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

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Abstract: *The study examined the integration of autotronics maintenance skills in instructional delivery 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 "Autotronics Skills in Instructional Delivery for Students' 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 0.84, 0.80 and 0.85 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 integration of autotronic maintenance skills such as electronic power steering skills, electronic braking system skills and electronic automatic transmission system skills in instructional delivery 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 the National Board for Technical Education should integrate electronic power steering skills as autotronic skills in instructional delivery of motor vehicle mechanics trade for enhance employability of students. The National Board for Technical Education should integrate electronic braking system skills as autotronic skills in instructional delivery of motor vehicle mechanics trade for enhance employability of students and that students of motor vehicle mechanic trade should be trained on electronic automatic transmission system skills as autotronic skills through instructional delivery for enhance employability.*

Keywords: *Integration, Autotronics, Maintenance Skills, Instructional Delivery and Employability*

Introduction

In Nigeria, a rapidly developing country, the imperative for educational institutions to cultivate craftsmen and master craftsmen possessing job-relevant skills and competence is a significant concern for employers. These pivotal contributors to the workforce are predominantly trained at Technical Colleges, which represent the post-basic school level within Nigeria's vocational

education system. Established with the explicit aim of producing craftsmen and master craftsmen, Technical Colleges are designed to equip students with the skills necessary for various occupations, thereby preparing them for the demands of the workplace.

The curriculum of Technical Colleges, as stipulated by the Federal Republic of Nigeria (FRN, 2013), is structured to facilitate the graduation of students who are either readily employable in industry or capable of self-employment. To achieve this objective, the 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).

The MVMWs program is meticulously structured to prepare individuals for specific occupations, be it as semi-skilled or skilled workers, technicians, or sub-professionals, within recognized or emerging occupations, or to facilitate their enrollment in advanced Technical Education programs, as articulated by Ugwaja (2010). Consequently, students enrolled in motor vehicle mechanic works are expected to acquire a diverse array of skills and abilities, including an aptitude for automotive and electronic systems, problem-solving capabilities, keen sensory acuity, manual dexterity, mechanical aptitude, effective communication skills in English, physical fitness, driving proficiency across various vehicles, and the ability to interpret technical diagrams and illustrations.

Moreover, students are instilled with a commitment to safety, a responsible work ethic, and a penchant for staying abreast of technological advancements. Essentially, the Motor Vehicle Mechanic Works trade within Government Technical Colleges is designed to furnish students with both theoretical knowledge and practical skills, thereby enhancing their employability prospects upon acquiring the requisite skills in vehicle servicing and maintenance. Graduates are thus empowered to secure gainful employment, establish their 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). Auto mechanics craftsmen must possess the ability to diagnose and rectify faults in both conventional and electronically controlled systems, emphasizing the importance of integrating autotronic skills into technical education curricula. Accordingly, motor vehicle mechanic work instructors should employ instructional methods aligned with industry needs to equip students with contemporary skills required for employability.

Skill acquisition entails deliberate, sustained effort to execute complex tasks proficiently, encompassing cognitive, technical, and interpersonal domains (Robinson as cited in Omar, Bakar & Rashid, 2012). Technical skills, specifically, encompass the knowledge and abilities essential for technological tasks, such as mathematical, engineering, or computer-related duties. In the context of this study, 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.

In light of these developments, the integration of autotronic skills into instructional delivery becomes paramount for enhancing the employability of motor vehicle mechanic works students in Technical Colleges across Rivers State, Nigeria. This integration ensures that students are equipped with the requisite competencies to navigate the evolving landscape of automotive technology, thereby bolstering their prospects in the job market.

Statement of the Problem

The introduction of the motor vehicle and maintenance work trade within Technical Colleges, as outlined by the Federal Republic of Nigeria (2013) in its revised form, aims to equip individuals with entrepreneurial, technical, and vocational skills tailored to specific job roles, fostering self-reliance. Historically, motor vehicle mechanic students were 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.

However, the researchers highlight that advancements in science and technology have gradually rendered many motor vehicle maintenance skills taught in Technical Colleges obsolete. Consequently, graduates often lack the requisite skills 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. Similarly, Nna (2011) notes 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 such as On-Board Diagnose instruments.

