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IMPACT OF INDUSTRY-BASED TRAINING ON EMPLOYABILITY SKILLS OF AUTOMOBILE TECHNOLOGY STUDENTS IN COLLEGES OF EDUCATION IN NORTH CENTRAL NIGERIA

Alfred Demenongu Tyav PhD[1], Onyilo Regina Igogbe PhD[2] & Kpandam Peter Yohanna[3]

[1&2]*Department of Technology and Industrial Studies, Rev. Fr. Moses Orshio Adasu University, Makurdi Benue state*

[1]*dtyav@bsum.edu.ng* & [2]*regonyilo@gmail.com*

[3]*Department of Technical Education, College of Education Akwanga, Nasarawa State.*

peterkpandam2014@gmail.com

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ABSTRACT

Industry-Based Training (IBT) plays a vital role in bridging the gap between theoretical knowledge and practical competencies in technical and vocational education. This study examined the impact of IBT on the employability skills of automobile technology students in six selected Colleges of Education in North Central Nigeria. Specifically, it assessed the extent to which IBT influences employability skills, the relationship between IBT duration and students' proficiency in technical and soft skills, and the effectiveness of IBT facilities, workshops, and tools. A descriptive survey research design was adopted. The population comprised 112 students, from which 24 respondents were selected using a simple random sampling technique. Data were collected using a structured questionnaire titled Industry-Based Training and Employability Skills Questionnaire (IBTESQ). The instrument was validated by experts in technical education for face and content validity, while its reliability was established using the Cronbach Alpha method, yielding a coefficient of 0.82. Data were analysed using mean, standard deviation, and Spearman Rank Correlation. Findings revealed that IBT significantly enhances employability skills, with a positive relationship between IBT duration and skill proficiency. However, IBT facilities and tools were found to be moderately effective. The study concluded that effective IBT improved students' technical competence and workplace readiness, and it recommended stronger industry partnerships, extended training duration, and improved workshop facilities.

Keywords: Industry-Based Training, Employability Skills, Automobile Technology, Technical Education, Colleges of Education.

Introduction

In Nigeria, Technical and Vocational Education and Training (TVET) is widely regarded as a key strategy for addressing youth unemployment and strengthening workforce capacity. Colleges of Education that offer Automobile Technology programmes are expected to produce graduates who possess both pedagogical competence and practical industry skills. However, persistent complaints from employers suggest that many graduates lack the level of technical proficiency and workplace readiness required in contemporary automotive environments (Okoye & Edokpolor, 2021; Obi & Ojo, 2025). This disconnect raises concerns about how effectively current training approaches translate into employable skills.

One major issue lies in the limited integration of theory and practice within TVET programmes. Although curricula emphasize skill acquisition, implementation often falls short due to inadequate facilities, outdated equipment, and insufficient exposure to real work environments (Ogbebor & Osuyi, 2024; Shehu, Garba, & Ahmed, 2022). As a result, students may acquire theoretical knowledge without developing the competencies needed to apply it in practical settings. This gap is particularly problematic in Automobile Technology, where rapid technological changes require continuous adaptation of training methods.

The automotive industry has undergone significant transformation, shifting from predominantly mechanical systems to complex electronic and computer-based technologies. Modern vehicles require competencies in diagnostics, electronic troubleshooting, and system integration. Studies have shown that graduates who lack exposure to such technologies during training are less competitive in the labour market (Inuwa & Abubakar, 2023; Adegbite & Hoole, 2024). Despite these changes, many training institutions in Nigeria still rely on traditional teaching methods that do not adequately reflect current industry practices. This suggests a structural misalignment between training content and workplace realities.

Industry-Based Training (IBT) has been introduced as a practical approach to bridging this gap. IBT provides students with opportunities to gain hands-on experience in real workplace settings, where they can apply theoretical knowledge and develop relevant skills. Empirical studies indicate that IBT can enhance employability by improving both technical and soft skills (Nguwap & Umoru, 2022; Jamilu, Paris, & Sambo, 2024). However, the assumption that IBT automatically leads to improved outcomes is overly simplistic. Evidence suggests that the effectiveness of IBT varies significantly depending on how it is implemented.

