

THE IMPACT OF STUDENT INDUSTRIAL WORK EXPERIENCE SCHEME ON THE PERFORMANCE OF MOTOR VEHICLE MECHANICS' WORK GRADUATING STUDENTS OF TECHNICAL COLLEGES IN NORTH CENTRAL NIGERIA

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ABSTRACT

The training of today's motor vehicle mechanics is not only expertise demanding, but also requires a lot of facilities which has to be effectively utilized for the impartation of the relevant skills and knowledge required by trainees for effective maintenance of modern automobiles. The main purpose of this study was to determine the impact of the Students Industrial Work Experience Scheme (SIWES) on the performance of Motor Vehicle Mechanics' Work(MVMW)(NTC III) graduating students of technical colleges in North Central Nigeria. The study answered one research question and tested one null hypothesis in line with the purpose of the study. The population for the study was 465; consisting of 418 male and 38 female MVMW National Technical Certificate(NTC) III graduating students for the 2017/2018 session, in the 22 accredited technical colleges in North-Central States of Nigeria, and 9 MVMW graduates of technical colleges in the area of study who were operating functional workshops. The study adopted Multi-stage Sampling Technique to select a sample size of 189 which comprised of 165 male and 15 female MVMW NTC III graduating students and 9 MVMW graduates of technical colleges from the area of the study. The study utilized both quantitative and qualitative techniques. A questionnaire and Focus Group Discussion (FGD) were used as the instruments for data collection. The reliability coefficient of the instrument yielded 0.82. The research question was answered using mean and standard deviation; while the null hypothesis was tested using t-test at 0.05 level of significance. The finding of the study revealed that SIWES enhances the industrial skill acquisition and work experience of students, thus augmenting their theoretical knowledge and making them more efficient at solving the practical problems of the work environment.

Keywords: *Students Industrial Work Experience Scheme (SIWES), Performance of MVMW Graduating Students*

INTRODUCTION

Automobiles have become the most important form of transportation across the world today. As prime movers of people and goods, they contribute daily to economic and social systems. The automobile, commonly known as motor vehicle or car, is a composite of many complex systems with sophisticated group of technologies assembled together. Malone (2006) stated that, today's cars are factory equipped with computer systems that have more intelligence than the United States' National Aeronautic and Space Administration (NASA) spacecraft sent to the moon. Automobiles now use sophisticated computer technology, advanced wiring, intricate circuitry and complex engineering (New York State Automobile Dealers Association, NYSADA, 2006). The automobile today is controlled by various electronic sensors, actuators, circuits and computers (Schwaller, 1993). Certified Master Tech. (2009) stated that, electronics control approximately 75 percent of modern automobile's operation. According to calpoly.edu/fowen/AutoMech (2012), today's car is a rolling computer; as there are 30-100 microprocessors in a car controlling various systems. These systems require routine diagnosis, maintenance and service. The maintenance of the numerous subsystems of modern automobiles has become highly challenging and expertise demanding.

Automobile maintenance personnel, commonly known as motor vehicle mechanics, must therefore be equipped with the relevant knowledge, skills and the right attitude for effective maintenance of modern automobiles, owing to the influx of automobiles into Nigeria and the challenges of maintaining them. According to Schwaller (1993), one of the most important careers in the automobile industry is that of the motor vehicle mechanic. Today's motor vehicle mechanic is expected to diagnose, service and completely repair any problem in the automobile. He/she must be specially trained and equipped for on-board diagnostic (OBD-2) technology to avoid potential errors in diagnosing car trouble codes and making appropriate repairs (Malone, 2006). The motor vehicle mechanic faces the challenges of understanding each of the systems found in the automobile and the interrelationship of these systems, as well as, the need to stay current with changes as new models appear every year (Schwaller, 1993). They must understand not only the parts, nomenclature and operation, but also understand the diagnosis and service procedure for each system in the vehicle. United States Bureau of Labor Statistics (USBLS) (2012) stated that, motor vehicle mechanics

