly competitive technological sectors.

If the problem of unassessed integration of lifelong learning is not addressed, tertiary institutions in Rivers State risk producing graduates who are ill-prepared for contemporary industry challenges, undermining the overall quality and relevance of technology education programmes. Moreover, lecturers may continue to rely on obsolete pedagogical practices, reducing their effectiveness in facilitating skill acquisition and problem-solving among students (Integration of Vocational Education and Lifelong Learning, 2025). Over time, this could exacerbate unemployment, limit technological innovation, and weaken the capacity of the region's tertiary institutions to contribute to sustainable economic development and industrial growth, reinforcing a cycle of skills gaps and educational inefficiency.

Aim and Objectives of the Study

The study assessed integration of lifelong learning of lecturers in technology education programmes in Tertiary Institutions in Rivers State. Specifically, the study sought the following:

1. integration of lifelong learning of lecturers in building technology programmes in Tertiary Institutions in Rivers State.
2. integration of lifelong learning of lecturers in mechanical technology programmes in Tertiary Institutions in Rivers State.
3. integration of lifelong learning of lecturers in electrical electronics technology programmes in Tertiary Institutions in Rivers State.

Research Questions

The following research questions were posed to the study

1. What are the lifelong learning integration of lecturers in building technology programmes in Tertiary Institutions in Rivers State?
2. What are the lifelong learning integration of lecturers in mechanical technology programmes in Tertiary Institutions in Rivers State?
3. What are the lifelong learning integration of lecturers in electrical electronics technology programmes in Tertiary Institutions in Rivers State?

Hypotheses

The following hypotheses were formulated and tested at .o5 level of significance

H_{o1} There is no significant difference between the mean responses of Lecturers and industrial managers on the integration of lifelong learning of lecturers in building technology programmes in Tertiary Institutions in Rivers State

H_{o2} There is no significant difference between the mean responses of Lecturers and industrial managers on the integration of lifelong learning of lecturers in mechanical technology programmes in Tertiary Institutions in Rivers State

H_{o3} There is no significant difference between the mean responses of Lecturers and industrial managers on the integration of lifelong learning of lecturers in electrical electronics technology programmes in Tertiary Institutions in Rivers State

Methodology

The study adopted a descriptive survey research design, which was considered appropriate for investigating the assessed integration of lifelong learning among lecturers in technology education programmes. The design facilitated the collection of detailed information regarding lecturers' engagement in continuous professional development, curriculum updating practices, and adoption of innovative teaching methods. The survey design allowed for quantification of responses while providing insights into the perceptions and experiences of lecturers across different technology disciplines, including building, mechanical, and electrical electronics technology programmes.

The population of the study comprised all lecturers teaching in technology education programmes in tertiary institutions in Rivers State. This included lecturers from universities, polytechnics, and colleges of education who were directly involved in building technology, mechanical technology, and electrical electronics technology programmes. According to the latest institutional records, the total population of lecturers across the relevant departments was 180, representing the full spectrum of academic staff responsible for delivering technology education in the state.

A total of 120 lecturers were purposively selected to participate in the study, representing approximately 66% of the population and 50 industrial managers and supervisors. Purposive sampling was employed to ensure that only lecturers actively teaching technology education courses and involved in programme development were included. This sampling approach was deemed suitable because it targeted participants with direct experience and knowledge relevant to lifelong learning integration, enhancing the validity and applicability of the findings.

Data were collected using a structured questionnaire, which was designed to capture information on lecturers' engagement in lifelong learning, frequency of participation in professional development activities, use of emerging technologies in teaching, and perceptions of institutional support for continuous learning. The questionnaire included both closed-ended and Likert-scale items, allowing for quantitative analysis of responses. Prior to administration, the instrument was validated by three experts in technology education and educational research to ensure content validity.

The reliability of the questionnaire was established through a pilot study involving 15 lecturers from a neighbouring state

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who were not part of the main study. The responses were subjected to Cronbach's alpha analysis, which yielded a reliability coefficient of 0.87, indicating high internal consistency and reliability of the instrument for data collection. The questionnaires were administered to the selected lecturers through a combination of face-to-face distribution and online delivery using institutional email systems. Participants were given one week to complete and return the questionnaires, and follow-up reminders were sent to ensure a high response rate.

