

Impact of Organization and Administration of Motor Vehicle Mechanics Work Workshop for Improving Skill Acquisition

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Abstract— The study aims to investigate the organization and administration of the Motor Vehicle Mechanics Work (MVMW) Workshop in Government Science and Technical Colleges in Gombe State, Nigeria, focusing on improving student skill acquisition. The study, which had two research questions and hypotheses, adopted a descriptive survey research design, and the study population comprised 42 administrators (principals, vice principals, senior masters and mistresses, and MVMW Head of Departments) and 21 MVMW teachers, making a total of 63 respondents. Whole population sampling was adopted for the study. A researcher-developed questionnaire collects data, with responses rated on a Likert scale. Descriptive statistics, such as mean and standard deviation, were employed to answer research questions, and a t-test was used to test hypotheses. The findings reveal that the organizational and administrative structures significantly impact skill acquisition in the MVMW Workshop. Administrators and teachers agree on the positive effects of these structures. Recommendations are proposed, emphasizing the need for well-designed organizational layouts, effective administrative systems, and collaborative efforts between administrators and teachers to optimize workshop functionality and enhance student skill development.

Keywords—Motor Vehicle, Mechanics Work, Workshop, Skill Acquisition, Technical Colleges

I. INTRODUCTION

Motor Vehicle Mechanics Work (MVMW) aims to enable graduates to test, diagnose, Service, and repair any fault relating to conventional motor vehicle central assembly units and systems to the manufacturer's specification [1]. MVMW students need the following attributes: an interest in mechanical/electronic systems in motor vehicles, good problem-solving ability, good vision, good hearing and smell sense, manual dexterity and mechanical aptitude, physical fitness and strength, ability to drive range of vehicles, ability to read technical diagrams and illustrations, also have concern for safety and responsible work attitude; and keeping up to date with current technology [2]. MVMW in technical colleges requires practical workshops categorized into three units: Service Station Mechanics Work, Engine Maintenance and Refurbishing, and Auto Electricity.

According to Ref. [3], a workshop is an area, room, or building where tools, workbenches, equipment, machines, and materials are used for manufacturing or repair. Hence, the MVMW Workshop is a designated place, room, or hall where workbenches, mechanical toolboxes, other essential vehicle services, and repair equipment are used to improve workshop

practices continually. Improving in this respect means bringing more desirable or excellent conditions. However, improving is the increasing capabilities of staff and facilities with access to education and training opportunities in the workplace, through outside organizations, or through watching others perform the job (onlinedictionary.com). Therefore, improving the MVMW Workshop is necessary for enhancing effective organization and administration.

Organization and administration of workshop facilities enhance skill acquisition. However, engaging the students in demonstrations and practices helps to build their pedagogy skills. Therefore, acquired skill in any discipline assumes the future of students' performances and is of greater importance in productivity [4], [5]. Organization is the process of forming the structure of tasks and allocating tasks to individuals to perform in order to achieve organizational goals [6], [7]. By so doing, no task will remain undone. The duty of the MVMW Head of Department calls for allocating tasks to workshop personnel students to carry out projects.

Hence, the organizing role of the Head of Department involves encouraging teachers to make arrangements and develop orderly structures that combine all elements in MVMW Workshop processes into a unified whole, while organizing is closely associated with systematic MVMW Workshop Planning. Organizing the workshop environment is an aspect of administration.

Administration is the activity that maintains the organization and concerns the direction of the activities of the people working within the organization in their reciprocal relation to the goal of attaining the organization's purposes [8], [9]. Similarly, Ref. [10] noted that management as an administration aspect is a process used to achieve specific goals by utilizing resources (people, money, energy, materials, space, and time). From these two definitions, Ref. [11] opined that one can see that the distinction between the two concepts is blurred. It is a blur in that they all aim to use resources to achieve organizational goals. For that reason, they will be used interchangeably. However, people use them differently regarding the organization they describe. For example, management is more appropriate to business and industry while administration to educational institutions.

