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Acquisition of Autotronics Maintenance Skills for Employability of Motor Vehicle Mechanic Works Students in Technical Colleges Rivers State

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Abstract: *The study examined the acquisition of autotronics maintenance skills for employability of motor vehicle mechanic works students in Technical Colleges in Rivers State. Three research questions were answered in the study with corresponding null hypotheses that were formulated and tested at 0.05 level of significance. The study adopted the descriptive research survey design. The population of the study consist of all the 13 teachers of Motor Vehicle Mechanic Works trade in Government Technical Colleges and all the 91 technicians in 13 registered mechanic workshops in Rivers State. There was no sampling since it was a census study. The instrument for the data collection was a self-constructed questionnaire titled "Acquisition of Autotronics Maintenance Skills for Employability Questionnaire" designed in the patterned of a modified 4-point modified rating scale of agreement. The instrument for the study was content validated by two experts. A reliability coefficient of 0.81, 0.88 and 0.84 were established for different sections of the instrument using Cronbach Alpha. Data collected were analysed with mean and standard deviation to answer the research questions while the null hypotheses were tested with z-test. The study found that acquisition of autotronic maintenance skills such as electronic ignition system maintenance skills, electronic suspension system maintenance skills and On-Board Diagnosis system maintenance skills enhance employability of motor vehicle mechanic works students in Technical Colleges in Rivers State. Based on the findings of the study, it was recommended among others that electronic ignition system maintenance skills should be integrated in instructional delivery of motor vehicle mechanics trade by National Board for Technical Education because acquisition of these skills will make students to be effective in maintaining modern vehicles and enhance employability. The National Board for Technical Education (NBTE) should integrate electronic suspension system maintenance skills as autotronic skills in instructional delivery of motor vehicle mechanics trade as acquisition of these skills will enhance employability of students and that students of motor vehicle mechanic trade should be trained on On-Board Diagnosis system skills as autotronic maintenance skills through instructional delivery as this will make students to be effective in maintaining modern vehicles and enhance employability.*

Keyword: *Acquisition, Autotronics, Maintenance Skills and Employability.*

Introduction

In today's Nigerian society, one of the most challenges facing the youths is unemployment which have resulted to youth restiveness, economic depression, lack of food, insecurity among others. These aftermaths of unemployment can be reduced if the youths are engaged in meaningful activities usher-in through training of the mind. These challenges exist because majority of the youths are not engaged in meaningful activities as a result poor possession of required productive and marketable skills needed for paid or self-employment in the industries (Deebom & Okwelle, 2016). One of such tools that can be used to create development of the mind is effective education. Education in 21st century is meant for the development of human mindset in order to manipulate the cognitive and psychomotor in performing a productive work that will in turn improve individual economic condition. Addressing these challenges, the federal government introduce the technical college for skill development. Technical Colleges are designed to equip students with the skills necessary for various occupations, thereby preparing them for the demands of the workplace. Technical College curriculum is segmented into distinct trades, each with corresponding modules, allowing learners to select and master trades aligned with their interests and aspirations. Among the array of trades offered, the automobile trade stands out, encompassing disciplines such as auto electric works, motor vehicle mechanics, vehicle body building, and agricultural implement mechanics.

Motor Vehicle Mechanic Works (MVMWs) is a key technical trade offered within Technical Colleges, focusing on imparting scientific knowledge encompassing the design, material selection, construction, operation, and maintenance of motor vehicles. This program aims to cultivate skilled auto mechanics proficient in various aspects of automobile maintenance and repair, including brakes, transmissions, engines, fuel systems, cooling systems, and lubrication systems, in accordance with manufacturers' specifications, as outlined by the National Board for Technical Education (NBTE, 2011).

Motor Vehicle Mechanic Works trade offered in Government Technical Colleges is designed to provide the learner with both theoretical knowledge and practical skills, thereby enhancing employability opportunities after acquiring the requisite skills in vehicle servicing and maintenance. Acquisition of these skills makes graduates to secure gainful employment, establish workshops, pursue self-employment opportunities, and potentially employ others, thus contributing to both personal and societal prosperity.