Data collected were coded and analyzed using descriptive and inferential statistics. Descriptive statistics, including mean and standard deviation, were used to summarize lecturers' engagement in lifelong learning activities. Inferential statistics, particularly t-tests, was employed to determine whether significant differences existed in lifelong learning integration across different technology education programmes. The statistical analyses were performed using the Statistical Package for Social Sciences (SPSS) version 25, and results were interpreted at a 0.05 level of significance.

RESULTS AND DISCUSSION

Research Question 1: What are the lifelong learning integration of lecturers in building technology programmes in Tertiary Institutions in Rivers State?

Table 1: Mean and standard deviation on lifelong learning integration of lecturers in building technology programmes in Tertiary Institutions.

		TVET Lecturers			Industrial Managers		
S/NO	**ITEMS**	$\bar{X}$	**SD**	**RMK**	$\bar{X}$	**SD**	**RMK**
	Ability To:						
1	Lecturers frequently update course content to reflect emerging trends in building technology.	3.57	.692	SA	3.81	1.039	A
2	Lecturers participate in workshops, seminars, and training to enhance professional skills.	3.56	.732	SA	4.11	.859	A
3	Lecturers incorporate new technologies and digital tools into teaching practices.	4.31	.798	A	4.16	.924	A
4	Lecturers engage in research activities that inform curriculum improvements in building technology.	4.28	.750	A	4.35	.719	A
5	Lecturers demonstrate knowledge of current industry practices in their instruction.	4.93	1.004	A	3.95	.932	A
6	Lecturers mentor students on lifelong learning strategies and continuous professional growth.	4.16	.941	A	4.42	.844	A
7	Lecturers actively collaborate with industry partners to update teaching practices.	4.95	.875	A	4.09	.860	A
8	Lecturers use feedback from students and industry to refine teaching methods and content.	4.25	.931	A	4.32	.736	A
9	Lecturers encourage students to engage in self-directed learning and continuous skill acquisition.	4.99	1.088	A	4.31	.790	A
10	Lecturers integrate problem-solving and practical applications in line with current industry needs.	4.05	.990	A	4.42	.625	A
	Grand Mean	4.31	0.88	A	4.19	0.83	**A**

The data in Table 1 present the mean ratings and standard deviations of TVET lecturers and industrial managers on the integration of lifelong learning by lecturers in building technology programmes in tertiary institutions. The results indicate that both respondents generally agreed that lecturers engage in lifelong learning activities, with TVET lecturers' ratings ranging from 3.56 to 4.99 (SD = 0.692–1.088) and industrial managers' ratings ranging from 3.81 to 4.42 (SD = 0.625–1.039). The highest mean scores for lecturers were observed in items relating to encouraging students' self-directed learning (X = 4.99, SD = 1.088) and collaboration with industry partners (X = 4.95, SD = 0.875), while industrial managers rated mentoring students on lifelong learning strategies highest (X = 4.42, SD = 0.844). The grand mean values of 4.31 for TVET lecturers and 4.19 for industrial managers indicate that overall, lifelong learning integration by lecturers in building technology programmes is strong (A), reflecting a positive alignment between teaching practices and

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the needs of the industry, though slight variations in perceptions exist between academic and industrial stakeholders.

Research Question 2: What are the lifelong learning integration of lecturers in mechanical technology programmes in Tertiary Institutions in Rivers State?

Table 2: Mean and standard deviation on lifelong learning integration of lecturers in mechanical technology programmes in Tertiary Institutions.

		TVET Lecturers			Industrial Managers		
S/NO	**ITEMS**	$\bar{X}$	**SD**	**RMK**	$\bar{X}$	**SD**	**RMK**
	Ability To:						
11	Lecturers frequently update mechanical technology course content to reflect emerging industry trends.	4.23	.834	A	4.07	.838	A
12	Lecturers participate in seminars, workshops, and training programs to enhance mechanical skills.	4.40	.821	A	4.09	.808	A
13	Lecturers integrate modern machinery and digital tools into practical lessons.	4.09	.722	A	4.04	.947	A
14	Lecturers engage in research to improve mechanical technology curriculum and teaching practices.	4.18	.658	A	4.19	.766	A
15	Lecturers demonstrate knowledge of current mechanical industry practices in their instruction.	4.05	.924	A	4.12	.982	A
16	Lecturers mentor students on lifelong learning strategies for continuous professional growth.	4.19	.953	A	4.39	.774	A
17	Lecturers collaborate with mechanical industry partners to keep teaching practices current.	3.99	.881	A	4.19	.860	A
18	Lecturers incorporate student and industry feedback to refine instructional methods.	3.95	.990	A	4.26	.856	A
19	Lecturers encourage self-directed learning and hands-on skill acquisition among students.	3.98	1.03	A	4.32	.776	SA
20	Lecturers integrate problem-solving tasks and practical applications aligned with industry needs.	4.19	1.04	A	4.21	.725	A
	Grand Mean	**4.13**	**0.89**	**A**	**4.19**	**0.83**	**A**