Workshop Management is successful upon full achievement of workshop objectives. Good workshop management techniques enable students to exercise practical skills through self-control in adhering to rules and influence students' time in meaningful learning [12]. Teachers, with the

rest of the workshop personnel, ensure proper records keeping, care of materials supplied, tools and equipment maintenance, and accident prevention through proper organization.

Technical College Facilities must be appropriately organized and administrated scientifically to make the educational system more effective and functional than the local apprenticeship system. The type of training to be given to students in the technical training institutions cannot survive without functional workshop tools [13]. There has been an increasing emphasis on developing Technical Colleges in Nigeria. Industrialization cannot be initiated appropriately and sustained unless the educational system is geared toward supplying the industries with the requisite manpower.

A. Statement of the Problem

MVMW Workshops need personnel, lessons classes, spatial arrangements for practicals, offices, stores, workshop bays, etc. It is worrisome that some objectives of Technical Education will be defeated if the MVMW Workshop and/or activities are not properly organized and administrated. In line with foreseeing facility organization and administration, the program should be intensified to anticipate human/facility problems rather than reacting to them when they occur. This prompted the researcher to embark on this study of the impact of the organization and administration of the Motor Vehicle Mechanics Works (MVMW) workshop for improving skill acquisition in Gombe State Government Science and Technical Colleges.

B. Purpose of the Study

The study aims to identify the organization and administration of the Motor Vehicle Mechanics Work (MVMW) Workshop for improving skill acquisition in Gombe State Government Science and Technical Colleges. Specifically, the study intends to:

1. Determine the extent of the organizational structure of MVMW Workshop, which affects skill acquisition among Government Science and Technical Colleges students in Gombe State.
2. Determine the effectiveness of the administrative structure of MVMW Workshop on skill acquisition among Government Science and Technical Colleges students in Gombe State.

C. Research Questions

1. To what extent does the organizational structure of MVMW Workshop affect skill acquisition among Government Science and Technical Colleges students in Gombe State?
2. What is the effectiveness of the administrative structure of the MVMW Workshop in Government Science and Technical Colleges in Gombe State?

D. Hypotheses

The following null Hypotheses are stated and tested at a 0.05 level of significance:

1. There is no significant difference between the mean responses of Administrators and Teachers on the extent organizational structure of MVMW Workshop affects skill acquisition among Government Science and Technical Colleges students in Gombe State.
2. There is no significant difference between the mean responses of Administrators and Teachers on the effectiveness of administrative structure of MVMW

Workshop in Government Science and Technical Colleges in Gombe State.

II. MATERIALS AND METHODS

A. Research Design

The study utilized a descriptive survey research design to systematically collect and describe data about the Organization and Administration of Motor Vehicle Mechanics Work Workshop in Science and Technical Colleges. The survey design was employed to compare respondents' opinions, explicitly focusing on administrators and teachers in Gombe State's Technical Colleges. The design was chosen due to its suitability for gathering detailed information for analysis and generalization.

The study was conducted in Gombe State, located in the Northeastern part of Nigeria. The State encompasses 18.768 square kilometers with a population of approximately 2.4 million. It shares borders with Yobe, Borno, Adamawa, Taraba, and Bauchi. The study population comprised 42 administrators (principals, vice principals, senior masters, mistresses, and MVMW Head of Departments) and 21 MVMW teachers, totaling 63 respondents. Whole population sampling was adopted for the study.

B. Research Instruments

The research employed a researcher-developed questionnaire with two sections: Section A captured respondents' data, and Section B delved into various aspects of the MVMW. The questionnaire used a modified Likert scale to rate respondents' opinions. The instrument's validity and reliability were ensured through expert validation, and Cronbach's alpha was used to assess internal consistency, which 0.85 was obtained. Research assistants collected data from Gombe State Government Science and Technical Colleges. The collected data were analyzed using SPSS Version 26, involving descriptive statistics such as mean and standard deviation to address research questions and t-tests for the hypotheses. A mean score of 3.50 was used as a threshold for decision-making, with scores above indicating positive responses and below indicating negative responses. The hypotheses were tested using a significance level of 0.05, where p-values below 0.05 led to rejected null hypotheses. See Table I and Table II for the items of the instruments.