This discrepancy arises from Technical Colleges continuing to operate with outdated curricula that fail to incorporate the essential autotronic maintenance skills required for servicing contemporary equipment and vehicles. Addressing this issue necessitates revising instructional delivery methods to align with the evolving technological landscape. For teachers of Motor Vehicle Mechanic Works, integrating autotronic maintenance skills into the course content is imperative to enhance the employability of graduates in modern technological industries. It is against this backdrop, that this study aims to examine the integration of autotronics maintenance skills into instructional delivery to enhance the employability of motor vehicle mechanic works students in Technical Colleges across Rivers State, Nigeria.

Purpose of the Study

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

1. Electronic power steering maintenance skills in instructional delivery enhance employability of motor vehicle mechanic works students in Technical Colleges in Rivers State, Nigeria.
2. Electronic braking system maintenance skills in instructional delivery enhance employability of motor vehicle mechanic works students in Technical Colleges in Rivers State, Nigeria.
3. Electronic automatic transmission system maintenance skills in instructional delivery enhance employability of motor vehicle mechanic works students in Technical Colleges in Rivers State, Nigeria.

Research Questions

The following research questions were answered in the study.

1. How would integration of electronic power steering maintenance skills in instructional delivery enhance employability of motor vehicle mechanic works students in Technical Colleges in Rivers State, Nigeria?
2. How would integration of electronic braking system maintenance skills in instructional delivery enhance employability of motor vehicle mechanic works students in Technical Colleges in Rivers State, Nigeria?
3. How would integration of electronic automatic transmission system maintenance skills in instructional delivery enhance employability of motor vehicle mechanic works students in Technical Colleges in Rivers State, Nigeria?

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 integration of power steering maintenance skills in instructional delivery enhance employability of motor vehicle mechanic works students in Technical Colleges in Rivers State, Nigeria.
2. There is no significance difference in the mean response of Motor Vehicle Mechanic Works teachers and Motor Vehicle Mechanic technician on how integration of braking system maintenance skills in instructional delivery enhance employability of motor vehicle mechanic works students in Technical Colleges in Rivers State, Nigeria.
3. There is no significance difference in the mean response of Motor Vehicle Mechanic Works teachers and Motor Vehicle Mechanic technician on how integration of automatic transmission system maintenance skills in instructional delivery enhance employability of motor vehicle mechanic works students in Technical Colleges in Rivers State, Nigeria.

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 "Autotronics Maintenance Skills in Instructional Delivery for Students' Employability Questionnaire" (AMSIDSEQ) 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 0.84, 0.80 and 0.85 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 would integration of electronic power steering skills in instructional delivery enhance employability of motor vehicle mechanic works students in Technical Colleges in Rivers State?

Table 1: Mean Responses on How Integration of Electronic Power Steering Skills in Instructional Delivery Enhance Employability of MVM Students

S/N	Integration of Electronic Power Steering Skills in Instructional Delivery for Enhance Employability of MVM Students.	MVM Teachers			MVM Technicians		
		$\overline{X}_1$	SD_1	RMK	$\overline{X}_2$	SD_2	RMK
1.	Replace deformable steering wheel and collapsible steering column.	3.63	0.80	SA	3.55	0.73	SA
2.	Inspect and adjust the steer-by-wire systems.	3.74	1.11	SA	3.06	0.80	A
3.	Replace torque sensors for EPS system.	3.58	1.02	SA	3.70	1.01	SA
4.	Inspect and adjust angular position and speed sensors.	3.13	0.77	A	2.96	0.75	A
5.	Fix the actuators for electric power steering.	2.96	0.67	A	3.33	0.60	A
6.	Diagnose electronic EPS System Controller failures.	3.48	0.71	A	3.86	1.11	SA
7.	Inspect and replace faulty strain gauge sensors.	3.84	0.66	SA	3.05	0.56	A
8.	Adjust and replace the rack and pinion of the steering mechanism.	3.22	1.01	A	3.11	0.74	A
9.	Interpret the control algorithm signals that drive the electric motor to provide steering assistance.	3.05	0.58	A	3.02	0.63	A
10	Replace steering wheel torque sensor.	3.23	0.74	A	3.70	1.01	SA
	Average Mean	**3.39**		**A**	**3.33**		**A**

Source: *Researcher's Field Result; 2023*

Table 1 shows how integration of electronic power steering skills in instructional delivery enhance employability of motor vehicle mechanic works students in Technical Colleges in Rivers State. The result shows that integration of electronic power steering skills in instructional delivery makes students to able to replace steering wheel torque sensor, inspect and adjust angular position and speed sensors, replace torque sensors for EPS system, diagnose electronic EPS System Controller failures, replace deformable steering wheel and collapsible steering column and to fix the

actuators for electric power steering among others which enhance employability of motor vehicle mechanic works students in Technical Colleges in Rivers State.