Employability encompasses an individual's ability to secure meaningful employment, influenced by personal circumstances and market dynamics (McQuaid & Lindsay, 2005). It encapsulates a blend of achievements, comprehension, and personal traits that enhance prospects for employment and success in chosen vocations. Specifically, within the context of Motor Vehicle Mechanic Works students, employability denotes the requisite skills demanded for effective participation in the contemporary workforce. This entails possessing a set of attributes, skills, and knowledge essential for workplace effectiveness, benefiting both individuals and employers. These skills include data analysis, problem-solving abilities, and proficiency in utilizing modern technologies prevalent in the automobile industry.

The advent of autotronic, encompassing electronic science in modern automobile design and construction, signifies a paradigm shift in automotive technology (Udogu, 2015; Soni, 2018). Today's vehicles integrate electrical and electronic components alongside mechanical systems, ushering in a new era of digital, intelligent, and user-friendly

automobiles. Notably, over eighty percent of automotive innovations now stem from electronic components, highlighting the prominence of autotronic advancements (Soni, 2018). Given this technological landscape, proficiency in autotronic skills is imperative for effectively designing, repairing, and maintaining modern vehicles to manufacturers' specifications (NBTE, 2011). Accordingly, motor vehicle mechanic work instructors should employ instructional methods aligned with industry needs to equip students with contemporary skills required for employability.

Deebom and Daerego (2020) described skill as the ability of an individual to be able to carry out a specialized area in motor vehicle mechanic works trade (autotronics) expertly for self-reliance. Skill refers to the ability to do something perfectly well or accurately with dexterity and that through which one has studied and practiced in training (Onoh, 2011). Skill is also an ability and capacity acquired through deliberate, systematic and sustained effort to smoothly and adaptively carryout complex activities or job functions involving ideas (cognitive skill) things (technical skills) and/or people (interpersonal skills) (Crammer, 2014). It will not be an overstatement to say skills acquisition is a programme made up of various kinds of skills to provide basic and special training/skills and capacity building/empowerment for the upliftment and well-being of an individual or a people in a defined trade such as autotronic (Adofu in Deebom & Daerego, 2020).

Autotronic skills denote the capacity to utilize autotronic principles in designing, diagnosing, repairing, and maintaining innovative automotive systems. Autotronic skills manifest in various automotive electronic controls, including electronic power steering, smart airbag systems, electronic braking, engine management, automatic transmission, onboard diagnostics, among others (Ezeama, Oguejiofor & Uzoejinwa, 2016). Modern vehicles comprise intricate electronic components requiring sophisticated testing and servicing, underscoring the necessity for autotronic skills among motor vehicle mechanic work students in Technical Colleges. These skills encompass a range of electronic systems, including power steering, braking, transmission, ignition, cooling, lubrication, suspension, and diagnostic procedures, reflecting the multifaceted nature of contemporary automotive maintenance.

According to Deebom (2015), maintenance may be described as day-to-day activities carried on in order to keep an equipment, tools, machines functional in a good working and serviceable condition to ensure continual operation of the system. This ensures that pieces of equipment or item remains functional and serve users better. According to Umurhurhu (2019), maintenance implies taking specific steps and precautions to care for a device (automobile) to ensure that it reaches its maximum life span. Maintenance is a repair activity carried out on vehicles or other machineries to keep them unaltered, and if altered, to restore them to their original state (Ekong & Ekong, 2016). Mbah (2016) also stated that maintenance involves taking specific approved steps and precautions to care for a piece of equipment, machinery or facility to ensure it attains its maximum life span. According to Mbah and Oluka (2021), maintenance is the adherence to the manufacturer's schedule for vehicle upkeep and the repair of faulty systems that have led to malfunctioning. The author further aver that it is the ability to effectively carry out maintenance in modern vehicles requires the use of new technological skills different from the conventional technical skills already acquired by graduates of motor vehicle mechanic works in technical colleges for employment (Mbah & Oluka, 2021). In light of these developments, the acquisition of autotronic skills for enhancing the employability of motor

vehicle mechanic works students in Technical Colleges in Rivers State becomes necessary.