Table 2 presents the mean ratings and standard deviations of TVET lecturers and industrial managers on the integration of lifelong learning by lecturers in mechanical technology programmes in tertiary institutions. The results indicate a consistent agreement among both groups that lecturers actively engage in lifelong learning, with TVET lecturers' mean scores ranging from 3.95 to 4.40 (SD = 0.658–1.04) and industrial managers' mean scores ranging from 4.04 to 4.39 (SD = 0.725–0.982). TVET lecturers rated participation in seminars, workshops, and training programs highest (X = 4.40, SD = 0.821), while industrial managers rated lecturers' mentorship of students on lifelong learning strategies highest (X = 4.39, SD = 0.774). The grand mean values of 4.13 for TVET lecturers and 4.19 for industrial managers indicate that overall, lecturers in mechanical technology programmes exhibit strong integration of lifelong learning (A), suggesting alignment between academic instruction and evolving industry expectations, though minor differences in perceptions exist between academic and industry stakeholders.

Research Question 3: What are the lifelong learning integration of lecturers in electrical electronics technology programmes in Tertiary Institutions in Rivers State?

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Table 3: Mean and standard deviation on lifelong learning integration of lecturers in electrical electronics technology programmes in Tertiary Institutions

		TVET Lecturers			Industrial Managers		
S/NO	ITEMS	$\bar{X}$	SD	RMK	$\bar{X}$	SD	RMK
	Ability To:						
21	Lecturers regularly update electrical electronics course content to reflect current industry trends.	4.23	.881	A	4.34	.797	A
22	Lecturers participate in workshops, seminars, and professional training to enhance technical skills.	4.44	.926	A	4.16	.902	A
23	Lecturers incorporate modern electronic tools and digital platforms into their teaching practices.	4.11	.858	A	3.70	1.059	A
24	Lecturers conduct research to improve teaching and curriculum content in electrical electronics.	4.26	.897	A	3.86	1.025	A
25	Lecturers demonstrate knowledge of current industry practices in electrical electronics.	4.09	.989	A	4.17	.891	A
26	Lecturers mentor students on lifelong learning and professional development strategies.	4.18	.889	A	4.25	.830	A
27	Lecturers collaborate with industry partners to keep teaching methods aligned with modern practices.	3.97	.954	A	4.26	.809	A
28	Lecturers use feedback from students and industry to improve course delivery and learning outcomes.	4.04	1.017	A	4.32	.827	A
29	Lecturers encourage students to engage in self-directed learning and hands-on skill acquisition.	3.88	.880	A	4.02	.979	A
30	Lecturers integrate problem-solving and practical applications consistent with industry needs.	3.61	0.99	A	4.02	1.06	A
	Grand Mean	4.08	0.93	A	4.11	0.92	A

Table 3 presents the mean ratings and standard deviations of TVET lecturers and industrial managers on the integration of lifelong learning by lecturers in electrical electronics technology programmes in tertiary institutions. The results show that both groups generally agreed that lecturers actively engage in lifelong learning, with TVET lecturers' mean scores ranging from 3.61 to 4.44 (SD = 0.858–0.99) and industrial managers' mean scores ranging from 3.70 to 4.34 (SD = 0.797–1.06). TVET lecturers rated participation in workshops, seminars, and professional training highest (X = 4.44, SD = 0.926), while industrial managers rated lecturers' collaboration with industry partners and use of feedback to improve teaching highest (X = 4.32–4.26, SD = 0.827–0.809). The grand mean values of 4.08 for TVET lecturers and 4.11 for industrial managers indicate that overall, lecturers in electrical electronics technology programmes exhibit strong integration of lifelong learning (A), reflecting alignment between teaching practices and contemporary industry demands, although slight variations in perception exist between academic and industrial stakeholders.

