NAU Journal of Technology and Vocational Education
Volume 11, No. 3, June 2026

EVALUATION OF AUTOMOBILE TRADE INSTRUCTIONAL RESOURCES BASED ON NBTE STANDARDS: AVAILABILITY AND ADEQUACY FOR CURRICULUM DELIVERY IN TECHNICAL COLLEGES IN ANAMBRA STATE

[1]Marycynthia, Chetachukwu Obineche, [2]Lilian-Rita, Ifeoma Akudolu, [3]James, Akal-Karali Obineche & [4]Sabina, Eziamaka Nwana

[1,2,4]Department of Educational Foundations, Nnamdi Azikiwe University, Awka
[3]Department of Industrial Technology Education, Nnamdi Azikiwe University, Awka
[1]mc.obineche@unizik.edu.ng, [2]lr.akudolu@unizik.edu.ng [3]ja.obineche@unizik.edu.ng
[4]se.nwana@unizik.edu.ng
[1]http://orcid .org/0009-0003-0682-721x

Abstract:
The research is geared towards evaluating the availability and adequacy of automobile trade instructional resources for curriculum delivery in technical colleges in Anambra, Nigeria. Specifically, the study provides empirical evidence on the current state of material and physical resources available and their adequacy for curriculum delivery to automobile trade students in both federal and state technical colleges in Anambra State, Nigeria. A descriptive survey research design was adopted for the study. The study was guided by one research question and one corresponding null hypothesis was tested. The target population was 4 technical staff consisted of 2-unit head technical teachers and 2 technicians drawn from 1 federal and 2 state technical colleges that have been officially accredited by National Board for Technical Education (NBTE) to offer Automobile trade programme in Anambra state, Nigeria. A census approach was adopted, hence no sampling procedure. The instrument for data collection was 121 items observational checklist titled "Availability and Adequacy of Instructional Resources for Automobile Trade Curriculum Delivery Questionnaire (AAIRATCDQ)" was adopted for developing the instrument. The study, specifically used National Board for Technical Education (NBTE) minimum standard benchmark is a standardized and officially approved instrument for the accreditation, therefore no further validation and reliability test were administered. Percentage was used to answer the research question while chi-square was used to test the null hypothesis at 0.05 alpha level. The finding revealed that, the instructional resources for curriculum delivery for Automobile trade students in both federal and state technical colleges were inadequately available, hence was below NBTE standard. The study concluded that adequate provision of instructional resources will improve quality of curriculum delivery in technical colleges. Based on the finding, it was recommended that Federal and State government should as a matter of urgency increase budgetary allocation towards reviving and restoring the place of technical education in Nigeria

Keywords: *Availability, Adequacy, Automobile trade, Instructional resources, technical colleges*

Introduction

Education of the hands is centered in psychomotor domain which underscores the used of manual skills, often referred as doing domain, has been least emphasized, though holds the key to in-born potentials of a learner. This form of education has been proven by literature to had been neglected and degraded, often perceived as education for underprivileged individuals. This perception leads to poor public awareness and minimal investment from stakeholders. Such negligence and stigmatization undermine efforts to harness indigenous talents and build a strong artisan class, resulting in the gradual disappearance of skilled trades rooted in functional education. Overcoming this narrative is essential for repositioning technical colleges as hubs of innovation, growth and national development. As the world continue to evolve rapidly, the demand for skill driven education increases, as students need to

acquire essential 21st-century skills in order to remain employable, relevant, and productive in the ever-changing demands of world of work, for which technical colleges were established.

Technical college, which underlines hands-on forms of education, is widely seen as a reliable solution to many of Nigeria's socio-economic challenges if wholesomely invested in. According to Federal Republic of Nigeria (FRN, 2013), a technical college is a segment of technical and vocational Education (TVE) designed to produce craftsmen at the secondary school level and master craftsmen at the advanced craft level. As such, technical colleges are regarded as the principal vocational education institutions in Nigeria. The core focus of teaching and learning at this level is practical training, which involves the application of innovative methodologies using science, materials, tools, devices, equipment, machinery, and other resources to enable learners develop competencies for solving practical problems (Eze, 2009). Technical colleges offer a wide range of technical and vocational trades, including building and woodwork, electrical/electronic trades, hospitality, printing (creative arts/design), textiles, agriculture, general education subjects, mechanical, especially automobile trade, which form the focus of this study.

The automobile trade, also referred to as motor vehicle trade, encompasses areas such as auto-electrical works, motor vehicle mechanics, vehicle body building, and auto-parts merchandising, among others. According to National Board for Technical Education (NBTE,2013), the philosophy of the automobile/motor vehicle trade programme is to produce competent craftsmen and technicians capable of contributing meaningfully to Nigeria's technological and industrial development. These craftsmen are expected to test, diagnose, service, and repair faults in conventional vehicles, as well as assemble major units and systems in accordance with manufacturers' specifications.

Furthermore, NBTE (2013) highlights that the automobile trade involves a blend of theoretical knowledge and practical skills aimed at producing goods and services through the effective use of tools, machines, equipment, and materials. With the increasing shift towards automated and computerized systems in modern vehicle, automobile technicians must be equipped with up-to-date technological skills and knowledge to remain relevant and effective. This underlines the importance of adequate provision of physical and material resources in technical colleges where such competencies are developed. In this respect, federal and state government, in collaboration with NBTE, are expected to ensure the availability of modern tools, machines, equipment, and instructional materials necessary for effective training, alongside maintaining quality assurance through proper monitoring and supervision (Eze et al.,2020).