TABLE I. EFFECTIVE ORGANIZATIONAL STRUCTURE OF MOTOR VEHICLE MECHANICS WORK WORKSHOP

No	Items
1	Good workshop organization structure provide means of allocating task to individuals student to perform to achieve MVMW Workshop practical skills acquisition.
2	Systematic organization of human, materials, tools, equipment in MVMW Workshop provides effective students skill acquisition.
3	Organization of instructional materials as indicated in the scheme of work enables students achieve overall objective of the MVMW Workshop practice.
4	Effective workshop organization helps the MVMW Head of Department to mobilize activities that involve human and material resources for the pursuit of students skill acquisition.
5	MVMW teacher uses instructional techniques such as lectures' demonstrations, case studies to inculcate skills.
6	MVMW Instructors ensures the students observe workshop safety rules and regulations during workshop activities, demonstrates how students carry out workshop activities.
7	MVMW workshop Assistant ensures new supplies are ordered on time to prevent stocks becoming exhausted and make raw materials available for students workshop practice.
8	MVMW Workshop store keeper receives and inspects all the incoming materials and reconciles with purchasing order, Store materials in organized manner and easy record retrieval during students practical's.

No	Items
9	MVMW Workshop Attendant opens and closes all the workshop doors and windows on working days, sweep all floors after students class practices.
10	HOD plan and request for the much needed resources and arrange for subsequent plans are place early to facilitate step by step execution of MVMW students practical lessons organizations.
11	Technical College provide appropriate personnel in MVMW workshop avoid inviting road side technicians or ex-students to demonstrate skills or construct project to students.
12	MVMW personnel duty roster should be pasted on board, practical materials be readily available for even distribution of students practical materials.
13	MVMW HOD demonstrates competence for entrepreneurship role plays in organizing workshop activities to expose students skills.
14	Regular workshop activities, demands for instructional materials, textbooks, etc contribute toward organization of practical lesson delivery, for executing MVMW students projects.
15	Good MVMW teachers should assign individual student projects which should be carried out as occupational task toward developing the students skills in an occupation.
16	Standby power options must be constant to permit operation in any electrical operating machine to ensure good practical delivery throughout students practice.
17	Guards and housing must be fixed to cover the dangerous machines and parts to prevent student's injuries.
18	MVMW workshop plans contain workshop facilities, organization, and administration which require successful achievement of objectives.
19	MVMW equipment inventory form must contain in supplies recorded and assigned with a brand and inventory number permanently on it, for students and personnel identification.
10	MVMW workshop provide accident reporting form to contain things like, cause of injury, the type of injury, action taken... to prevent recurrence of student's accidents.
Grand mean	

TABLE II. EFFECT OF THE ADMINISTRATIVE STRUCTURE OF MOTOR VEHICLE MECHANICS WORK WORKSHOP

No	Items
1	MVMW Workshop Administration involves planning activities to fulfill the goal of the organization e.g. knowledge and practical skills
2	Planning MVMW are the activities of HOD which result to a course of action directed toward skill acquisition among students
3	MVMW HODs function is to initiate new procedures for accomplishing the organization goals and objectives in skill acquisition.
4	Arrangement of productive resources, procurement techniques, timetable and decision making, improves MVMW workshop activities, for promotion of students practical skills.
5	A formal presentation of required list of the facilities with costs to the principal for approval and release of funds. Is done by head of department.
6	MVMW HOD delegate responsibility and authority freely, plans ahead to get the duties performed and involve staff in decision making facilitate students skill acquisition.
7	Principal responsible for funds utilization in collaboration with MVMW HOD makes sure workshop properties not fall in the state of disrepair.
8	HOD should finds out the truth of all things, dispel rumors that can mar the progress of the MVMW workshop.
9	Responsibilities sharing among the staff of MVMW improve students training and performance
10	Hierarchy levels of decision making and authority relationships in MVMW Workshop, ensures proper coordination of functions among personnel.
11	Subordinate or individuals interest ensure the smooth running of the MVMW Workshop.
12	Motivating MVMW personnel through the provision of incentive encourages to achieve higher productivity.
13	Head of Departments must be firm but fair in all activities of MVMW Workshop.
14	Achievement of objectives of MVMW Workshop activities partly depends on all achievement sundry.
15	MVMW Head of department must have ability to influence other person's behavior and capacity to structure social interaction systems to the purpose at hand.