must have an increasingly broad knowledge of how vehicles' complex components work and interact. They also must be able to work with electronic diagnostic equipment and digital manuals and reference materials. According to Manitoba Advance Education and Training, cited in Audu, Musta'amal, Musta'amal & Inti (2014), motor vehicle mechanics also need to have: an interest in mechanical/electronic systems in motor vehicle, good problem solving ability, good vision, hearing and sense of smell, manual dexterity and mechanical aptitude, ability to communicate well in English, physical fitness and strength, ability to drive a range of vehicles, ability to read technical diagrams and illustration, have concern for safety and responsible work attitude; and in keeping up to date with technology. The above requirements, therefore, not only make the training of motor vehicle mechanics highly tasking and expertise demanding, but also require a very rich curriculum with a lot of facilities for effective and efficient implementation.

The components of the Motor Vehicle Mechanics Work Curriculum (MVMWC) include: aim, objectives, contents, teaching strategies, instructional facilities, and method of evaluation. The aim of the curriculum is to give insight and equip senior secondary school leavers with knowledge, attitude and skill in automobile work that can enable them be gainfully employed (Nigerian Educational Research and Development Council, NERDC, 2009). Aruku (2007) and Audu, Musta'amal, Musta'amal & Inti (2014) paraphrased this to mean that, the programme in Nigeria technical colleges is designed to produce competent motor vehicle craftsmen for Nigeria's technological and industrial development. The general objectives of the course are for the learner to: develop familiarity with the automobile; develop proper attitude towards its use; appreciate the various changes in technologies that are applicable to the automobile; and perform simple fault diagnosis and to effect simple routine automobile maintenance, major and minor repairs (NERDC, 2009). The contents of the MVMWC which are designed and organised in modules for training of motor vehicle mechanics are: safety and maintenance, engine system, fuel system, cooling system, transmission and braking system, electrical systems (lighting system, ignition system), charging system, exhaust system, heating and ventilation system, steering and suspension system, lubrication system, and auto-air conditioning system (NERDC, 2009). The MVMWC is therefore required to impart to motor vehicle mechanics' trainees, all the skills, knowledge and attitude needed that will enable them to be

gainfully employed and also thrive in the profession upon their graduation.

In order to expose trainees to real life work experience in the auto industry before the completion of their course, the Student Industrial Work Experience Scheme (SIWES) has been integrated into the contents of MVMWC. Supervised Industrial Training/Work Experience accounts for 5% of the total hours required for the programme in the MVMWC. SIWES is a laudable skill acquisition programme designed to complement the school workshop/classroom activities, and to aid and facilitate the realisation of the objectives of the MVMWC; hence, the quality and extent of the SIWES programme implementation has direct bearing on both students' performance and achievement upon graduation. Unfortunately, several studies (Puyate, 2008; Fadairo, 2009; Odigiri & Ede, 2010; Idris, 2012; Adekunle, 2013; Inti, Latib & Rufai, 2014; Audu, Musta'amal, Musta 'amal and Inti, 2014; Udogu, 2015) conducted however revealed that the products of the MVMW programme lacked the basic skills needed for gainful employment in today's automobile industry. Even though the MVMW programme is inherently workshop based, and calls for an adequately equipped automobile workshop in each school that offers the course, studies revealed that schools lack basic instructional facilities necessary for effective curriculum implementation; and instructions remains devoid of practical skills as practical activities are highly insufficient for meaningful skills impartation/acquisition.