The result shows an average mean of 3.39 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 0.81 and 0.79 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 would integration of electronic braking system skills in instructional delivery enhance employability of motor vehicle mechanic works students in Technical Colleges in Rivers State?

Table 2: Mean Responses on how Integration of Electronic Braking System Skills in Instructional Delivery Enhance Employability of MVM Students

S/N	Integration of Electronic Braking System Skills in Instructional Delivery for Enhance Employability of MVM Students.	MVM Teachers			MVM Technicians		
		$\overline{X}_1$	SD_1	RMK	$\overline{X}_2$	SD_2	RMK
11	Verify and adjust wheel speed sensors.	3.33	0.83	A	3.62	0.71	SA
12	Verify power supply of wheel sensor thoroughly.	3.68	0.94	SA	3.44	0.60	A
13	Identify faulty wheel sensor.	3.41	1.02	A	3.30	1.11	A
14	Test drive to check wheel speed sensor after adjustment.	3.86	0.53	SA	3.17	0.88	A
15	Replace electrical wires linking the wheel speed sensor and the brake pedal when faulty.	3.82	0.81	SA	3.50	0.70	SA
16	Inspect wire coupling to electronic brake components.	3.12	0.63	A	3.14	0.57	A
17	Retrieve braking fault codes from the OBD system tools.	3.37	0.70	A	2.94	0.80	A
18	Identify the tools for fixing and servicing of EBS.	3.24	0.72	A	3.37	0.71	A
19	Recalibrate the speed sensors.	2.86	1.11	A	3.01	0.66	A
20	Check the service manual for the voltage and resistance values on various pins and sensors.	3.05	0.60	A	3.22	1.01	A

21	Consult the service manual for a chart of specific values of electronic components.	3.84	0.58	SA	3.57	0.62	SA
22	Manually clean the brakes on the car.	3.66	1.01	SA	3.97	0.71	SA
23	Inflate vehicle tyres and adjust its pressure.	3.41	0.71	A	3.68	1.11	SA
24	Install new EBS Control Module unit.	3.77	0.84	SA	3.08	0.71	A
	Average Mean	**3.46**		**A**	**3.36**		**A**

Source: *Researcher's Field Result; 2023*

Table 2 shows how integration of electronic braking system skills in instructional delivery enhance employability of motor vehicle mechanic works students in Technical Colleges in Rivers State. The result shows that integration of electronic braking system skills in instructional delivery makes students to able to replace electrical wires linking the wheel speed sensor and the brake pedal when faulty, check the service manual for the voltage and resistance values on various pins and sensors, retrieve braking fault codes from the OBD system tools, verify and adjust wheel speed sensors, identify faulty wheel sensor, identify the tools for fixing and servicing of EBS, inflate vehicle tyres and adjust its pressure and consult the service manual for a chart of specific values of electronic components among others which enhance employability of motor vehicle mechanic works students in Technical Colleges in Rivers State.

The result shows an average mean of 3.46 and 3.36 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 0.79 and 0.78 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 would integration of electronic automatic transmission system skills in instructional delivery enhance employability of motor vehicle mechanic works students in Technical Colleges in Rivers State?

Table 3: Mean Responses on how Integration of Electronic Automatic Transmission System Skills in Instructional Delivery Enhance Employability of MVM Students

S/N	Integration of Electronic Automatic Transmission System (EATS) Skills in Instructional Delivery for Enhance Employability of MVM Students.	MVM Teachers $\bar{X}_1$	SD₁	RMK	MVM Technicians $\bar{X}_2$	SD₂	RMK
25	Retrieve transmission Diagnostic Trouble Codes (DTC)	3.63	0.73	SA	3.07	0.71	A
26	Record and print transmission Diagnostic Trouble Codes	3.70	0.87	SA	3.23	1.11	A