No	Items
16	HOD has to make budget, acquire operational materials, organize workshop personnel and students, ensure equipment are in good operating condition, and ensure students safety during practical's
17	MVMW HOD leadership styles, approaches, motivation and communication to subordinates hope to be satisfactorily.
18	MVMW HOD watches the subordinates e.g. Teachers, Attendants, Assistants and student's activities and make sure to deliver as expected.
19	MVMW Teachers always plan and organize activities, make rehearsal before executing lesson.
20	Time table helps to reduce clashes among the workshop personnel as well as guide students to complete assigned projects at appropriate time, adhering strictly to MVMW Workshop program to promotes students learning activities.
Grand mean	

III. RESULTS

A. Research question one

To what extent does the organizational structure of MVMW Workshop affects skill acquisition among Government Science and Technical Colleges students in Gombe State?

TABLE III. MEAN AND STANDARD DEVIATION ON EFFECTIVE ORGANIZATIONAL STRUCTURE OF MOTOR VEHICLE MECHANICS WORK WORKSHOP (N₁= 42, N₂=21)

No	\bar{X}_1	SD ₁	\bar{X}_2	SD ₂	\bar{X}_G	SD	Remark
1	4.29	0.63	3.93	0.80	4.17	0.72	Agreed
2	4.23	0.82	4.09	0.83	4.19	0.82	Agreed
3	4.09	0.79	4.19	0.74	4.13	0.77	Agreed
4	4.11	0.71	4.33	0.65	4.19	0.68	Agreed
5	3.90	0.87	4.14	0.73	3.98	0.80	Agreed
6	4.14	0.72	4.29	0.85	4.19	0.78	Agreed
7	3.76	0.62	4.24	0.70	3.92	0.66	Agreed
8	4.14	0.78	4.10	0.70	4.13	0.74	Agreed
9	4.14	0.72	3.86	1.06	4.05	0.86	Agreed
10	4.19	0.67	3.90	1.09	4.10	0.88	Agreed
11	3.76	0.91	3.67	1.15	3.73	1.03	Agreed
12	4.02	0.84	3.95	0.86	4.00	0.85	Agreed
13	4.11	0.63	4.00	0.89	4.08	0.76	Agreed
14	4.19	0.63	3.76	0.91	4.05	0.81	Agreed
15	4.14	0.72	4.02	0.67	4.11	0.70	Agreed
16	4.14	0.81	4.38	0.67	4.22	0.74	Agreed
17	4.21	0.72	4.14	0.73	4.19	0.72	Agreed
18	4.12	0.63	3.95	0.80	4.06	0.72	Agreed
19	3.95	0.70	3.90	0.10	3.94	0.84	Agreed
10	4.00	0.86	3.76	1.09	3.92	0.97	Agreed
4.08	0.74	4.03	0.80	4.07	0.79		

Source: Researcher (2022)

The results presented in Table III reveal that the respondents agreed with all the items. This means that all the items can improve the organizational structure of Motor Vehicle Mechanics Work Workshop in Government Science and Technical Colleges.

Hypothesis One: There is no significant difference between the mean responses of Administrators and Teachers on the extent to which the organizational structure of the MVMW workshop affects skills acquisition among Government Science and Technical Colleges students in Gombe State.

TABLE IV. T-TEST OF DIFFERENCE BETWEEN ADMINISTRATORS AND TEACHERS ON THE EXTENT THE ORGANIZATIONAL STRUCTURE OF MVMW WORKSHOP AFFECTS SKILLS ACQUISITION

Groups	Mean	Sd	N	T	Sig
Administrators	4.08	0.42	42	0.43	0.50
Teachers	4.03	0.50	21		

Source: Researcher (2022)

Table IV indicates that administrators' responses had a mean score (mean = 4.08, SD = 0.42) compared to that of

teachers with a mean score of $x = 4.03$, $SD = 0.50$ with t -value = 0.43 at 61 degrees of freedom. The hypothesis is accepted because the calculated t -value of 0.43 is statistically more significant than 0.05. This shows administrators and teachers agreed that a good MVMW organizational structure can improve students' skills acquisition in Technical Colleges.