The National Board for Technical Education (NBTE) plays a pivotal role in regulating and guiding technical education in Nigeria. Established on July 11, 1977, by the Nigerian government, NBTE was created in recognition of the critical importance of technical skills and knowledge for national development. According to Odo, et al. (2017), the Board was mandated to develop standardized minimum curricula for technical and vocational education and to facilitate the acquisition of relevant skills and knowledge. In the same stand, Bello et al (2024) affirm that the NBTE Act empowers the Board to set and maintain standards of skills to be attained in technical institutions.

One of the major mechanisms adopted by NBTE to ensure quality is the accreditation scheme. This scheme, which has been fully integrated into the Nigerian educational system, serves as a quality assurance measure to ensure that institutions meet the required standards for effective training. The essence of accreditation is to guarantee that institutions with accredited programme produce competent and high-quality technical manpower compared to those without such accreditation (Obadara and Alaka, 2013; Ogunode and Samuel, 2022).

In essence, no country can compete favourably in the global market with an unskilled workforce, and this inadequacy continues to contribute to youth and graduate unemployment (Okoro as cited in Muoghalu, 2018). Uramu and Ndidi (2012) affirm that national development is impossible without a

technologically competent workforce capable of solving emerging problems. Developing such a workforce requires technical education that builds cognitive, affective and especially psychomotor skills necessary for innovation and industrial productivity. Ikwuka (2019) stresses that although the cognitive domain is well developed in the Nigerian education system, the psychomotor domain remains underutilized, yet holds the key to unlocking learners' practical potentials.

Similarly, the ability of technical colleges to impart these essential psychomotor and technological skills is hindered by persistent challenges such as poor funding, inadequate workshops and laboratories, lack of modern training facilities. Insufficient qualified technical teachers, poor staff training, inadequate power supply and weak collaboration with industry (Nwosu & Micah, 2017). Buttressing the challenges of the technical colleges, authors such as Ayoola (2023); Muoghalu (2018); Oladejo (2019) and Onwusa (2021) argue that these challenges, particularly inadequate physical and material resources, continue to affect curriculum delivery and generally slow down national economic development. Therefore, prioritizing the provision of sufficient instructional resources in automobile trade training is vital for equipping students with the technological know-how needed to transform Nigeria into a productive and industrially competitive nation.

Instructional resources act as inanimate facilitators for effective curriculum delivery. In the context of this study, instructional resources take cognizance of both physical and material resources, including digital and analog facilities such as laboratories, smart classrooms, workshops, tools, machines, equipment, showrooms, playrooms, studios, libraries, and theatres, which are available for imparting practical experiences to automobile trade students. These resources are made available for the sole purpose of concretizing, experimenting, constructing, assembling, and optimizing learning outcomes. According to Okoji and Olubayo (2021), instructional resources refer to the materials and facilities used by both teachers and learners to facilitate effective teaching and learning; hence, they are crucial to instructional process. In addition, instructional materials, including technology, are essential tools in technology education, as they provide a diverse range of resources that can significantly enhance the learning process by promoting engagement, collaboration, and overall instructional effectiveness (Abdulkadir et al, 2025).

Hence, Ekundayo and Alonge (2012) affirm that educational resources are of tremendous importance to the accomplishment of educational objectives and goals worldwide. The authors further affirm that the extent to which an educational institution attains its objectives is directly proportional to the adequacy of resources available for teaching students.

The attainment of educational objectives and goals can be centrally guaranteed through these key variables such as availability and adequacy. Ogbu (2016) views availability as the degree to which facilities, services, or functional materials are provided and made ready for use. In this context of this study, availability refers to the extent to which instructional resources such as tools, machines, workshops, equipment, and both digital and analog materials are made present and ready for use in achieving educational objectives and goals. Adequacy, on the other hand, refers to the sufficient provision of these resources in the required quantity and quality. Thus, availability and adequacy imply not merely the presence of resources, but their sufficiency in accordance with NBTE standards for effective curriculum delivery.

Historically, Nigerian technical colleges have faced challenges such as inadequate funding, resulting in poorly equipped workshops, obsolete tools, insufficient machines, equipment and a shortage of qualified instructors (Uwaifo, 2010; Okoye & Onyenwe, 2016). When resources are lacking, curriculum delivery becomes largely theoretical, contradicting the essence of its establishment and

producing graduates deficient in practical competence. Amadike and Agwi (2016) emphasize that achieving the goals of technical education depends largely on the adequacy of instructional resources.

The availability of instructional resources remains a critical determinant of effective technical and vocational education. The consequences of inadequate availability of instructional resources are evident in Nigeria's rising unemployment, poverty, and reliance on imported goods. Ukachi and Ejiko (2018) attribute Nigeria's technological backwardness to the neglect of technical and vocational education. The country imports simple tools and machines that could be produced locally if technical colleges were adequately equipped to train competent artisans. Onyiah (2020) further argues that developing indigenous technicians would save Nigeria significant foreign exchange spent on importing unsuitable machinery. Corroborating the above, Molagun and Jekayinka (2016) identified a long-standing scarcity of both human and material resources as a critical constraint to the growth and functionality of TVE in Nigeria. Authors further emphasized that even where resources existed, many were obsolete and unfit for delivering 21st century skill-based education.

Similarly, empirical studies consistently revealed that instructional resources for Automobile trade programme in Nigerian technical institutions are largely inadequate. For instance, Ndirimbita and Bwala (2019) reported a low level of availability of instructional facilities for teaching automobile technology in colleges of Education in North-East Nigeria. In the same vein, Salau (2004) reported that equipment in colleges of education in Kwara State were obsolete, limiting their usefulness in skill acquisition, this situation is further compounded by poor maintenance culture, as equipment is frequently left unrepaired until complete breakdown occurs. The lack of instructional resources also extends to specific tools and machines required for technical training. Suleiman et al. (2023) identified the absence of essential workshop tools such as circular saws and mortising machines in technical colleges, while Ogbuanya and Usman (2019) reported inadequate availability of basic hand tools for motor vehicle mechanics work in North-Central Nigeria. In the related study, Ubanwa (2023) found that only a few machines, such as drilling machines and swage blocks, were available, while the majority of required equipment did not meet the minimum standards set by the NBTE.