Again, the SIWES programme integrated to aid, complement and facilitate the training of motor vehicle mechanics before graduation is also bedeviled with numerous challenges as well. Oyenyi (2012), supported this assertion when he posited that, the scheme cannot be said to be achieving the desired objectives due to many factors ranging from: the structural causes of performance problems that have plagued the system; increasing number of students and institutions which place undue pressure on the few surviving industrial organisations; and most students going on attachment in places of convenience without giving considerations to the relevance of the workplace to their course of studies. Hence students benefit less from it. The quality of any (educational) programme implementation of any society is the bedrock of its political, economic, scientific and technological well being. That is why

it is always said that no society can rise above the standard of its education system.

The education system in northern Nigeria is facing a lot of challenges. It has been lagging behind the South prior to Nigeria's amalgamation (Lalo, 2016). While Islamic education was introduced and entrenched much earlier in the north with great influence; Christianity, which was the herald of western formal education had its node of diffusion and influence in the southern part of the country. Since western education in principle and practice was based initially on Christianity and the Bible, just as the Islamic education was based on Islam and the Qur'an; the Moslems which dominated the northern part of the country repelled the content and process of western education until it was too late (Okobiah, 2002). Thus, before the political and administrative advantages of western education became very attractive and worthy of pursuit by the Moslems, the southern Christians had laid durable and self-propelling foundations and achieved considerable progress far ahead of their northern counterparts, Okobiah stated. This rather unfortunate situation has led to the uneven spread of western educational attainment between the northern and southern Nigeria with all the attendant socio-political consequences of our time, Okobiah remarked. The implementation of the SIWES programme of technical colleges in the North Central States of Nigeria is also factored in the situation, as graduates of technical colleges in Plateau State, a case study carried out by Nyapson (2015), have irrelevant and inadequate skills in motor vehicle mechanic, which has rendered most of them jobless in the society. Nyapson stated that they neither set up their own workshops nor are they being employed by automobile industries in the state. Jika (2010) posited that, such half-baked auto craftsmen in the society often cause more damages on vehicles than repairs, when contracted to work on them; and many serviced/repaired vehicles by these craftsmen, according to Jika, have sent many people to their early deaths due to inaccurate or faulty work they've performed on them. Regrettably, lack of instructional facilities, coupled with the ineffective utilization of the few available, in the implementation of the SIWES programme of technical colleges in North Central states of Nigeria has been a part of the bane of the MVMWC implementation; as graduates of the motor vehicle mechanics' work programme lacked the basic skills and the right attitude needed for gainful employment in today's automobile industry. Therefore, the problem of this study was to determine the

impact of the SIWES on the performance of motorvehicle mechanics' work graduating students of technical colleges in North Central Nigeria.

STATEMENT OF THE PROBLEM

Today's motor vehicle mechanic is expected to diagnose, service and completely repair any problem on the automobile. Furthermore, the mechanic must possess: good problem solving ability, manual dexterity and mechanical aptitude, responsible work attitude. He/she must have an increasingly broad knowledge of how vehicles' complex components work and interact. They must be able to work with electronic diagnostic equipment and digital manuals and reference materials. They also need to have good problem solving ability, good vision, hearing and sense of smell, manual dexterity and mechanical aptitude, ability to communicate well in English, physical fitness and strength, ability to drive a range of vehicles, ability to read technical diagrams and illustration, have concern for safety and responsible work attitude; and in keeping up to date with technology. The above requirements can only be achieved via a rich curriculum with a lot of facilities via effective curriculum implementation. The training of today's motor vehicle mechanics therefore is not only highly tasking and expertise demanding, but also requires a very rich curriculum with a lot of facilities for effective and efficient implementation.

Unfortunately, several studies (Odigiri & Ede, 2010; Idris, 2012; Adekunle, 2013; Inti, Latib & Rufai, 2014; Audu, Musta'amal, Yusri, Mohammed and Inti, 2014; Udogu, 2015) have revealed that technical colleges products of the MVMW programme lacked the basic skills and the right attitude needed for gainful employment in today's automobile industry. Regrettably, the SIWES programme integrated to aid, complement and facilitate the training of motor vehicle mechanics before graduation is also bedeviled with numerous challenges as well; thereby constituting part of the bane of the MVMW programme. Therefore, the problem of this study was to determine the impact of the SIWES on the performance of motor vehicle mechanics' work graduating students of technical colleges in North Central Nigeria.