Statement of the Problem

The aim of Technical Colleges, is to equip individuals with entrepreneurial, technical, and vocational skills in a specific job trades thereby self-reliance. One of the trades offers in Technical College is motor vehicle mechanic whose students are trained primarily on manually operated vehicles, necessitating manual repair and servicing techniques. These skills, effectively imparted in technical colleges, rendered graduates' valuable assets in both the industry and society, enabling them to secure either self-employment or paid positions.

Nevertheless, the researchers observed that in this present digital world, the advancements in science and technology have gradually rendered many motor vehicle maintenance skills taught in Technical Colleges obsolete. Hence, graduates of motor vehicle mechanic could not possess the skills required to maintain modern or hybrid vehicles prevalent in the 21st century, leading to the outsourcing of repairs to other States or even back to manufacturers. This trend has resulted in redundancy and irrelevance among Motor Vehicle Mechanic Works graduates, with many struggling to secure employment due to their inadequate proficiency in autotronic maintenance skills essential for servicing and repairing modern vehicles.

This is in line with Nna (2011) as opined that modern vehicles are increasingly equipped with intricate electronic components and controls, demanding a higher level of sophistication for testing, servicing, and diagnosis, along with specialized tools and instrument such as On-Board Diagnose instruments. This implies that its maintenance activities must be done by someone that possess the requisite skills in autotronic services. It is against this backdrop that this study aims to examine the acquisition of autotronics maintenance skills for employability of motor vehicle mechanic works students in Technical Colleges in Rivers State.

Purpose of the Study

The purpose of the study is to examine the acquisition of autotronics maintenance skills for employability of motor vehicle mechanic works students in Technical Colleges in Rivers State. Specifically, the study sought to find out how acquisition of;

1. Electronic ignition system maintenance skills enhance employability of motor vehicle mechanic works students in Technical Colleges in Rivers State.
2. Electronic suspension system maintenance skills enhance employability of motor vehicle mechanic works students in Technical Colleges in Rivers State.
3. On-Board Diagnosis system maintenance skills enhance employability of motor vehicle mechanic works students in Technical Colleges in Rivers State.

Research Questions

The following research questions were answered in the study.

1. How acquisition of electronic ignition system maintenance skills enhance employability of motor vehicle mechanic works students in Technical Colleges in Rivers State?
2. How acquisition of electronic suspension system maintenance skills enhance employability of motor vehicle mechanic works students in Technical Colleges in Rivers State?

3. How acquisition of On-Board Diagnosis system maintenance skills enhance employability of motor vehicle mechanic works students in Technical Colleges in Rivers State?

Hypotheses

The following null hypotheses were formulated and tested in the study at 0.05 level of significance.

1. There is no significance difference in the mean response of Motor Vehicle Mechanic Works teachers and Motor Vehicle Mechanic technician on how acquisition of electronic ignition system maintenance skills enhance employability of motor vehicle mechanic works students in Technical Colleges in Rivers State.
2. There is no significance difference in the mean response of Motor Vehicle Mechanic Works teachers and Motor Vehicle Mechanic technician on how acquisition of electronic suspension system maintenance skills enhance employability of motor vehicle mechanic works students in Technical Colleges in Rivers State.
3. There is no significance difference in the mean response of Motor Vehicle Mechanic Works teachers and Motor Vehicle Mechanic technician on how acquisition of On-Board Diagnosis maintenance skills enhance employability of motor vehicle mechanic works students in Technical Colleges in Rivers State.