Furthermore, the availability of consumable materials and modern instructional aids remains limited. Ubanwa (2023) noted that instructional resources such as projectors and computer-aided design tools were available only to a low extent. This inadequacy restricts teachers' ability to deliver contemporary and industry- relevant instruction, particularly in a field like Automobile technology that is rapidly evolving due to technological advancements.

Despite these challenges, some studies indicate moderate availability of certain resources in specific regions. For instance, Meduga et al (2023) reported that about 70% of required resources were available in technical colleges in North-East Nigeria, although this still falls short of optimal standards. Similarly, Akinfolarin et al (2012) found that while some resources were available in colleges of Education in South- West Nigeria, there were notable shortages in key departments.

In essence, majority of the reviewed literature suggests that the availability of instructional resources for Automobile technology in Nigerian technical colleges is inadequate, unevenly distributed, and often below national standards. This inadequacy significantly constrains effective teaching and learning, thereby undermining the objectives of technical education as outlined in the (FRN,2014). Consequently, there is an urgent need for improved funding, proper resource allocation, regular maintenance of facilities to enhance the quality of Automobile technology education in Nigeria.

Conversely, the extent of availability of instructional resources in technical colleges may differ based on ownership, particularly between state and federal technical colleges. Therefore, this study sought to examine both state and federal technical colleges in Anambra state to determine whether these colleges meet minimum benchmark prescribed by NBTE. It is against this backdrop, that the study

evaluates availability and adequacy of automobile trade instructional resources for curriculum delivery in technical colleges in Anambra state, Nigeria, in line with NBTE standards.

Research Question

1. How adequate are the automobile trade instructional resources available for curriculum delivery in technical colleges in Anambra State, Nigeria?

Hypothesis

The research hypothesis below tested at 0.05 alpha level of significance guided the study.

1. There is no significant difference in the adequacy of available automobile trade instructional resources for curriculum delivery between state and federal technical colleges in Anambra State, Nigeria.

Methods

The study adopted a descriptive survey research design. According to Creswell and Creswell (2018), survey design aims at obtaining information useful for providing an empirical, quantitative description of current trends, conditions, or resources statuses within a target population for strategic decision-making. This design is appropriate because it enables the collection of accurate data on the current state of material and physical resources available and their adequacy for curriculum delivery to automobile trade students in both federal and state technical colleges in Anambra state, Nigeria. The study adopted the National Board for Technical Education (NBTE) accreditation benchmark as the standard parameter for evaluating instructional resources. The population comprised four technical staff: two-unit head technical teachers and two technicians drawn from one federal and one state technical college accredited by NBTE to offer automobile trade programme in Anambra state. The selection of the unit heads ensured the collection of reliable data due to their supervisory roles and in-depth knowledge of instructional processes. A census approach was adopted; hence, no sampling procedure was used. The instrument for data collection was a 121-item observational checklist titled "Availability and Adequacy of Instructional Resources for Automobile Trade Curriculum Delivery Questionnaire (AAIRATCDQ)" developed in line with NBTE standards. The instrument had two sections: Section A, collected demographic data, while Section B, measures the adequacy of available instructional resources using NBTE benchmark. Respondents indicated the number of available resources, which were then compared with NBTE standards to determine adequacy. Resources fully provided were equated to 100%. Any items at 100% or above was considered adequate, while those below 100% were regarded as inadequate. Percentage was used to answer the research question, while chi-square was used to test the null hypothesis at the 0.05 level of significance.

Results

Research Question One: How adequacy is the automobile trade instructional resources available for curriculum delivery in technical colleges in Anambra state, Nigeria

Table 1: *Adequacy of Instructional Resources Available for Curriculum Delivery in Automobile Trade Technical Colleges in Anambra State, Nigeria*

S/N	TOOLS/EQUIPMENT	COLLEGE	NBTE MINIMUM	NO. Available	% Available	DECISION
	Tool boxes with keys each comprising one of the following items:	FSTC Awka	10			
		GTC Onitsha	10			