Purpose of the Study

The purpose of the study was to determine the impact of the Students Industrial Work Experience Scheme (SIWES) on the performance of

MVMW (NTC III) graduating students of technical colleges in North Central Nigeria.

Research Question

1. What are the impacts of the Students Industrial Work Experience Scheme (SIWES) on the performance of MVMW (NTC III) graduating students of technical colleges in North Central Nigeria?

Hypothesis

The null hypothesis that guided the study was tested at 0.05 level of significance:

1. Significant difference does not exist in the mean ratings of male and female MVMW (NTC III) graduating students on the impacts of Students Industrial Work Experience Scheme (SIWES) on MVMW (NTC III) their performance.

METHODOLOGY

The study adopted the descriptive survey research design. The study was carried out in North-Central Nigeria; comprising of: Kogi, Niger, Benue, Kwara, Plateau, Nassarawa and the Federal Capital Territory. The population for this study was 465; consisting of 418 male and 38 female MVMW NTC III graduating students for the 2017/2018 session in the 22 accredited technical colleges in North-Central Zone of Nigeria, and 9 MVMW graduates who were operating functional workshops. The study adopted Multi-stage Sampling Technique. The subjects for the study comprised two sample groups – graduating students and graduates of MVMW. A sample size of 189 was used for the study, comprising of 165 male and 15 female MVMW NTC III graduating students, and 9 MVMW graduates who were operating functional workshops. In stage one, a purposive sampling technique was adopted to select (based on school type) two Federal Science and Technical Colleges and six State owned Technical Colleges. In stage two, a proportionate stratified random sampling technique was adopted to sample the 165 male and 15 female MVMW NTC III graduating students from the selected schools representing ratio 11:1 based on the proportion of the population of male and female. Some 9 other MVMW graduates who were operating functional workshops in the area of the study were also selected and used for Focus Group Discussion (FGD).

The Focus Group Discussion (FGD) was conducted with the nine graduates of technical colleges in the area of the study who were operating functional workshops. This was with a view to find out from them, based on their experience on the job after school and the knowledge acquired on the job the impact of the Students Industrial Work Experience Scheme (SIWES) on their performance.

The study utilized both quantitative and qualitative techniques for the purpose of enriching the findings. A structured Questionnaire was used for data collection. The questionnaire answered the Research Question (RQ) of the study. The questionnaire was divided into two sections (A & B). Section A solicited information on personal data of the respondents. Section B determined the impact of Students Industrial Work Experience Scheme (SIWES) on respondents' performance. Respondents were required to express their opinions on the degree of agreement or disagreement to the 15 items provided using the response categories of (SA – Strongly Agree, A – Agree, U – Undecided, D – Disagree, and SD – Strongly Disagree, rated 5, 4, 3, 2, and 1 respectively. The reliability coefficient of the instrument yielded 0.82.

Method of Data Collection

Copies of the questionnaire were administered to the respondents by the researcher through personal contact and with the help of MVMW teachers from each of the sampled schools, who served as research assistants. A total number of 180 copies of the instrument were administered accordingly and retrieved from the respondents for analysis. Thereafter, the nine graduates selected in the area of the study who were operating functional workshops were assembled in a designated location, and the focus group discussion conducted.

Method of Data Analysis

Data collected were subjected to appropriate quantitative and qualitative analyses using descriptive statistics. The research question was answered using mean and standard deviation; while the null hypothesis was tested using t-test at 0.05 level of significance. Decision for the research questions were based on real limit of numbers; while decision on the hypothesis was based on comparing the significant value with 0.05 level of significance. Where the significant value is less than 0.05, it was considered that, there is a significant difference, otherwise, is taken to be not significant.