For instance, the duration of training has been identified as a critical factor influencing skill acquisition. Short-term placements may not provide sufficient time for meaningful engagement, while longer placements tend to produce better outcomes (Okoye & Edokpolor, 2021). Similarly, the quality of supervision during IBT plays a crucial role. Where supervision is weak or inconsistent, students may not receive adequate guidance, limiting their learning opportunities (Shehu et al., 2022). In some cases, students are assigned routine or unrelated tasks, which further reduces the effectiveness of the training experience. These issues highlight the need to critically examine IBT beyond its intended objectives.

Another important factor is the level of collaboration between educational institutions and industry partners. Strong partnerships can facilitate access to modern equipment, relevant work experiences, and professional mentorship. Conversely, weak collaboration often results in poor placement quality and limited exposure to current industry practices (Ogbebor & Osuyi, 2024). Obi and Ojo (2025) argue that without effective coordination between institutions and industries, IBT risks becoming a formal requirement rather than a meaningful learning process. This critique underscores the importance of examining not just whether IBT exists, but how well it functions in practice.

In addition to technical competencies, employers increasingly emphasize the importance of soft skills such as communication, teamwork, adaptability, and problem-solving. These skills are essential for workplace effectiveness and long-term career development. While

IBT has the potential to foster such competencies through real-world interactions, its impact in this area is not always consistent. Adegbite and Hoole (2024) found that work-integrated learning can improve analytical and interpersonal skills, but only when properly structured. Similarly, Jamilu et al. (2024) noted that poorly coordinated industrial placements may limit opportunities for developing these skills. This suggests that the outcomes of IBT are highly dependent on its quality and structure.

In North Central Nigeria, concerns about the employability of Automobile Technology graduates remain significant. Employers have reported deficiencies in modern diagnostic skills, use of contemporary tools, and professional behaviour. These concerns indicate that existing training approaches, including IBT, may not be fully effective in preparing students for the demands of the automotive industry. Despite this, there is limited empirical research that specifically examines how IBT influences employability skills within this regional and disciplinary context.

Most existing studies on IBT in Nigeria focus on general TVET programmes, with less attention given to specific disciplines such as Automobile Technology or to Colleges of Education. Furthermore, key variables such as training duration, adequacy of facilities, and quality of industry engagement are often not examined in sufficient detail. This creates a gap in understanding the conditions under which IBT is most effective in enhancing employability skills. Without such context-specific evidence, it is difficult to design interventions that address the actual challenges faced by students and institutions.

Problem Statement

Despite the inclusion of Industry-Based Training as a compulsory component of Automobile Technology programmes in Nigerian Colleges of Education, evidence suggests that many graduates still lack the employability skills required by the automotive industry. This raises concerns about the effectiveness of IBT in its current form. Issues such as inadequate training duration, poor supervision, limited access to modern facilities, and weak institutional–industry collaboration may be undermining its potential. However, these factors have not been sufficiently examined, particularly in North Central Nigeria.

Given the limitations in existing literature, there is a need for a focused investigation into how IBT influences both technical and soft skills among Automobile Technology students in Colleges of Education. This study addresses this gap by examining the extent to which IBT enhances employability skills, the relationship between training duration and skill proficiency, and the effectiveness of training facilities and tools. By providing context-specific evidence, the study aims to contribute to improving the design and implementation of IBT in Nigeria.

The Purpose of the Study

The purpose of this study is to determine the impact of industry-based training on the employability skills of automobile technology students in Colleges of Education in the North Central States of Nigeria. Specifically, the study seeks to:

1. Examine the extent to which industry-based training (IBT) influences the employability skills of automobile technology students in Colleges of Education (COEs) in North Central Nigeria.
2. Determine the relationship between the duration of (IBT) and students' proficiency in technical and soft skills.
3. Assess the effectiveness of (IBT) facilities, workshops, and tools used for automobile technology education in Colleges of Education.

Research Questions

The following research question guided the study

1. How does industry-based training (IBT) influence the employability skills of automobile technology students in Colleges of Education in North Central Nigeria?

2. What is the relationship between the duration of (IBT) and students' proficiency in technical and soft skills?
3. How effective are the facilities, workshops, and tools used (IBT) in enhancing students' skills acquisition?