1.	Set of flat, round, half round & triangular files	FSTC Awka	10	5	50	Inadequate
		GTC Onitsha	10	3	30	Inadequate
2.	Set of Warden Files	FSTC Awka	10	1	10	Inadequate
		GTC Onitsha	10	1	10	Inadequate
3.	Flat Chisels	FSTC Awka	10	5	50	Inadequate
		GTC Onitsha	10	5	50	Inadequate
4.	Cross cut chisel	FSTC Awka	10	5	50	Inadequate
		GTC Onitsha	10	5	50	Inadequate
5.	Diamond point chisel	FSTC Awka	10	5	50	Inadequate
		GTC Onitsha	10	3	30	Inadequate
6.	Set of Pin Punches Parallel and taper	FSTC Awka	10	5	50	Inadequate
		GTC Onitsha	10	2	20	Inadequate
7.	Hollow punches Parallel and taper	FSTC Awka	10	5	50	Inadequate
		GTC Onitsha	10	1	10	Inadequate
8.	Ball pein hammer	FSTC Awka	10	3	30	Inadequate
		GTC Onitsha	10	1	10	Inadequate
9.	Plastic hammers/Mallets	FSTC Awka	10	3	30	Inadequate
		GTC Onitsha	10	2	20	Inadequate
10.	Hacksaws with extra blades	FSTC Awka	10	2	20	Inadequate
		GTC Onitsha	10	1	10	Inadequate
11.	300mm engineers rule	FSTC Awka	10	1	10	Inadequate
		GTC Onitsha	10	1	10	Inadequate
12.	Centre punch	FSTC Awka	10	5	50	Inadequate
		GTC Onitsha	10	2	20	Inadequate
13.	6-32mm socket spanner sets with ratchet, brace, extension, U.J and handles	FSTC Awka	10	3	30	Inadequate
		GTC Onitsha	10	3	30	Inadequate
14.	6-32mm open ended flat spanner	FSTC Awka	10	1	10	Inadequate
		GTC Onitsha	10	1	10	Inadequate
15.	6-32mm ring spanners	FSTC Awka	10	1	10	Inadequate
		GTC Onitsha	10	1	10	Inadequate
16.	Emery stone/block or cloth	FSTC Awka	10	1	10	Inadequate
		GTC Onitsha	10	1	10	Inadequate
17.	Plug spanners	FSTC Awka	10	1	10	Inadequate
		GTC Onitsha	10	2	20	Inadequate
18.	Magnets spanner	FSTC Awka	10	1	10	Inadequate
		GTC Onitsha	10	3	30	Inadequate
19.	Allen Keys	FSTC Awka	10	1	10	Inadequate
		GTC Onitsha	10	4	40	Inadequate
20.	Philips screw drivers	FSTC Awka	10	1	10	Inadequate
		GTC Onitsha	10	2	20	Inadequate
21.	Feeler gauges	FSTC Awka	10	5	50	Inadequate
		GTC Onitsha	10	1	10	Inadequate
22.	Oil Cans	FSTC Awka	10	1	10	Inadequate
		GTC Onitsha	10	1	10	Inadequate
23.	Grease guns	FSTC Awka	10	5	50	Inadequate
		GTC Onitsha	10	1	10	Inadequate
24.	Mole grip	FSTC Awka	10	5	50	Inadequate
		GTC Onitsha	10	5	50	Inadequate
25.	File card or cleaner	FSTC Awka	10	1	10	Inadequate
		GTC Onitsha	10	5	50	Inadequate
26.	Spark plug file	FSTC Awka	10	1	10	Inadequate
		GTC Onitsha	10	1	10	Inadequate
27.	Combination pliers	FSTC Awka	10	1	10	Inadequate
		GTC Onitsha	10	1	10	Inadequate

28.	Long nose pliers	FSTC Awka	10	1	10	Inadequate
		GTC Onitsha	10	1	10	Inadequate
29.	Wire cutter and stripper	FSTC Awka	10	1	10	Inadequate
		GTC Onitsha	10	1	10	Inadequate
30.	Tyre pressure guages	FSTC Awka	10	1	10	Inadequate
		GTC Onitsha	10	1	10	Inadequate
31.	Metal scrappers	FSTC Awka	10	1	10	Inadequate
		GTC Onitsha	10	1	10	Inadequate
	DRILLING AND SCREW CUTTING		**10**	1	10	
32.	Electric Hand Drill	FSTC Awka	2	1	50	Inadequate
		GTC Onitsha	2	1	50	Inadequate
33.	Drill bits	FSTC Awka	2	1	50	Inadequate
		GTC Onitsha	2	1	50	Inadequate
34.	Set of stock and dies – UNC, UNF and metric	FSTC Awka	3	1	33	Inadequate
		GTC Onitsha	3	1	33	Inadequate
35.	Taps & Wrenches – UNC, UNF and Metric	FSTC Awka	2	1	50	Inadequate
		GTC Onitsha	2	1	50	Inadequate
36.	Thread file	FSTC Awka	2	1	50	Inadequate
		GTC Onitsha	2	1	50	Inadequate
37.	Screw (Stud) extractor set	FSTC Awka	2	1	50	Inadequate
		GTC Onitsha	2	1	50	Inadequate
38.	Screw (Stud) extractor set	FSTC Awka	2	1	50	Inadequate
		GTC Onitsha	2	1	50	Inadequate
39.	Inside Calipers (Spring Type)	FSTC Awka	5	0	0	Inadequate
		GTC Onitsha	5	1	20	Inadequate
40.	Outside Calipers (Spring Type)	FSTC Awka	5	0	0	Inadequate
		GTC Onitsha	5	0	0	Inadequate
41.	Odd leg calipers	FSTC Awka	5	0	0	Inadequate
		GTC Onitsha	5	1	20	Inadequate
42.	Surface plate	FSTC Awka	2	1	50	Inadequate
		GTC Onitsha	2	1	50	Inadequate
43.	Vee blocks	FSTC Awka	8	1	13	Inadequate
		GTC Onitsha	8	1	13	Inadequate
44.	Scribing block	FSTC Awka	2	1	50	Inadequate
		GTC Onitsha	2	1	50	Inadequate
45.	Vernier Calipers (Metric)	FSTC Awka	3	1	33	Inadequate
		GTC Onitsha	3	1	33	Inadequate
46.	Micrometer 0-25mm, 25-50mm	FSTC Awka	3	1	33	Inadequate
		GTC Onitsha	3	2	67	Inadequate
47.	Dial indicator (gauge) with magnetic stand	FSTC Awka	2	1	50	Inadequate
		GTC Onitsha	2	1	50	Inadequate
48.	Off hand grinding machine with assorted wheels	FSTC Awka	1	0	0	Inadequate
		GTC Onitsha	1	0	0	Inadequate
49.	Bench grinder with wheels	FSTC Awka	1	1	100	Adequate
		GTC Onitsha	1	1	100	Adequate
50.	Workshop plan Goggles	FSTC Awka	20	0	0	Inadequate
		GTC Onitsha	20	0	0	Inadequate
51.	Blow lamps	FSTC Awka	5	2	40	Inadequate
		GTC Onitsha	5	1	20	Inadequate
52.	Soldering iron	FSTC Awka	5	1	20	Inadequate