RESULT

Research Question 1

What are the impacts of Students Industrial Work Experience Scheme (SIWES) on MVMW (NTC III) graduating students' performance?

Table 1: Mean and Standard Deviation (SD) of Respondents on the Impact of Students Industrial Work Experience Scheme (SIWES) on MVMW (NTC III) graduating students' Performance

SN	Impacts of Students Industrial Work Experience Scheme (SIWES)	Mean	SD	Remarks
1	Is a means of bridging the gap between career expectations developed in the classroom and the reality of employment in the real world.	4.42	0.86	Agree
2	Enhanced academic performance in school.	3.79	0.87	Agree
3	Equipped respondents with more practical skills for the vocation	3.75	0.72	Agree
4	Gave respondents more confidence in the MVMW vocation	3.72	0.88	Agree
5	Gave respondents real knowledge of the workplace	3.63	0.83	Agree
6	Equipped respondents with the right attitude needed for the MVMW	3.52	0.92	Agree
7	Helped respondents develop some of the basic work habits required for successful career the job	3.60	1.11	Agree
8	Prepared respondents the more for the MVMW	3.62	0.87	Agree
9	Bridged the gap for respondents between most of the theoretical concepts taught in the class and practical experience on the job.	3.62	0.79	Agree
10	Taught respondents some things that were never taught in the classroom or in the school workshop	4.27	1.00	Agree
11	Provided respondents access to some of the teaching/learning materials absent in the school	3.59	0.98	Agree
12	Provided respondents more explanations by experts on the job than my teachers.	3.75	1.02	Agree
13	Provided respondents more demonstrations by experts on the job than my teachers.	4.23	1.00	Agree
14	Respondents discovered some discrepancies in some areas between some of the things they were taught in school and what they found out during their SIWES	2.39	0.67	Disagree
15	Exposed respondents to the practical demand and expectation of their career than the school.	3.61	1.06	Agree
	Grand/Overall	3.72	0.90	Agree

The data presented in Table 1 above revealed that the respondents agreed that all the items in the table impacted on their performance with mean ranging from 3.52 to 4.42; with the exception of only 1 (item 14) that was disagreed upon with a mean 2.39. The grand/overall mean was 3.34. This shows that respondents agreed that the Industrial Work Experience

Scheme (SIWES) impacted on their performance. FGD also corroborated the impacts of Students Industrial Work Experience Scheme (SIWES) on their performance.

Hypothesis

t-test was used in testing the null hypothesis for the study. The analysis was done using Statistical Package for Social Sciences (SPSS). The result is hereby presented in Table 2.

Hypothesis 1

Significant difference does not exist between the mean ratings of male and female MVMW (NTC III) graduating students on the impacts of Students Industrial Work Experience Scheme (SIWES) on MVMW (NTC III) graduating students' performance.

Table 2: T-test Analysis of the Mean Responses of Male and Female MVMW (NTC III) Graduating Students on the Impacts of Students Industrial Work Experience Scheme (SIWES) on MVMW (NTC III) Graduating Students' Performance.

SN	Items	Male Graduating Students		Female Graduating Students		t-cal	Sig.	Remarks
		N=165		N= 15				
		X ₁	SD ₁	X ₂	SD ₂			
1	Is a means of bridging the gap between career expectations developed in the classroom and the reality of employment in the real world.	4.41	0.71	4.45	0.69	-.164	.870	NS
2	Enhanced academic performance in school.	3.76	0.69	3.89	0.33	-.548	.247	NS
3	Equipped respondents with more practical skills for the vocation	3.74	0.53	3.78	0.44	-.189	.645	NS
4	Give respondents more confidence in the MVMW vocation	3.71	0.58	3.78	0.43	-.318	.463	NS
5	Given respondents real knowledge of the workplace	3.60	0.73	3.78	0.44	-.719	.162	NS
6	Equipped respondents with the right attitude needed for the MVMW	3.53	0.72	3.43	0.71	.390	.901	NS
7	Helped respondents develop some of the basic work habits required for successful career the job	3.58	0.76	3.78	0.44	-.767	.126	NS
8	Prepared respondents the more for the MVMW	3.61	0.81	3.67	0.50	-.210	.419	NS