Methodology

The study adopted the descriptive research survey design. This study was carried out in Technical Colleges in Rivers State. The target population of the study consist of all the 13 teachers of Motor Vehicle Mechanic Works trade in Government Technical Colleges (GTC) and all the 91 Motor Vehicle Mechanic Technicians from 13 registered mechanic workshops in Rivers State. This gives a total target population of 104 respondents. This gives a total target population of 104 respondents. The instrument for the data collection was a self-constructed questionnaire titled “Acquisition of Autotronics Maintenance Skills for Employability Questionnaire” (AAMSEQ) which was designed in the patterned of a modified 4-point rating of Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD) with numerical values of 4, 3, 2 and 1 respectively. The instrument was content validated by two experts and tested for reliability. A reliability coefficient of 0.81, 0.88 and 0.84 was established for different sections of the instrument using Cronbach Alpha. Data collected were analysed using Mean and Standard Deviation to answer research questions while the null hypotheses formulated were tested with z-test. The decision rule for the analysis was such that item with mean value between 3.50 – 4.00 was taken as Strongly Agree (SA) while item with mean value between 2.50 – 3.49 was considered as Agree (A). Similarly, item having mean value between 1.50 – 2.49 was taken as Disagree (D) and item with mean value ranging between 1.00 – 1.49 was considered as Strongly Disagree (SD). For the null hypotheses, the decision was that if the calculated value of z (zcal) is equal to or greater than the critical value of z (zcrit), the null hypothesis was rejected but if the calculated value of z (zcal) is less than the critical value of z (zcrit), the null hypothesis was accepted.

Results

The results from the study were presented in Table 1 – 6 as shown below.

Research Question 1: How acquisition of electronic ignition system maintenance skills enhance employability of motor vehicle mechanic works students in Technical Colleges in Rivers State?

Table 1: Mean Responses on How Acquisition of Electronic Ignition System Skills Enhance Employability of MVM Students

S/N	Acquisition of Electronic Ignition System Skills Enhance Employability of MVM Students.	MVM Teachers			MVM Technicians		
		$\overline{X}_1$	SD1	RMK	$\overline{X}_2$	SD2	RMK
1	Identify the on-board diagnostic port in modern vehicles	3.55	0.70	SA	3.17	0.84	A
2	Connect the diagnostic device to the 16-pin on-board diagnostic connector	3.23	1.11	A	3.66	0.63	SA
3	Retrieve transmission Diagnostic Trouble Codes (DTC's)	3.96	0.66	SA	2.90	1.11	A
4	Record and print transmission diagnostic trouble codes	3.14	0.63	A	3.71	0.94	SA
5	Interpret ignition Diagnostic Trouble Codes (DTC's)	3.22	0.71	A	3.86	0.70	SA
6	Record ignition timing using digital multi-meter	3.47	0.82	A	3.33	0.63	A
7	Carry out throttle cable inspection and adjustment	3.68	0.59	SA	2.71	0.64	A
8	Check the crank sensor using diagnostic tool	3.64	0.58	SA	3.17	0.73	A
9	Perform magnetic sensor testing	2.94	0.63	A	2.89	1.11	A
10	Inspect, adjust or replace faulty crank position sensor	3.58	1.11	SA	3.14	0.86	A
11	Test and diagnose defective reflector sensor	3.08	0.84	A	3.76	0.76	SA
12	Check supply voltages and signals with multi-meter and oscilloscope	3.33	0.60	A	3.07	0.57	A
13	Use plug wire or adapter to check for spark	3.84	0.77	SA	3.68	0.83	SA
14	Conduct a careful visual inspection of the wiring and the mechanical components	3.72	0.68	SA	3.11	0.57	A
15	Check the battery to make sure there is ample voltage to start the engine	3.20	0.71	A	3.04	1.11	A
16	Inspect, repair and replace faulty electronic ignition components	3.07	1.01	A	3.68	0.63	SA
17	Conduct engine performance test using engine analyzer and determine needed repair	3.64	0.63	SA	2.79	0.67	A
18	Test run the ignition system using the multi-meter.	3.23	0.84	A	3.47	0.59	A
	Average Mean	**3.42**		**A**	**3.29**		**A**

Source: *Researcher's Field Result; 2023*

Table 1 shows how acquisition of electronic ignition system skills enhance employability of motor vehicle mechanic works students in Technical Colleges in Rivers State. The result shows that acquisition of electronic ignition system skills enhance employability as students are able to identify the on-board diagnostic port in modern vehicles, connect the diagnostic device to the 16-pin on-board diagnostic connector, retrieve transmission Diagnostic Trouble Codes (DTC's), record and print transmission diagnostic trouble codes, interpret ignition Diagnostic Trouble Codes (DTC's), record ignition timing using digital multi-meter, carry out throttle cable inspection and adjustment, check the crank sensor using diagnostic tool, perform magnetic sensor testing, inspect, adjust or replace faulty crank position sensor as well as testing and diagnosing defective reflector sensor among others.