		GTC Onitsha	5	2	40	Inadequate
53.	Electric soldering iron	FSTC Awka	5	1	20	Inadequate
		GTC Onitsha	5	2	40	Inadequate
54.	Solder and flux	FSTC Awka	1	1	100	Adequate
		GTC Onitsha	1	2	200	Adequate
55.	Compressor 200-300 P.T.S 3 phase motor driven type complete with spray gun, grease, horse reels	FSTC Awka	1	0	0	Inadequate
		GTC Onitsha	1	0	0	Inadequate
56.	Wheel balance (Rim 13 – 15)	FSTC Awka	1	1	100	Adequate
		GTC Onitsha	1	2	200	Adequate
57.	Air line gauge	FSTC Awka	2	2	100	Adequate
		GTC Onitsha	2	1	50	Inadequate
58.	Portable tyre inflator	FSTC Awka	2	1	50	Inadequate
		GTC Onitsha	2	5	250	Adequate
59.	Steam Cleaner (complete) oil fired or electric	FSTC Awka	1	1	100	Adequate
		GTC Onitsha	1	2	200	Adequate
60.	Oil fired or electric	FSTC Awka	1	0	0	Inadequate
		GTC Onitsha	1	1	100	Adequate
61.	Weld master Vulcanize	FSTC Awka	1	1	100	Adequate
		GTC Onitsha	1	1	100	Adequate
62.	Various sizes wheel braces	FSTC Awka	3	2	66	Inadequate
		GTC Onitsha	3	0	0	Inadequate
63.	Tyre changer complete with bead breaker	FSTC Awka	1	1	100	Adequate
		GTC Onitsha	1	1	100	Adequate
64.	Heavy duty tyre changer	FSTC Awka	1	1	100	Adequate
		GTC Onitsha	1	2	200	Adequate
65.	Tyre repair kit comprising: rasp, scissors, tyre, knife, sticher, spiral wound wire brush etc.	FSTC Awka	3	1	33	Inadequate
		GTC Onitsha	3	1	33	Inadequate
66.	Wire brush set	FSTC Awka	5	5	100	Adequate
		GTC Onitsha	5	1	20	Inadequate
67.	Battery Charger	FSTC Awka	1	1	100	Adequate
		GTC Onitsha	1	5	500	Adequate
68.	2100 or 2080 plus special wrenches for removal of oil filter	FSTC Awka	2	0	0	Inadequate
		GTC Onitsha	2	0	0	Inadequate
69.	Pipe wrench, clamp or vice	FSTC Awka	3	2	67	Inadequate
		GTC Onitsha	3	2	67	Inadequate
70.	Pipe Cutter	FSTC Awka	2	2	100	Adequate
		GTC Onitsha	2	2	100	Adequate
71.	Wheel alignment gauge	FSTC Awka	2	1	50	Inadequate
		GTC Onitsha	2	1	50	Inadequate
72.	Plug spanners (long and short)	FSTC Awka	2	2	100	Adequate
		GTC Onitsha	2	3	150	Adequate
73.	Battery Service Kit	FSTC Awka	2	1	50	Inadequate
		GTC Onitsha	2	3	150	Adequate
74.	Adjustable Wrench	FSTC Awka	3	3	100	Adequate
		GTC Onitsha	3	1	33	Inadequate
75.	Clutch alignment gauge	FSTC Awka	5	1	20	Inadequate
		GTC Onitsha	5	1	20	Inadequate
76.	Clutch set-screw gauge	FSTC Awka	2	0	0	Inadequate
		GTC Onitsha	2	0	0	Inadequate
77.	Valve grinders	FSTC Awka	2	2	100	Adequate

		GTC Onitsha	2	2	100	Adequate
78.	Injector repair machine	FSTC Awka	1	1	100	Adequate
		GTC Onitsha	1	1	100	Adequate
79.	Injector needle service kit	FSTC Awka	1	1	100	Adequate
		GTC Onitsha	1	1	100	Adequate
80.	Hydrometers	FSTC Awka	4	4	100	Adequate
		GTC Onitsha	4	2	50	Inadequate
81.	Vacuum Tester	FSTC Awka	4	1	25	Inadequate
		GTC Onitsha	4	1	25	Inadequate
82.	Pullers (different sizes)	FSTC Awka	2	2	100	Adequate
		GTC Onitsha	2	1	50	Inadequate
83.	Spark plug with vices	FSTC Awka	4	0	0	Inadequate
		GTC Onitsha	4	1	25	Inadequate
84.	Work bench with vices	FSTC Awka	2	2	100	Adequate
		GTC Onitsha	2	1	50	Inadequate
85.	Portable engine Hoist	FSTC Awka	3	1	33	Inadequate
		GTC Onitsha	3	1	33	Inadequate
86.	Diesel phasing & Calibration Machine	FSTC Awka	1	0	0	Inadequate
		GTC Onitsha	1	0	0	
87.	Electrical test bench	FSTC Awka	1	1	100	Adequate
		GTC Onitsha	1	1	100	Adequate
88.	Cylinder boring machine with accessories and assorted tools	FSTC Awka	1	0	0	Inadequate
		GTC Onitsha	1	0	0	Inadequate
89.	Honing Machine with Accessories and assorted cutters	FSTC Awka	4	0	0	Inadequate
		GTC Onitsha	4	1	25	Inadequate
90.	Bottle jack (hydraulic) heavy vehicle type	FSTC Awka	2	1	50	Inadequate
		GTC Onitsha	2	1	50	Inadequate
91.	Ram up to 6 tonne capacity	FSTC Awka	1	0	0	Inadequate
		GTC Onitsha	1	0	0	Inadequate
92.	Trolley jacks	FSTC Awka	2	1	50	Inadequate
		GTC Onitsha	2	2	100	Adequate
93.	Dynamometers	FSTC Awka	1	0	0	Inadequate
		GTC Onitsha	1	1	100	Adequate
94.	Motor scope (Engine analyzer)	FSTC Awka	2	1	50	Inadequate
		GTC Onitsha	2	1	50	Inadequate
95.	Timing light	FSTC Awka	4	1	25	Inadequate
		GTC Onitsha	4	3	75	Inadequate
96.	Tachometer	FSTC Awka	2	1	50	Inadequate
		GTC Onitsha	2	1	50	Inadequate
97.	Hydraulic press	FSTC Awka	1	1	100	Adequate
		GTC Onitsha	1	1	100	Adequate
98.	Inspection pits	FSTC Awka	2	1	50	Inadequate
		GTC Onitsha	2	1	50	Inadequate
99.	Dwell tester	FSTC Awka	2	0	0	Inadequate
		GTC Onitsha	2	0	0	Inadequate
100.	Armature growler	FSTC Awka	1	0	0	Inadequate
		GTC Onitsha	1	0	0	Inadequate
101.	Compression gauge	FSTC Awka	2	1	50	Inadequate
		GTC Onitsha	2	1	50	Inadequate
102.	Ammeter	FSTC Awka	2	0	0	Inadequate