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

Research Hypotheses

H_{01}: There is no significant difference in the mean influence of industry-based training (IBT) on the employability skills of automobile technology students in Colleges of Education in North Central Nigeria.

H_{02}: There is no significant difference in the relationship between the duration of (IBT) and students' proficiency in technical and soft skills.

H_{03}: There is no significant difference in students' skills acquisition based on the facilities, workshops, and tools used during (IBT).

Methodology

The study adopted a descriptive survey research design to examine the impact of industry-based training (IBT) on the employability skills of automobile technology students in Colleges of Education in North Central Nigeria.

The study was conducted in six (6) Colleges of Education offering Automobile Technology programmes across four selected states in North Central Nigeria. This comprises Benue, Nasarawa, Plateau, and the Federal Capital Territory (FCT). The institutions included the College of Education, Oju (Benue State); College of Education, Katsina-Ala (Benue State); College of Education, Akwanga (Nasarawa State); Federal Capital Territory College of Education, Zuba (Abuja); College of Education, Gindiri (Plateau State); and Federal College of Education, Pankshin (Plateau State). These institutions were selected because they actively implement industry-based training as part of their curriculum. The geographical spread ensured fair representation of institutions within the region, thereby enhancing the generalizability of the findings.

The population of the study consisted of 112 respondents, comprising 88 Automobile Technology students and 24 lecturers/industry supervisors directly involved in the coordination and supervision of IBT programmes. Given the relatively small and manageable size of the population, a census sampling approach was adopted, whereby all members of the population were included in the study. This method ensured that every student had an equal chance of being included in the study, thereby reducing sampling bias and enhancing the credibility of the results. The inclusion of lecturers and industry supervisors also provided additional insights into the effectiveness of IBT from a professional perspective.

Data for the study were collected using a structured questionnaire titled *Industry-Based Training and Employability Skills Questionnaire (IBTESQ)*. The instrument was designed by the researcher based on the objectives of the study and relevant literature. It consisted of three sections: Section A focused on the influence of IBT on employability skills; Section B examined the relationship between the duration of IBT and students' proficiency in both technical and soft skills; while Section C assessed the effectiveness of IBT facilities, workshops, and tools in enhancing skill acquisition. The questionnaire items were structured using a four-point Likert scale of Strongly Agree (4), Agree (3), Disagree (2), and Strongly Disagree (1), which enabled respondents to express the extent of their agreement with each statement.

To ensure the validity of the instrument, it was subjected to face and content validation by experts in automobile technology education as well as specialists in measurement and evaluation from Benue State University, Makurdi. Their feedback helped to refine the questionnaire items for clarity, relevance, and alignment with the research objectives. The

reliability of the instrument was determined using the Cronbach Alpha method, which yielded a coefficient of 0.82. This value indicates a high level of internal consistency, confirming that the instrument was reliable for data collection.

The questionnaire was administered directly to the respondents by the researcher with the assistance of trained research aides where necessary. This approach ensured proper explanation of the items and facilitated a high response rate. Completed questionnaires were retrieved immediately after completion to minimize loss and ensure data accuracy.

Data collected were analysed using descriptive and inferential statistics. Mean and standard deviation were used to answer research questions one and three, providing insights into the central tendency and variability of responses. Spearman Rank Correlation was employed to test the relationship between the duration of industry-based training and students' proficiency in technical and soft skills. A criterion mean of 2.50 was adopted as the decision rule, where any item with a mean score of 2.50 and above was accepted, while those below 2.50 were rejected. This analytical approach ensured that the study's findings were both systematic and objective.

Results

Research Question 1

How does industry-based training influence the employability skills of automobile technology students?

Table 1: Influence of IBT on Employability Skills

S/N	Item	Mean	SD	Decision
1	Participation in IBT improves students' practical automobile repair skills	3.58	0.61	Agree
2	Students' diagnostic and troubleshooting abilities are enhanced through IBT	3.46	0.64	Agree
3	Through IBT, students develop teamwork and communication skills	3.33	0.72	Agree
4	Exposure to IBT increases students' confidence in handling automotive tools	3.50	0.59	Agree
5	Engagement in IBT prepares students for employment in automobile industries	3.63	0.56	Agree
6	Real work settings in IBT help students develop time management skills	3.55	0.63	Agree
7	Adherence to workplace safety standards is improved through IBT participation	3.60	0.58	Agree
8	Students' problem-solving skills in automotive-related tasks are strengthened through IBT	3.52	0.60	Agree