The result shows an average mean of 3.42 and 3.29 for teachers of Motor Vehicle Mechanic trade in Technical Colleges in Rivers State and technician of Motor Vehicle Mechanic. Also, the result revealed standard deviation values of 0.76 and 0.77 for teachers of Motor Vehicle Mechanic trade in Technical Colleges in Rivers State and technician of Motor Vehicle Mechanic. Standard deviation value less than 1.00 indicates that the respondents (teachers of Motor Vehicle Mechanic trade in Technical Colleges in Rivers State and technician of Motor Vehicle Mechanic) were homogenous in their responses while standard deviation value greater than 1.00 shows that the respondents were heterogenous in response.

Research Question 2: How acquisition of electronic suspension system maintenance skills enhance employability of motor vehicle mechanic works students in Technical Colleges in Rivers State?

Table 2: Mean Responses on How Acquisition of Electronic Suspension System Skills Enhance Employability of MVM Students

S/N	Acquisition of Electronic Suspension System Skills Enhance Employability of MVM Students.	MVM Teachers			MVM Technicians		
		$\overline{X}_1$	SD_1	RMK	$\overline{X}_2$	SD_2	RMK
19	Fix shock absorber, spring and vehicle suspension arms.	3.50	0.72	SA	3.03	0.63	A
20	Retrieve suspension Diagnostic Trouble Codes (DTC)	3.17	0.91	A	3.16	1.01	A
21	Fix the lifting shaft fitted around the strut assembly.	3.69	0.59	SA	3.04	0.84	A
22	Interpret suspension Diagnostic Trouble Codes (DTC).	3.03	0.63	A	2.58	0.58	A
23	Couple the strut assembly to the vehicle body.	3.10	0.74	A	3.71	0.66	SA
24	Use pump to increase/decrease pressure in suspension dampers.	3.23	0.83	A	3.66	0.73	SA
25	Adjust the damper rate electronically to best match the suspension deflection.	3.11	0.54	A	3.16	0.80	A
26	Use sensors to monitor the height of the vehicle.	3.58	0.60	SA	3.04	0.66	A
27	Use electronic control unit (ECU) to adjust vehicle suspension system.	3.44	0.74	A	3.20	0.57	A
28	Use ECU to stiffen the suspension to reduce roll.	3.56	1.01	SA	3.97	0.91	SA
29	Use ECU to soften the suspension to give the occupants a comfortable ride.	3.60	0.56	SA	3.69	1.11	SA
30	Fix the forward-looking device to examine the road ahead and adjust the suspension in accordance with the road condition.	3.08	0.73	A	3.47	0.74	A
	Average Mean	**3.34**		**A**	**3.31**		**A**

Source: *Researcher's Field Result; 2023*

Table 2 shows how acquisition of electronic suspension system skills enhance employability of motor vehicle mechanic works students in Technical Colleges in Rivers State. The result shows that acquisition of electronic suspension system skills enhance employability as students are able to fix shock absorber, spring and vehicle suspension arms, retrieve suspension Diagnostic Trouble Codes (DTC), fix the lifting shaft fitted around the strut assembly, interpret suspension Diagnostic Trouble Codes (DTC), couple the strut assembly to the vehicle body, use pump to increase/decrease pressure in

suspension dampers, adjust the damper rate electronically to best match the suspension deflection and use sensors to monitor the height of the vehicle among others.

The result shows an average mean of 3.34 and 3.31 for teachers of Motor Vehicle Mechanic trade in Technical Colleges in Rivers State and technician of Motor Vehicle Mechanic. Also, the result revealed standard deviation values of 0.72 and 0.77 for teachers of Motor Vehicle Mechanic trade in Technical Colleges in Rivers State and technician of Motor Vehicle Mechanic. Standard deviation value less than 1.00 indicates that the respondents (teachers of Motor Vehicle Mechanic trade in Technical Colleges in Rivers State and technician of Motor Vehicle Mechanic) were homogenous in their responses while standard deviation value greater than 1.00 shows that the respondents were heterogenous in response.