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9	Bridged the gap for respondents between most of the theoretical concepts taught in the class and practical experience on the job.	3.60	0.72	3.78	0.44	-.732	.143	NS
10	Taught respondents some things that were never taught in the classroom or in the school workshop	4.26	0.79	4.29	0.81	-.723	.525	NS
11	Provided respondents access to some of the teaching/learning materials absent in the school	3.60	0.58	3.56	0.53	-.221	.781	NS
12	Provided respondents more/better explanations by experts on the job than my teachers.	3.74	0.53	3.78	0.44	-.189	.645	NS
13	Provided respondents more/better demonstrations by experts on the job than my teachers.	4.23	0.64	4.22	0.67	.869	.556	NS
14	Respondents discovered some discrepancies in some areas between some of the things they were taught in school and what they found out during their SIWES	2.46	1.05	2.10	1.32	-1.23	.280	NS
15	Exposed respondents to the practical demand and expectation of their career than the school.	3.60	0.66	3.67	0.50	-.296	.395	NS
	Grand /Overalls	3.70	0.65	3.73	0.58	-.434	.337	NS

Key: X_1 = Mean of male graduating students, X_2 = Mean of female graduating students; SD_1 = Standard Deviation of male graduating students, SD_2 = Standard Deviation of female graduating students; Degree of freedom (df) = 178; Sig= significance level (2 tailed); t t-cal= calculated values of t-test SPSS; S= significant; NS= NotSignificant

Table 2above presents the t-test analysis of the mean responses of male and female MVMW (NTC III) graduating students on the impacts of Students Industrial Work Experience Scheme (SIWES) on MVMW (NTC III) graduating students' performance. The data revealed that all the items in the table have their significant value ranged from .126 to .901, which are all greater than 0.05. Therefore, the null hypothesis of no significant difference between the mean response of male and female MVMW (NTC III) graduating students on the impacts of Students Industrial Work Experience Scheme (SIWES) on MVMW (NTC III) graduating students' performance for all the 15 items is accepted.

DISCUSSION OF THE FINDINGS

The data presented in Table 1 provided answers to the research question; which is on the impacts of Students Industrial Work Experience Scheme (SIWES) on MVMW (NTC III) graduating students' performance. Finding revealed that respondents agreed with all the listed impacts of SIWES on their performance. They as well disagreed to having discrepancies in some areas between some of things they were taught in school and what they found out during their SIWES. FGD as well corroborated that SIWES impacted on their performance. This implies that SIWES: is enhancing the industrial skill acquisition and work experience of students, thus augmenting their theoretical knowledge to make them efficient at solving the practical problems of the work environment; exposing students to different categories and classes of people to improve their people skills, interactional abilities and team spirit and enhance their abilities to build positive working relationships with a wide range of individuals and organizations; affording students the additional opportunity of learning how to write field reports; contributing to the quality and size of the nation's manpower, technological development and overall skill levels; are being realized notwithstanding the challenges posited by Oyeniyi (2012) to bedeviling it.

Implications of the Findings

The implication of the findings of the study buttress the need for SIWES, not only to be sustained and supported, but be encouraged in technical colleges in the North Central States of Nigeria.

RECOMMENDATION

Based on the findings of the study, it was recommended that SIWES should be sustained and supported in all the technical colleges in the North Central States of Nigeria.

CONCLUSION

Based on the findings of this study, it was concluded that, all hands must be on deck by all MVMWC implementation stakeholders to ensure that SIWES is not only sustained, but also supported in all the technical colleges in the North Central States of Nigeria.

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