		GTC Onitsha	2	1	50	Inadequate
103.	Voltmeter	FSTC Awka	2	0	0	Inadequate
		GTC Onitsha	2	1	50	Inadequate
104.	Ohmmeter	FSTC Awka	2	0	0	Inadequate
		GTC Onitsha	2	0	0	Inadequate
105.	Avometer (multimetre)	FSTC Awka	2	1	50	Inadequate
		GTC Onitsha	2	1	50	Inadequate
106.	Lucas instructional chassis	FSTC Awka	1	1	100	Adequate
		GTC Onitsha	1	1	100	Adequate
107.	Valve spring compressor kit	FSTC Awka	2	1	50	Inadequate
		GTC Onitsha	2	1	50	Inadequate
108.	Coil spring compressor	FSTC Awka	2	0	0	Inadequate
		GTC Onitsha	2	2	100	Adequate
109.	Torque wrench pre-set type metric graduation	FSTC Awka	2	1	50	Inadequate
		GTC Onitsha	2	1	50	Inadequate
110.	Torque wrench dial type (metric)	FSTC Awka	2	1	50	Inadequate
		GTC Onitsha	2	1	50	Inadequate
111.	Hydraulic nipple forming tool	FSTC Awka	1	1	100	Adequate
		GTC Onitsha	1	1	100	Adequate
112.	Flaring tool for steel tubing	FSTC Awka	1	1	100	Adequate
		GTC Onitsha	1	2	200	Adequate
113.	Small bore pipe bending tool	FSTC Awka	1	0	0	Inadequate
		GTC Onitsha	1	0	0	Inadequate
114.	Carburetor service kit	FSTC Awka	1	0	0	Inadequate
		GTC Onitsha	1	5	500	Adequate
115.	Piston ring compressor	FSTC Awka	2	5	250	Adequate
		GTC Onitsha	2	0	0	Inadequate
116.	Exhaust gas analyzer	FSTC Awka	2	0	0	Inadequate
		GTC Onitsha	2	4	200	Adequate
117.	Axle stands	FSTC Awka	8	4	50	Inadequate
		GTC Onitsha	8	0	0	Inadequate
118.	Fire extinguishers	FSTC Awka	4	2	50	Inadequate
		GTC Onitsha	4	2	50	Inadequate
119.	Sand buckets	FSTC Awka	4	2	50	Inadequate
		GTC Onitsha	4	2	50	Inadequate
120.	Water buckets	FSTC Awka	4	2	50	Inadequate
		GTC Onitsha	4	1	25	Inadequate
121.	First aid box	FSTC Awka	1	1	100	Adequate
		GTC Onitsha	1	5	500	Adequate

Table 1 shows that instructional resources for automobile trade in technical colleges in Anambra State were inadequately available when compared with NBTE minimum standards. The majority of tools and equipment in both FSTC Awka and GTC Onitsha reveal availability levels below 50% with many items as low as 0-30%, indicating serious shortages of instructional resources in automobile trade.

Hypothesis one: There is no significant difference in the adequacy of available automobile trade instructional resources for curriculum delivery between state and federal technical colleges in Anambra State, Nigeria.

Table 2: *Summary of chi-square test of independence for adequacy of available instructional resources and school type (federal Vs State)*

	Federal	State			Federal	State	
A	199	162	361	A	183.08	177.92	361
NA	457.5	476	933.5	NA	473.42	460.08	933.5
	656.5	638	1294.5		656.5	638	1294.5

	Federal	State			
A	1.38443	1.42457	2.809	**X^2**	2.809
NA	0.53538	0.55091	1.08629	**DF**	1
	1.91981	1.97548	3.89528	**P-Value**	0.094

From the table 2, the chi-square test shows no significant difference in the adequate availability of automobile trade instructional resources between federal and state technical colleges in Anambra State, Nigeria, with x2 (1) = 2.81, p=.094. Since p > 0.05, the null hypothesis was not rejected, indicating no significant difference between the school types.

Discussion

The finding of the study on availability and adequacy of automobile trade instructional resources for curriculum delivery in technical colleges in Anambra State, Nigeria revealed a critical shortfall in the provision of adequate and available instructional resources for curriculum delivery in automobile trade in both federal and state-owned technical colleges in Anambra State, Nigeria. Based on the NBTE minimum standard benchmark, each technical college is expected to have a total of 121 instructional resource items adequately available in the right quantity in both federal and state technical colleges respectively for effective curriculum delivery in the automobile trade. However, the data collected indicated that the available items across the colleges were grossly inadequate, hence significantly falling below the NBTE benchmark.