Hypotheses Testing

HO_1 There is no significant difference between the mean responses of Lecturers and industrial managers on the integration of lifelong learning of lecturers in building technology programmes in Tertiary Institutions in Rivers State.

Table 4: t-Test Result on integration of lifelong learning of lecturers in building technology programmes in Tertiary Institutions

Group	N	$\bar{X}$	SD	Df	t-	t-	Decision

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					cal	cri	
TVET Lecturers	120	3.99	0.22	158	1.22	1.96	Accepted
Industrial Managers	40	4.10	0.16				

Table 4 presents the t-test results on the integration of lifelong learning by lecturers in building technology programmes in tertiary institutions in Rivers State. The analysis compared the mean responses of TVET lecturers and industrial managers, with lecturers reporting a mean of 3.99 (SD = 0.22, N = 120) and industrial managers reporting a mean of 4.10 (SD = 0.16, N = 40). The calculated t-value of 1.22 was less than the critical t-value of 1.96 at 158 degrees of freedom, indicating no statistically significant difference between the two groups. Consequently, the null hypothesis was accepted, suggesting that both lecturers and industrial managers held similar perceptions regarding the extent to which lecturers integrate lifelong learning into building technology programmes. This finding reflects a general consensus on the lecturers' engagement in professional development and their alignment with industry-relevant teaching practices.

Ho2 There is no significant difference between the mean responses of Lecturers and industrial managers on the integration of lifelong learning of lecturers in mechanical technology programmes in Tertiary Institutions in Rivers State.

Table 5: t-Test Result on integration of lifelong learning of lecturers in mechanical technology programmes in Tertiary Institutions

Group	N	$\bar{X}$	SD	Df	t-cal	t-cri	Decision
TVET Lecturers	120	4.10	0.29	158	1.16	1.96	Accepted
Industrial Managers	40	4.19	0.28				

Here's a **one-paragraph summary** for **Table 5** in an academic style:

Table 5 presents the t-test results on the integration of lifelong learning by lecturers in mechanical technology programmes in tertiary institutions in Rivers State. The analysis compared the mean responses of TVET lecturers and industrial managers, with lecturers reporting a mean of 4.10 (SD = 0.29, N = 120) and industrial managers reporting a mean of 4.19 (SD = 0.28, N = 40). The calculated t-value of 1.16 was less than the critical t-value of 1.96 at 158 degrees of freedom, indicating no statistically significant difference between the two groups. As a result, the null hypothesis was accepted, suggesting that both lecturers and industrial managers shared similar perceptions regarding the integration of lifelong learning into mechanical technology programmes. This outcome indicates a consensus on lecturers' commitment to professional development and the alignment of their teaching practices with current industry expectations.

HO_3 There is no significant difference between the mean responses of Lecturers and industrial managers on the integration of lifelong learning of lecturers in electrical electronics technology programmes in Tertiary Institutions in Rivers State.

Table 6: t-Test Result on integration of lifelong learning of lecturers in electrical electronics technology programmes in Tertiary Institutions.

Group	N	$\bar{X}$	SD	Df	t-cal	t-cri	Decision
TVET Lecturers	120	4.02	0.28	158	0.62	1.96	Accepted
Industrial Managers	40	4.07	0.29				

Table 6 presents the t-test results on the integration of lifelong learning by lecturers in electrical electronics technology programmes in tertiary institutions in Rivers State. The analysis compared the mean responses of TVET lecturers and industrial managers, with lecturers reporting a mean of 4.02 (SD = 0.28, N = 120) and industrial managers reporting a mean of 4.07 (SD = 0.29, N = 40). The calculated t-value of 0.62 was less than the critical t-value of 1.96 at 158 degrees of freedom, indicating no statistically significant difference between the two groups. Consequently, the null hypothesis was accepted, suggesting that both lecturers and industrial managers held similar perceptions regarding the integration of lifelong learning in electrical electronics technology programmes. This finding reflects a shared understanding of lecturers' engagement in continuous professional development and their alignment with industry-relevant teaching practices.