Research Question 3: How acquisition of On-Board Diagnosis system maintenance skills enhance employability of motor vehicle mechanic works students in Technical Colleges in Rivers State?

Table 3: Mean Responses on How Acquisition of On-Board Diagnosis System Maintenance Skills Enhance Employability of MVM Students

S/N	Acquisition of On-Board Diagnosis System Maintenance Skills Enhance Employability of MVM Students.	MVM Teachers			MVM Technicians		
		$\overline{X}_1$	SD_1	RMK	$\overline{X}_2$	SD_2	RMK
31	Identify the on-board diagnostic port in modern vehicles.	3.98	1.01	SA	3.33	0.84	A
32	Connect the diagnostic device to on-board diagnostic connector.	3.14	0.91	A	3.14	0.71	A
33	Retrieve Diagnostic Trouble Codes (DTC) from OBD equipment.	3.66	0.58	SA	3.02	0.63	A
34	Record/print diagnostic trouble codes from OBD equipment.	3.21	0.70	A	3.71	1.11	SA
35	Interpret Diagnostic Trouble Codes from (DTC).	3.02	1.11	A	2.97	0.58	A
36	Identify various types of OBD equipment.	3.17	0.96	A	3.47	0.64	A
37	Use appropriate OBD test equipment effectively.	3.89	0.80	SA	2.69	0.71	A
38	Work with personal computer effectively.	3.87	0.77	SA	3.80	1.01	SA
39	Work in a safe manner to avoid damage to electronic components.	3.79	0.63	SA	3.15	0.58	A
40	Read and interpret computer program like Vehicle Explorer.	3.17	1.01	A	3.66	0.77	SA
41	Translate Data Link Connector (DLC) signal into readable format.	2.84	0.68	A	3.74	0.53	SA
42	Use vehicle explorer program to monitor sensor signals in both numerical and graphical formats.	3.01	0.74	A	3.25	0.67	A
	Average Mean/SD	**3.40**		**A**	**3.33**		**A**

Source: *Researcher's Field Result; 2023*

Table 3 shows how acquisition of On-Board Diagnosis system maintenance skills enhance employability of motor vehicle mechanic works students in Technical Colleges

in Rivers State. The result shows that acquisition of On-Board Diagnosis system maintenance skills enhance employability as students are able to connect the diagnostic device to on-board diagnostic connector, interpret Diagnostic Trouble Codes from (DTC), work in a safe manner to avoid damage to electronic components, use appropriate OBD test equipment effectively, identify the on-board diagnostic port in modern vehicles, retrieve Diagnostic Trouble Codes (DTC) from OBD equipment, Identify various types of OBD equipment, record/print diagnostic trouble codes from OBD equipment, read and interpret computer program like Vehicle Explorer and working with personal computer effectively and so on.

The result shows an average mean of 3.40 and 3.33 for teachers of Motor Vehicle Mechanic trade in Technical Colleges in Rivers State and technician of Motor Vehicle Mechanic. Also, the result revealed standard deviation values of 0.83 and 0.73 for teachers of Motor Vehicle Mechanic trade in Technical Colleges in Rivers State and technician of Motor Vehicle Mechanic. Standard deviation value less than 1.00 indicates that the respondents (teachers of Motor Vehicle Mechanic trade in Technical Colleges in Rivers State and technician of Motor Vehicle Mechanic) were homogenous in their responses while standard deviation value greater than 1.00 shows that the respondents were heterogenous in response.

Statistical Test of Hypotheses

The following null hypotheses were formulated and tested at 0.05 level of significance to guide the study.

Hypothesis 1: There is no significance difference in the mean response of Motor Vehicle Mechanic Works teachers and Motor Vehicle Mechanic technician on how acquisition of electronic ignition system maintenance skills enhance employability of motor vehicle mechanic works students in Technical Colleges in Rivers State.