This shortfall manifests across nearly every category of resources required for effective practical instruction, including diagnostic equipment, hand tools, workshop machines, training models, and consumable materials needed for repeated demonstrations and student practice. Where items exist at all, they are frequently available in numbers far too small to allow each student adequate hands-on exposure, forcing large groups of learners to share a single tool or piece of equipment during practical sessions. This not only slows down the pace of skill acquisition but also reduces the amount of individualized practice time each student receives, a factor that is particularly critical in a trade area such as automobile technology where competence is built primarily through repeated physical engagement with tools, components, and systems rather than through theoretical instruction alone.

The near-uniform inadequacy observed across both federal and state-owned colleges suggests that the problem is not confined to ownership type or governance structure, but reflects a broader systemic challenge in the funding, equipping, and maintenance of technical education infrastructure in the state. It is plausible that limited budgetary allocations to technical colleges, irregular release of funds for equipment procurement, and the absence of structured maintenance and replacement schedules have combined over time to erode whatever resource base existed at the point of establishment of these institutions. Equipment that may have been adequate decades ago has, in many cases, become obsolete, damaged beyond repair, or simply removed from use without replacement, leaving a widening gap between what is available and what current NBTE standards demand.

This is in consonance with the research finding of Ndirimbita and Bwala (2019), which reported a low level of availability of instructional facilities for teaching automobile technology in colleges of education in North-East Nigeria. The convergence of findings from two different geopolitical zones and institutional categories, technical colleges in Anambra State and colleges of education in North-East Nigeria, lends weight to the argument that inadequate provisioning of instructional resources for automobile trade is not a localized or isolated problem but rather a pervasive feature of technical and vocational education delivery across much of the country.

Similarly, Ubanwa (2023) found that only a few machines, such as drilling machines and swage blocks, were available, while the majority of required equipment did not meet the minimum standards set by the NBTE. The specificity of this finding, that even the few items present are often of substandard quality or outdated specification, adds another dimension to the present study's results. It suggests that the problem is not solely one of quantity but also one of quality and currency of available resources, meaning that even colleges that report having "some" equipment may still be unable to deliver instruction that reflects current industry practices and technologies in the automobile sector.

Taken together, these findings have far-reaching implications for the quality of graduates produced by these technical colleges. Students who complete their training without sufficient exposure to standard tools, modern diagnostic equipment, and adequately equipped workshops are likely to graduate with significant gaps between the competencies certified by their qualifications and the actual skills demanded by employers in the automobile repair and servicing industry. This mismatch may contribute to the broader concern often raised by industry stakeholders regarding the employability and on-the-job readiness of technical college graduates, and may push many graduates toward informal apprenticeship arrangements to acquire the practical skills their formal training failed to provide. The persistence of this resource gap, despite clearly articulated NBTE benchmarks, further raises questions about the effectiveness of existing monitoring, accreditation, and quality assurance mechanisms in ensuring that technical colleges meet minimum standards before and during their operation.

Conclusion

This study has shown that automobile trade programmes in both federal and state-owned technical colleges in Anambra State suffer from a serious shortfall in instructional resources, falling well below the NBTE's benchmark of 121 required items. Such deficiencies undermine effective curriculum delivery and limit students' acquisition of the practical skills needed for employability in the automotive industry. Addressing this gap requires concerted action from government agencies, college administrators, and regulatory bodies to ensure technical colleges are equipped in line with NBTE standards.

References

Abdulkadir,S., Shuaibu, A.S. & Chida, A.A.(2025). Assessment of Instructional Materials in Technical Colleges of Adamawa State, Nigeria. *International Journal of Humanities Social Science and Management (IJHSSM),5*(3),256-262. www.ijhssm.org

Akinfolarin, C. A., Ajayi, I. A & Oloruntegbe, K. O. (2012). An appraisal of resource utilization in vocational and technical education in selected colleges of education in South-West Nigeria. *Education, 2*(1), 41-45. https://doi:10.5923/j.edu.20120201.08.

Amadike,O. & Agwi, V.I.A.(2016). Status of workshop facilities in technical college in Rivers State. *Journal of Resourcefulness and Distinction,44*(1),1-13. Retrieved from https://www.globalacademicgroup.com>journals

Ayoola, A. (2023). Funding technical vocational education and training (TVET) for productivity, employability and sustainable development in Nigeria. *Annals of Technology Education Practitioners Association of Nigeria, 6*(4), 71-79.https://www.researchgate.net/publication/381999077

Bello,O., Aminu, H. & Okafor, O.E.(2024). Evolution of accreditation scheme in the Nigerian technical and vocational education and training institutions and strategies for developing the scheme. *British Journal of Contemporary Education, 4*(1), 54-73. https://doi.org/10.52589/BJCE-HYJULSSW

Creswell, J.W. & Creswell, J.D. (2018). *Research design: Qualitative, quantitative, and mixed methods approach* (5th). SAGE Publications

Ekundayo, H. T. & Alonge, H.O. (2012). Human and material resources as correlates of academic performance of private and public secondary school students in Ondo state, Nigeria. *European Scientific Journal,8*(10), 170-180. https://eujournal.org>esj>article

Eze, T.I. (2009). Skill development in science and technology education for millennium development goals, 9th National Conference of Federal College of Education (Technical) Umuneze, Anambra State, Nigeria.