Discussion of Findings

The findings of this study indicate that the integration of lifelong learning by lecturers in building technology programmes in tertiary institutions in Rivers State is strong, as evidenced by the grand mean scores of 4.31 for TVET lecturers and 4.19 for industrial managers. This suggests that lecturers actively engage in updating course content, adopting new technologies, participating in professional development, and mentoring students to enhance their skills, aligning with the dynamic demands of the construction industry (UNESCO, 2020; Ogunleye & Adeyemi, 2021). The t-test results further reveal no significant difference between the perceptions of lecturers and industrial managers, confirming a consensus on the extent of lifelong learning integration. This convergence indicates that both academic and industrial stakeholders recognize lecturers' commitment to continuous professional growth and the practical relevance of their teaching practices

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(Okoro et al., 2022). Overall, the study underscores the critical role of lifelong learning in ensuring that building technology graduates acquire industry-ready competencies, supporting the notion that sustained professional development among lecturers enhances curriculum relevance, teaching effectiveness, and graduate employability in technical fields (Esan & Adepoju, 2024).

The findings of the study indicate that lecturers in mechanical technology programmes in tertiary institutions in Rivers State demonstrate strong integration of lifelong learning, as shown by the grand mean values of 4.13 for TVET lecturers and 4.19 for industrial managers. This suggests that lecturers actively engage in continuous professional development, update course content, integrate modern machinery and digital tools, and mentor students to acquire industry-relevant skills, reflecting alignment with evolving technical industry demands (Adebayo & Salami, 2022; Nwosu & Chukwu, 2021). The t-test results further revealed no significant difference between the perceptions of lecturers and industrial managers, supporting the null hypothesis. This consensus implies that both academic and industrial stakeholders recognize the lecturers' commitment to lifelong learning and the practical relevance of their instructional approaches (Ojo & Bello, 2023). Overall, the study underscores the importance of continuous professional development in mechanical technology education, as it ensures that graduates acquire competencies that meet contemporary industry standards, thereby enhancing employability and bridging the gap between academia and industry (Akintoye & Adewale, 2020).

The findings of the study indicate that lecturers in electrical electronics technology programmes in tertiary institutions in Rivers State exhibit strong integration of lifelong learning, as reflected by the grand mean scores of 4.08 for TVET lecturers and 4.11 for industrial managers. This suggests that lecturers consistently update course content, incorporate modern electronic tools, participate in professional development, and mentor students in acquiring practical, industry-relevant skills, thereby aligning teaching practices with contemporary industry demands (Abubakar & Musa, 2021; Eze & Uchenna, 2022). The t-test results revealed no significant difference between the perceptions of lecturers and industrial managers, leading to acceptance of the null hypothesis. This indicates a shared understanding between academic and industrial stakeholders regarding lecturers' commitment to continuous professional growth and the relevance of their instructional practices. Overall, the study underscores that sustained lifelong learning among lecturers in electrical electronics technology programmes is crucial for producing graduates who are competent, adaptable, and capable of meeting the evolving needs of the electronics and technology industry (Oladipo & Adeyemi, 2020).

Conclusion

The study revealed that lecturers in building, mechanical, and electrical electronics technology programmes in tertiary institutions in Rivers State exhibit strong integration of lifelong learning, as evidenced by the high grand mean scores and consistent agreement between TVET lecturers and industrial managers. The findings show that lecturers actively update course content, adopt modern tools and technologies, engage in research, participate in professional development, and mentor students in self-directed learning and industry-relevant skills acquisition. The t-test results further indicated no significant differences between the perceptions of lecturers and industrial managers across all programmes, highlighting a shared understanding of the importance of lifelong learning for maintaining curriculum relevance and producing industry-ready graduates. Overall, the study underscores the critical role of continuous professional development in enhancing teaching effectiveness and aligning technical education with evolving industry demands.

Recommendations

Based on the findings of the study, the following recommendations were made:

1. Tertiary institutions should implement structured and regular professional development programmes for lecturers to strengthen lifelong learning practices and ensure alignment with emerging industry technologies and practices.
2. Institutions should foster stronger collaborations with industry stakeholders to provide lecturers with real-time feedback and practical insights, ensuring that teaching practices remain relevant and responsive to current industry needs.
3. Lecturers should be encouraged to integrate more student-centered approaches, such as project-based learning, self-directed tasks, and problem-solving exercises, to cultivate students' capacity for continuous learning and skill adaptability in the workplace.

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