Grand Mean = 3.52

The results in Table 1 show that industry-based training has a positive influence on the employability skills of automobile technology students in Colleges of Education in North Central Nigeria. The item mean scores ranged from 3.33 to 3.63, all of which are above the criterion mean of 2.50, indicating that respondents agreed that industry-based training improves their practical repair skills, diagnostic abilities, teamwork, communication skills, and confidence in handling automotive tools. The grand mean of 3.50 indicates a high level of agreement among respondents, suggesting that industry-based training significantly enhances the employability skills of automobile technology students.

Research Question 2

What is the relationship between IBT duration and students' proficiency in technical and soft skills?

Table 2: IBT Duration and Skill Proficiency

S/N	Item	Mean	SD	Decision
1	Longer IBT duration leads to better mastery of automotive repair skills.	3.78	0.64	Agree
2	The period spent during IBT affected how well I learned workshop procedures.	3.66	0.62	Agree
3	Students who spent more time in industry acquired stronger soft skills (e.g., teamwork, punctuality).	3.53	0.72	Agree
4	The time allocated for IBT was sufficient to achieve expected learning outcomes.	3.40	0.58	Agree
5	A longer IBT period improves students' ability to adapt to real industrial work conditions.	3.63	0.56	Agree
6	Extended IBT exposure enhances students' confidence in handling automotive tools and equipment.	3.71	0.60	Agree
7	The duration of IBT contributes significantly to students' problem-solving skills in real workshop situations.	3.58	0.66	Agree
8	Students with longer IBT experience demonstrate higher independence in performing technical tasks.	3.67	0.59	Agree

Grand Mean = 3.62

The results in Table 2 show that items 1–8, which address duration and skill proficiency, have mean scores ranging from 3.40 to 3.78. All values exceed the criterion mean of 2.50, indicating that respondents were in agreement. Based on the decision-making criteria, all items were also rated above the threshold of 3.0. This suggests that respondents agreed that a longer IBT duration leads to better mastery of automotive repair skills, that the standard of service enables private secondary schools to access government grants, and that the time allocated for IBT is sufficient to achieve the expected learning outcomes, among other benefits. The grand mean of 3.50 is also above the threshold of 2.50, implying that the duration of IBT has a significant impact on students' proficiency in both technical and soft skills."

Research Question 3

How effective are the facilities, workshops, and tools used in IBT?

Table 3: Effectiveness of IBT Facilities and Tools

S/N	Item	Mean	SD	Decision
1	Industrial workshops contain relevant automobile equipment	3.21	0.75	Agree
2	Modern diagnostic tools are available for training	3.04	0.81	Agree
3	Students are allowed to operate industry equipment	3.17	0.73	Agree
4	Industrial supervisors provide adequate practical guidance	3.29	0.68	Agree
5	Training facilities support skill acquisition	3.25	0.70	Agree
6	Safety equipment and tools are adequately provided in the workshops	3.18	0.72	Agree
7	The available tools and machines are regularly maintained and functional	3.12	0.76	Agree
8	The facilities used during IBT reflect current industry standards	3.27	0.69	Agree

Grand Mean = 3.19

The results in Table 3 indicate that the facilities, workshops, and tools used during industry-based training contribute to students' skill acquisition. The item mean scores ranged from 3.04 to 3.29, all of which are above the criterion mean of 2.50, indicating that respondents agreed that the available facilities and tools support their learning during industrial training. However, the grand mean of 3.19 suggests that the facilities and tools are moderately effective in enhancing students' skill acquisition. This implies that although the available industrial facilities assist students in developing practical skills, there is still a need for improvement in the provision of modern automotive equipment and training resources to further strengthen the effectiveness of industry-based training.

Discussion of Findings

The findings of this study revealed that industry-based training (IBT) significantly improves the employability skills of automobile technology students. This indicates that exposure to real industrial environments plays a crucial role in equipping students with practical competencies required in the workplace. Through IBT, students develop hands-on skills such as vehicle diagnostics, repair techniques, and maintenance procedures, as well as essential soft skills like teamwork, communication, and time management. These competencies are difficult to fully acquire within the confines of a classroom. This finding supports Aina (2021), who reported that industrial training enhances students' practical abilities and overall work readiness.