Table 4: z-Test Analysis on How Acquisition of Electronic Ignition System Maintenance Skills Enhance Employability of Motor Vehicle Mechanic Works Students in Technical Colleges, Rivers State

Groups	$\overrightarrow{X}$	SD	N	df	α	zcal	zcrit	Remark
MVM Teachers	3.42	0.76	13					
				102	0.05	0.56	1.96	Accepted
MVM Technician	3.29	0.77	91					

Source: *Researcher's Field Result; 2023* Accept Ho if zcal ≤ zcrit, otherwise reject.

Result from Table 4 revealed that the calculated value of z (zcal = 0.56) is less than the critical value of z (zcrit = 1.96), the null hypothesis is accepted. This implies that there is no significance difference in the mean response of Motor Vehicle Mechanic Works teachers and Motor Vehicle Mechanic technician on how acquisition of electronic ignition system maintenance skills enhance employability of motor vehicle mechanic works students in Technical Colleges in Rivers State.

Hypothesis 2: There is no significance difference in the mean response of Motor Vehicle Mechanic Works teachers and Motor Vehicle Mechanic technician on how acquisition of electronic suspension system maintenance skills enhance employability of motor vehicle mechanic works students in Technical Colleges in Rivers State.

Table 5: z-Test Analysis on How Acquisition of Electronic Suspension System Maintenance Skills Enhance Employability of Motor Vehicle Mechanic Works Students in Technical Colleges, Rivers State

Groups	$\vec{X}$	SD	N	df	α	zcal	zcrit	Remark
MVM Teachers	3.34	0.72	13					
				102	0.05	0.13	1.96	Accepted
MVM Technician	3.31	0.77	91					

Source: *Researcher's Field Result; 2023* Accept Ho if zcal ≤ zcrit, otherwise reject.

Result from Table 5 revealed that the calculated value of z (zcal = 0.13) is less than the critical value of z (zcrit = 1.96), the null hypothesis is accepted. This implies that there is no significance difference in the mean response of Motor Vehicle Mechanic Works teachers and Motor Vehicle Mechanic technician on how acquisition of electronic suspension system maintenance skills enhance employability of motor vehicle mechanic works students in Technical Colleges in Rivers State.

Hypothesis 3: There is no significance difference in the mean response of Motor Vehicle Mechanic Works teachers and Motor Vehicle Mechanic technician on how acquisition of On-Board Diagnosis maintenance skills enhance employability of motor vehicle mechanic works students in Technical Colleges in Rivers State.

Table 6: z-Test Analysis on How Acquisition of Electronic Suspension System Maintenance Skills Enhance Employability of Motor Vehicle Mechanic Works Students in Technical Colleges, Rivers State

Groups	$\vec{X}$	SD	N	df	α	zcal	zcrit	Remark
MVM Teachers	3.40	0.83	13					
				102	0.05	0.28	1.96	Accepted
MVM Technician	3.33	0.73	91					

Source: *Researcher's Field Result; 2023* Accept Ho if zcal ≤ zcrit, otherwise reject.

Result from Table 6 revealed that the calculated value of z (zcal = 0.28) is less than the critical value of z (zcrit = 1.96), the null hypothesis is accepted. This implies that there is no significance difference in the mean response of Motor Vehicle Mechanic Works teachers and Motor Vehicle Mechanic technician on how acquisition of On-Board Diagnosis maintenance skills enhance employability of motor vehicle mechanic works students in Technical Colleges in Rivers State.

Discussion of Findings

Result from Table 1 shows how acquisition of electronic ignition system skills enhance employability of motor vehicle mechanic works students in Technical Colleges in Rivers State. The result revealed that acquisition of electronic ignition system skills enhance employability as students are able to identify the on-board diagnostic port in modern vehicles, connect the diagnostic device to the 16-pin on-board diagnostic connector, retrieve transmission Diagnostic Trouble Codes (DTC's), record and print transmission diagnostic trouble codes, interpret ignition Diagnostic Trouble Codes (DTC's), record ignition timing using digital multi-meter, carry out throttle cable inspection and adjustment, check the crank sensor using diagnostic tool, perform magnetic sensor testing, inspect, adjust or replace faulty crank position sensor as well as testing and diagnosing defective

reflector sensor among others. The finding of this study is in line with that of Umurhurhu (2019) who asserts that ignition systems of modern automobile vehicles are based on electronic control system which requires skills in reading and interpreting electronic control module sensors of the various ignition system and modernized electronic control unit. The findings of study also agree with that of Wilcox (2013) who showed that electronic ignition control skills like ability to perform magnetic sensor testing, test run the ignition system using the multi-meter and conduct a careful visual inspection of the electronic ignition wiring system. Wilcox `s findings is therefore supporting the findings of the study.