B. Research Question Two

What is the effectiveness of the administrative structure of MVMW Workshop in Government Science and Technical Colleges in Gombe State?

TABLE V. MEAN AND STANDARD DEVIATION ON THE EFFECT OF THE ADMINISTRATIVE STRUCTURE OF MOTOR VEHICLE MECHANICS WORKSHOP ($N_1=42$, $N_2=21$)

No	\bar{X}_1	SD_1	\bar{X}_2	SD_2	X_G	SD	Remark
1	4.26	0.63	4.39	0.72	4.27	0.36	Agreed
2	4.14	0.57	4.10	0.83	4.13	0.42	Agreed
3	4.17	0.62	3.75	0.83	4.03	0.42	Agreed
4	4.17	0.70	3.90	0.94	4.08	0.47	Agreed
5	4.19	0.63	3.71	1.31	4.03	0.65	Agreed
6	4.83	6.23	4.00	1.05	4.56	0.52	Agreed
7	4.09	0.87	3.87	0.93	3.10	0.46	Disagreed
8	3.93	0.81	3.90	0.77	3.92	0.38	Agreed
9	4.17	0.72	4.19	0.61	4.16	0.30	Agreed
10	4.10	0.62	3.81	0.75	3.10	0.37	Agreed
11	3.83	0.10	3.57	1.03	3.75	0.51	Agreed
12	4.07	0.84	3.90	0.83	4.02	0.02	Agreed
13	3.98	0.72	4.19	0.79	4.03	0.40	Agreed
14	3.88	0.80	3.61	0.97	3.79	0.49	Agreed
15	4.07	0.75	3.52	1.33	3.89	0.66	Agreed
16	4.24	0.73	4.9	0.85	4.25	0.42	Agreed
17	3.83	0.66	4.05	0.66	3.90	0.43	Agreed
18	5.21	6.33	4.14	0.57	4.86	0.29	Agreed
19	4.11	0.67	4.29	0.85	4.17	0.42	Agreed
20	4.42	0.70	4.28	0.67	4.41	0.3	Agreed
	4.18	1.24	4.00	0.86	4.02	0.41	Agreed

Source: Researcher (2022)

The results presented in Table V above indicates that the respondents agreed with all the items except item 47, having a grand mean of 3.10. This means that all the items except item 47 can improve the Administrative structure of the Motor Vehicle Mechanics Work Workshop in Government Science and Technical Colleges.

Hypothesis Two: There is no significant difference between the mean responses of Administrators and Teachers on the extent Administrative structure of MVMW workshop Government Science and Technical Colleges in Gombe State.

TABLE VI. T-TEST OF DIFFERENCE BETWEEN ADMINISTRATORS AND TEACHERS ON THE EXTENT OF EFFECTIVE ADMINISTRATIVE STRUCTURE OF MVMW WORKSHOP

GROUPS	Mean	SD	N	T	Sig
Administrators	4.18	0.65	42	1.31	0.50
Teachers	3.79	0.54	21		

Source: Researcher (2022)

The data presented in Table VI summarized the t -test analysis on the differences between responses of administrators, had a mean score x mean = 4.18, $SD = 0.65$ compared to that of teachers, had a mean score of (= 3.79, $SD = 0.54$) with t -value = 1.31 at 61 degrees of freedom. The hypothesis is accepted because the calculated t -value of 1.31 is statistically more significant than 0.05. This shows administrators and teachers agreed that a good MVMW administrative structure can improve effectiveness in Technical Colleges.