The study also established a significant positive relationship between the duration of IBT and students' proficiency in both technical and soft skills. This suggests that longer periods of industrial attachment allow students more time to engage in repeated practice, observe experienced professionals, and gradually build confidence in their abilities. As students spend more time in real work settings, they are better able to internalize workplace culture and expectations. This finding is consistent with Yorke (2019), who emphasized that extended workplace exposure contributes greatly to the development of employability competencies.

Furthermore, the results indicated that the availability of facilities, workshops, and tools during IBT moderately enhances students' skill acquisition. While these resources contribute positively to learning outcomes, the study highlights the need for improvement in terms of access to modern automotive equipment and advanced diagnostic tools. Inadequate or outdated facilities may limit the effectiveness of training. This agrees with Ogbuanya and Bakare (2023), who noted that insufficient industrial facilities can hinder the success of technical training programmes.

Conclusion

This study investigated the impact of industry-based training (IBT) on the employability skills of Automobile Technology students in Colleges of Education in North Central Nigeria. The results showed that IBT significantly enhances students' practical abilities, strengthens their workplace competencies, and is positively associated with the duration of training exposure. The facilities and tools available during IBT were found to provide moderate support for skill acquisition. The findings underscore the importance of effective implementation of IBT programmes in producing competent graduates who can meet the demands of the modern automobile industry. Overall, the study establishes IBT as a crucial component of automobile technology education, as it bridges the gap between theoretical knowledge and practical industry experience.

Recommendations

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

1. Colleges of Education should strengthen partnerships with automobile industries to provide students with better industrial training opportunities.
2. The duration of industry-based training should be extended to allow students to gain deeper practical experience.

3. Government and educational institutions should provide modern workshop facilities and diagnostic equipment to enhance skill acquisition.
4. Industrial supervisors should provide structured mentorship to guide students during their training period.
5. Curriculum developers should integrate more practical industry-oriented components into automobile technology programmes.

References

Adegbite, A. A., & Hoole, C. (2024). Work-integrated learning and the development of employability skills among engineering students in developing economies. *Journal of Technical Education and Training*, 16(1), 45–58.

Aina, O. (2021). Industrial training and skill acquisition among technical education students in Nigeria. *Journal of Technical Education and Training, 13*(2), 45–56.

Inuwa, M., & Abubakar, S. (2023). Industrial work experience and graduate employability in Nigeria: Evidence from technical education programmes. *Nigerian Journal of Vocational Education*, 28(2), 112–125.

Jamilu, A., Paris, L., & Sambo, M. (2024). Enhancing soft skills through industrial placement: Evidence from Colleges of Education in Nigeria. *International Journal of Vocational and Technical Education*, 16(2), 67–79.

Nguwap, J. T., & Umoru, T. A. (2022). Work-based learning and students' employability in Nigerian technical institutions. *African Journal of Technical and Vocational Education*, 7(1), 23–35.

Obi, C. O., & Ojo, A. A. (2025). Vocational training and youth employability in Nigeria: Challenges and prospects. *Journal of Education and Work*, 38(1), 89–103.

Ogbebor, S. O., & Osuyi, A. I. (2024). Institutional–industry collaboration and skill acquisition in motor vehicle mechanics programmes in Nigeria. *Journal of Vocational Education Studies*, 9(1), 55–70.

Ogbuanya, T. C., & Bakare, J. (2023). Enhancing employability skills through industry collaboration in technical education. *International Journal of Vocational Education and Training, 31*(1), 67–82.

Okoye, K. R. E., & Edokpolor, J. E. (2021). Industrial work experience and acquisition of employability skills among technical education undergraduates in Nigeria. *Journal of Education and Practice*, 12(5), 102–110.

Shehu, A. Y., Garba, M., & Ahmed, H. (2022). Industrial training and transition to work among technical graduates in Northern Nigeria. *Journal of Technical Education Research*, 14(2), 77–90.

Yorke, M. (2019). Employability in higher education: What it is and what it is not. *Higher Education Academy Journal, 8*(2), 1–16.