Result from Table 2 shows how acquisition of electronic suspension system skills enhance employability of motor vehicle mechanic works students in Technical Colleges in Rivers State. The result revealed that acquisition of electronic suspension system skills enhance employability as students are able to fix shock absorber, spring and vehicle suspension arms, retrieve suspension Diagnostic Trouble Codes (DTC), fix the lifting shaft fitted around the strut assembly, interpret suspension Diagnostic Trouble Codes (DTC), couple the strut assembly to the vehicle body, use pump to increase/decrease pressure in suspension dampers, adjust the damper rate electronically to best match the suspension deflection and use sensors to monitor the height of the vehicle among others. The finding of this study is in line with that of Mbah (2016) that automobile craftsmen in informal automobile workshops need skills in scan tool, reading/interpreting the codes/ trouble shooting using the scan tool and providing solution to the problematic system through the result of the scan tool.

Result from Table 3 shows how acquisition of On-Board Diagnosis system maintenance skills enhance employability of motor vehicle mechanic works students in Technical Colleges in Rivers State. The result revealed that acquisition of On-Board Diagnosis system maintenance skills enhance employability as students are able to connect the diagnostic device to on-board diagnostic connector, interpret Diagnostic Trouble Codes from (DTC), work in a safe manner to avoid damage to electronic components, use appropriate OBD test equipment effectively, identify the on-board diagnostic port in modern vehicles, retrieve Diagnostic Trouble Codes (DTC) from OBD equipment, Identify various types of OBD equipment, record/print diagnostic trouble codes from OBD equipment, read and interpret computer program like Vehicle Explorer and working with personal computer effectively and so on.. The finding of this study is in line with that of Umurhurhu (2019) as pointed out that the maintenance of this electronic system requires the technician to acquire skills in on-board diagnostic system such as coding of the system, inspecting, adjusting and replacement of faulty sensors in the system.

Conclusion

Based on the findings of the study, it was concluded that acquisition of autotronics maintenance skills enhance employability of motor vehicle mechanic works students in Technical Colleges in Rivers State. These autotronic maintenance skills if acquired could enhance employability of motor vehicle mechanic works students include electronic ignition system skills such as identifying the on-board diagnostic port in modern vehicles, connect the diagnostic device to the 16-pin on-board diagnostic connector and retrieve transmission Diagnostic Trouble Codes (DTC's). Electronic suspension system skills such as fixing shock absorber, spring and vehicle suspension arms, retrieve suspension Diagnostic Trouble Codes (DTC), fixing the lifting shaft fitted around the strut assembly

and interpret suspension Diagnostic Trouble Codes (DTC) and couple the strut assembly to the vehicle body. Others include On-Board Diagnosis system maintenance skills which include connecting the diagnostic device to on-board diagnostic connector, interpret Diagnostic Trouble Codes from (DTC) and identify the on-board diagnostic port in modern vehicles, retrieve Diagnostic Trouble Codes (DTC) from OBD equipment.

Recommendations

Based on the findings of the study, the follow recommendations were made.

1. Electronic ignition system maintenance skills should be integrated in instructional delivery of motor vehicle mechanics trade by National Board for Technical Education because acquisition of these skills will make students to be effective in maintaining modern vehicles and enhance employability.
2. The National Board for Technical Education (NBTE) should integrate electronic suspension system maintenance skills as autotronic skills in instructional delivery of motor vehicle mechanics trade as acquisition of these skills will enhance employability of students.
3. Students of motor vehicle mechanic trade should be trained on On-Board Diagnosis system skills as autotronic maintenance skills through instructional delivery as this will make students to be effective in maintaining modern vehicles and enhance employability.

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