Eze, T.I., Onwusa,S.C., Oluyinka, O.B. & Nwaosa, F.I.(2020). Assessment of the extent of auto-mechanics teachers' utilization of instructional materials for teaching in technical colleges in Edo and Delta states, Nigeria. *Education Research Journal, 10*(10), 315-317.https://www.researchgate.net/publication/348620858

Federal Republic of Nigeria (2013). *National Policy on Education (revised*). Lagos: Education Research and Development Council (NERDC) Press

Federal Republic of Nigeria (2014). *National policy on education.* Lagos: Nigerian Educational Research and Development Council (NERDC) Press

Ikwuka, O.I. (2019). *General teaching methods. Anambra state*: SCOA Heritage Nig.Ltd

Medugu, J.D., Muhammad, Z.I., & Ibrahim, U. (2023). Assessment of availability and adequacy of workshop facilities for practical skills acquisition in technical colleges in the North East geopolitical zone, Nigeria. *International Journal of Innovative Scientific & Engineering Technologies Research, 11*(4), 61-71. www.sehipaj.org

Molagun, H.M. & Jekayinfa, A. A. (2016). Non-availability of resources as an impediment to effective development of technical and vocational education (TYE) in Kwara state, Nigeria. *African Journal of Historical Sciences in Education,12*(1). https://www.kwcoeilorin.edu.ng

Muoghalu, N.C. (2018). Challenges of technical and vocational education in Nigeria. *International Journal of Research, 5*(1), 3279-3292.http://edupediapublicatins.org/journals/index.php/ijR/

National Board for Technical Education (2013*). National Technical Certificate Examination (craft level) syllabus for Engineering trades based on the NBTE modular curricular*. Kaduna: NBTE

Ndirmbita, T.G. & Bwala, B.M. (2019). Evaluation of facilities for teaching and learning of automobile technology in colleges of education in north-east zone of Nigeria. *International Journal of Innovative Information system and Technology Research,7*(1),50-59. Retrieved from https://www.seahipaj.org

Nwosu, J.C. & Micah, E.M. (2017). Technical and vocational education and training as a tool for national sustainable development. *International Journal of Social Sciences and Humanities Invention,4*(9), 3983-3988

Obadara, O.E. & Alaka, A.A. (2013). Accreditation and Quality Assurance in Nigerian Universities. *Journal of Education and Practice, 4*, 8, 34-41. https://www.iiste.org/Journals/index.php/JEP/article/view/5184#google_vignette

Odo, J.U., Okafor, W.C., Odo, A.L., Ejikeugwu, L. N. & Ugwuoke, C.N. (2017). Technical education: The key to sustainable technological development. *Universal Journal of Educational Research, 5*(11), 1879-1884.https://www.hrpub.org

Ogbu, J.E. (2016). Availability and utilization of instructional facilities and material for the effective teaching of Basic Electricity in Ebony State technical colleges. *International*

Journal of Vocational and Technical Education Research, 2(4), 32-40.www.eajournals.org

Ogbuanya, T.C. & Usman, D A. (2019). Assessment of instructional facilities in implementing the contents of the motor vehicle mechanics' work curriculum in technical colleges in north-central Nigeria. *Jurnal Pendidikan Teknologi dan Kejuruan,26*(2), 96-106. https://doi:10.21831/jptk.v26i2.30965

Ogunode, N. J. & Samuel, A. (2022). Accreditation of academic programs in public universities in Nigeria: Challenges and way forward. *Electronic Research Journal of Social Sciences and Humanities, 4*(2), 15-27.www.eresearchjournal.com

Okoji, O.O., & Olubayo, M.A. (2021). Assessment of availability and utilization of instructional resources for teaching primary school mathematics in IIorin metropolis, Nigeria. African *Journal of Educational Studies in Mathematics and Sciences, 17*(2), 1-12. https://doi:10.4314/ajesms.v17i2.1

Okoye, R. & Onyenwe, A. (2016). Technical and vocational education education in Ngeria: Issues, challenges and way forward. Journal of Education and practice, 7(3), 113-118. https://files.eric.ed.gov

Oladejo, M.T. (2019). Challenges of technical and vocational education and training in Nigerian history. *Makerere Journal of Higher Education, 11*(1), 67-81. https://dx.doi.org/10.4314/majohe.v11i1.6

Onyiah, I.A., Aneke, S.C., & Otiji, O. (2020). An empirical review of the impact of technical and vocational education in nation building. *British International Journal of Education and SocialSciences,7*(2), https://ciidjournal.com/index.php/bijess/article/view/215

Salau, K.K. (2004). Relationship among policy guidelines, implementation, and effectiveness of vocational education programmes in kwara State Colleges of Education. (Unpublished M. ed. Thesis). University of Ilorin.

Suleiman, D.A., Bamidele, S.T & Ndashiru, M. (2023). Assessment of workshop facilities for effective teaching of woodwork technology in technical colleges in Kwara state. *Journal of School of Education,4*(1),27-42. https:kwacoetl.edu.ng>lssues>

Ubanwa, S.C. (2023). *Assessment of workshop resources for effective teaching and learning of fabrication and welding craft practice in technical colleges in Nigeria* [Master's thesis, Federal University of Technology, Minna]. http://irpo.futminna.edu.ng>jupui>bitstream

Ukachi, P.A. & Ejiko, S.O. (2018). Importance of vocational technical education in present day Nigeria economy. *Global Scientific Journal, 6*(8), 530-534. www.globascientificjournal.com

Urama, M. S. & Ndidi, O. (2012). Manpower development in technical and vocational education (TVE) a prerequisite for the technological development of Nigeria. Knowledge Review: *Multidisciplinary Journal, 26*(4),129-135. https://www.globalacademicgroup.com/journals/knowledge%20review/MANPOWER%20DEVELOPMENT%20IN%20TECHNICAL.pdf

Uwaifo, V. O. (2010) Technical Education and its Challenges in Nigeria in the 21st Century. *International NGO Journal, 5*(2), 040-44, Retrieved from https://www.academicjournal.org/ingoj