27	Identify defective input shaft speed sensor.	3.05	0.69	A	3.83	1.01	SA
28	Check the electronic control unit.	3.33	0.54	A	3.41	0.57	A
29	Conduct visual inspection on transmission linkage adjustments.	3.50	1.03	SA	3.67	0.63	SA
30	Inspect wire coupling to braking components.	3.05	0.77	A	3.80	0.71	SA
31	Inspect disassembled transmission to diagnose vibration problems.	2.84	0.63	A	3.66	0.84	SA
32	Inspect transmission wiring harness for tears and other damages.	3.17	0.58	A	3.07	0.53	A
33	Check and replace leaking or damaged torque converter.	3.86	0.80	SA	2.68	0.60	A
34	Replace electronic wires linking the wheel speed sensor and the brake pedal when faulty.	3.70	1.11	SA	3.73	1.02	SA
35	Replace rubber seals, O-rings and friction discs, as part of electronic automatic transmission overhaul.	3.11	0.60	A	3.94	0.74	SA
36	Flush/check transmission cooler for proper flow whenever the automatic transmission/transaxle is replaced.	3.26	1.01	A	3.25	0.83	A
37	Verify power supply of wheel sensor thoroughly.	3.08	0.71	A	3.03	0.55	A
38	Replace broken fluid line and fittings.	3.88	0.68	SA	3.48	0.64	A
	Average Mean	**3.37**		**A**	**3.42**		**A**

Source: *Researcher's Field Result; 2023*

Table 3 shows how integration of electronic automatic transmission system skills in instructional delivery enhance employability of motor vehicle mechanic works students in Technical Colleges in Rivers State. The result shows that integration of electronic automatic transmission system skills in instructional delivery makes students to able to verify power supply of wheel sensor thoroughly, retrieve transmission Diagnostic Trouble Codes (DTC), identify defective input shaft speed sensor, inspect wire coupling to braking components, check and replace leaking or damaged torque converter, inspect disassembled transmission to diagnose vibration problems, replace rubber seals, O-rings and friction discs, as part of electronic automatic transmission overhaul, record and print transmission Diagnostic Trouble Codes, check the electronic control unit among others which enhance employability of motor vehicle mechanic works students in Technical Colleges in Rivers State.

The result shows an average mean of 3.37 and 3.42 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 0.77 and 0.75 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 integration of power steering skills in instructional delivery enhance employability of motor vehicle mechanic works students in Technical Colleges, Rivers State.

Table 4: z-Test Analysis on How Integration of Power Steering Skills in Instructional Delivery 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	3.39	0.81	13					
				102	0.05	0.24	1.96	Accepted
MVM Technician	3.33	0.79	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 = 0.24) 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 integration of power steering skills in instructional delivery enhance employability of motor vehicle mechanic works students in Technical Colleges, 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 integration of braking system skills in instructional delivery enhance employability of motor vehicle mechanic works students in Technical Colleges, Rivers State.

Table 5: z-Test Analysis on How Integration of Braking System Skills in Instructional Delivery 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	3.46	0.79	13					
				102	0.05	0.41	1.96	Accepted
MVM Technician	3.36	0.78	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 = 0.41) 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 integration of electronic braking system skills in instructional

delivery enhance employability of motor vehicle mechanic works students in Technical Colleges, 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 integration of electronic automatic transmission system skills in instructional delivery enhance employability of motor vehicle mechanic works students in Technical Colleges, Rivers State.

Table 6: z-Test Analysis on How Integration of Electronic Automatic Transmission System Skills in Instructional Delivery 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	3.37	0.77	13					
				102	0.05	-0.21	1.96	Accepted
MVM Technician	3.42	0.75	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 = -0.21) 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 integration of electronic automatic transmission system skills in instructional delivery enhance employability of motor vehicle mechanic works students in Technical Colleges, Rivers State.

Discussion of Findings

Result from Table 1 shows how integration of electronic power steering skills in instructional delivery enhance employability of motor vehicle mechanic works students in Technical Colleges in Rivers State. The result revealed that integration of electronic power steering skills in instructional delivery makes students to able to replace steering wheel torque sensor, inspect and adjust angular position and speed sensors, replace torque sensors for EPS system, diagnose electronic EPS System Controller failures, replace deformable steering wheel and collapsible steering column and to fix the actuators for electric power steering among others which enhance employability of motor vehicle mechanic works students in Technical Colleges in Rivers State. The finding of this study is in corroboration with Ezeama, Oguejiofor and Uzoejinwa (2016) whose study posited that autotronic skills are required in the designing and fixing of the automotive electronic controls such as replace torque sensors for EPS system, diagnose electronic EPS System Controller failures. The present finding is further supported by Soni (2018) who maintained that autotronic skills are required to effectively make use or design, diagnose, fix and carry out maintenance services on the automotive innovated vehicles.