IV. DISCUSSION

The finding revealed that the Motor Vehicle Mechanics Work Workshop in Government Science and Technical Colleges's organizational structure has a high mean. This shows that MVMW's organizational structure will improve skill acquisition. The finding reflects that of Ref. [14], who asserted that planning, organizing, coordinating, and evaluating are techniques required by metalwork teachers to improve their performance in managing the technical schools' metal workshops. The planning technique includes designing the program, scheduling the duration of workshop lessons, setting standards for metalwork activities, and developing work objectives in measurable terms. The organizing technique includes arranging tools, inspecting, identifying worn out, broken, and missing tools, delegating functions to ideal personnel in the workshop, etc. This finding is similar to that of Ref. [5]. Research findings reveal effective management conducts such as planning, organizing, acting, coordinating and controlling, creative work, and separating theoretical and practical curricula. Ref. [6] pointed out that effective workshop organization is the Head of the Department's ability to mobilize activities involving human or material resources for efficient workshop organization to pursue specific goals.

The finding revealed that the administrative structure of the Motor Vehicle Mechanics Work Workshop in Government Science and Technical Colleges ascertains a high mean. This study concurs with Ref. [15], who discovered in his study that the workshop administration management application is valid and can be used in the learning process. Using Workshop management (ICT) application provides faster activities in the workshop, orderliness, security, and seamless. The finding is also similar to Ref. [5] which revealed that effective management conduct is as paramount as planning, organizing, acting, coordinating and controlling, creative work done, and separating theoretical and practical curriculum. The finding aligns with Ref. [16] that the Achievement of Objectives of Motor Vehicle Mechanics Work workshop activities partly depends on achieving administrative tasks.

The study's finding for hypothesis 1 revealed no significant difference between the mean responses of Administrators and Teachers on the extent to which the organizational structure of the Motor Vehicle Mechanics Work workshop improves skills acquisition among Government Science and Technical Colleges students in Gombe. The finding concurs with Ref. [17], who stated that organizing the workshop properly will engender effective utilization of workshop skill acquisition. In line with the finding, Ref. [18], [19] assessed that introductory teachers need the knowledge of workshop management in organizing practical workshops.

Study hypothesis 2 revealed no significant difference between the mean responses of Administrators and Teachers on the extent to which Administrative structure is needed to improve Motor Vehicle Mechanic's Work workshops in Government Science and Technical Colleges in Gombe State. The finding agrees with Ref. [20], [21] who reported that technical college administration requires skilled personnel to coordinate the workshop activities. Ref. [20] maintained that workshop personnel cannot differentiate between various administrative skills. To further support the finding, ref. [21], who assessed the effective administration of technical/vocational education workshops, reported that there was no significant difference between opinions of teachers and

workshop instructors on the administrative skills required by workshop instructors for effective utilization of the workshop.

V. CONCLUSION

In conclusion, this study emphasizes the pivotal role of organizational and administrative structures in the Motor Vehicle Mechanics Work (MVMW) Workshop within Government Science and Technical Colleges in Gombe State. The findings demonstrate that an optimized organizational structure significantly enhances skill acquisition among students, creating an environment conducive to effective learning. Simultaneously, a well-designed administrative structure improves the workshop's functionality, ensuring its smooth operation. Moreover, the alignment of viewpoints between Administrators and Teachers highlights their shared recognition of the positive impact of these structures on skills acquisition. These results underscore the need for collaborative efforts in designing and maintaining workshop environments that empower students' practical skill development, thereby producing competent professionals capable of meeting the challenges of the automotive industry and technical education landscape.

VI. RECOMMENDATION

Technical Colleges should invest in designing and implementing an organizational structure for their Motor Vehicle Mechanics Work (MVMW) Workshop that enhances students' practical skill development. This involves thoughtful workstations, tools, equipment, and personnel arrangement within the workshop space. The layout should promote efficient workflows, easy access to resources, and a conducive learning environment.

Technical Colleges should focus on establishing administrative systems that support the effective management and operation of the workshop. Administrative personnel should be well-trained and equipped to handle logistical aspects such as maintenance scheduling, resource allocation, and student engagement.

Administrators and teachers should work together to analyze the current organizational structure of the MVMW Workshop and identify areas for improvement. They can develop an organizational framework that optimally supports skill acquisition by leveraging their collective expertise. Regular communication, workshops, and feedback sessions can facilitate this collaborative approach.

Administrators and teachers collaboratively address administrative challenges within the MVMW Workshop. Jointly developing administrative guidelines, protocols, and workflows can lead to smoother operations and improved workshop functionality.

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