Result from Table 2 shows how integration of electronic braking system skills in instructional delivery enhance employability of motor vehicle mechanic works students in Technical Colleges in Rivers State. The result reveled that integration of electronic braking system skills in instructional delivery makes students to able to replace electrical wires linking the wheel speed sensor and the brake pedal when faulty, check the service manual for the voltage and resistance values on various pins and sensors, retrieve braking fault codes from the OBD system tools, verify

and adjust wheel speed sensors, identify faulty wheel sensor, identify the tools for fixing and servicing of EBS, inflate vehicle tyres and adjust its pressure and consult the service manual for a chart of specific values of electronic components among others which enhance employability of motor vehicle mechanic works students in Technical Colleges in Rivers State. The finding of this study agrees with that of Saue, Bassey, Nnadi, and Onyeaju (2023) who found that autotronic technology skills include diagnosing damage to Park Assist Control System (PACS), identifying, diagnosing, analyze symptoms unit components, repairing damage, taking care of Hybrid Powertrain System (HPS), identifying, diagnosing, analyze symptoms unit components, repairing damage, taking care of Electric Vehicle Powertrain System (EVPS) and identifying unit components and functions of Electronic Control Pedal Adjusment System (ECPAS) among others.

Result from Table 3 shows how integration of electronic automatic transmission system skills in instructional delivery enhance employability of motor vehicle mechanic works students in Technical Colleges in Rivers State. The result revealed that integration of electronic automatic transmission system skills in instructional delivery makes students to able to verify power supply of wheel sensor thoroughly, retrieve transmission Diagnostic Trouble Codes (DTC), identify defective input shaft speed sensor, inspect wire coupling to braking components, check and replace leaking or damaged torque converter, inspect disassembled transmission to diagnose vibration problems, replace rubber seals, O-rings and friction discs, as part of electronic automatic transmission overhaul, record and print transmission Diagnostic Trouble Codes, check the electronic control unit among others which enhance employability of motor vehicle mechanic works students in Technical Colleges in Rivers State. The finding of this study is corroborated by that of Erjavec (2010) who stated that automobile technicians need the technical skills in order to diagnose transmission problems such as checking the various linkage adjustments, oil and filter changes, conducting a thorough visual inspection, retrieving all Diagnostic Trouble Codes, using the On-Board Diagnostics (OBD) and checking basic engine operations.

Conclusion

Based on the findings of the study, it was concluded that integration of autotronics maintenance skills in instructional delivery enhance employability of motor vehicle mechanic works students in Technical Colleges in Rivers State. These autotronic maintenance skills integrated in instructional delivery to enhance employability of motor vehicle mechanic works students include electronic power steering skills such as replacing torque sensors for EPS system, inspecting and adjusting the steer-by-wire systems; electronic braking system such as recalibrating the speed sensors, identifying faulty wheel sensor, installing new EBS control module unit and electronic automatic transmission system skills such as check the electronic control unit, replacing broken fluid line and fittings; ignition system skills, lubrication system skills, electronic suspension system skills and On-Board Diagnosis system skills such as interpreting Diagnostic Trouble Codes from (DTC) and to translate Data Link Connector (DLC) signal into readable format.

Recommendations

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

1. The National Board for Technical Education (NBTE) should integrate electronic power steering skills as autotronic maintenance skills in instructional delivery of motor vehicle mechanics trade as acquisition of these skills will enhance employability of students.
2. The National Board for Technical Education (NBTE) should integrate electronic braking

system skills as autotronic maintenance skills in instructional delivery of motor vehicle mechanics trade for enhance employability of students as this will make students to be effective in maintaining modern vehicles and improve employability.

3. Students of motor vehicle mechanic trade should be trained on electronic automatic transmission system maintenance skills as autotronic maintenance skills through instructional delivery for enhance employability.

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