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MECHANICAL TECHNOLOGY EDUCATION AND ITS INFLUENCE ON HUMAN CAPITAL GROWTH IN RIVERS STATE, NIGERIA

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DOI:https://doi.org/10.5281/zenodo.15389106

Abstract: Mechanical technology education as a branch of Technical and Vocational Education and Training (TVET) is geared towards equipping youths for work. It is a suitable methods of curbing the socio-economic challenges currently faced by the nation with respect to dwindling revenue, social unrest and increase in unemployment rate. The study examined the impact of mechanical technology education on manpower development in Rivers State. Descriptive survey research design was used for the study. The sample of 20 industries was drawn from 70 manufacturing companies in Rivers State, using purposive sampling technique. While a total number of 78, 337 workers were sampled in all the 20 selected industries for the study. A self-developed checklist titled "Mechanical Technology Education Manpower Development Checklist (MTEMDC)" with a cronbach-alpha reliability coefficient of 0.78 was used for data gathering. Descriptive statistic of percentages as well as inferential statistics of Pearson product moment correlation was used for the data analysis. The findings revealed a very low percentage of mechanical technology education graduates employed by the industries in Rivers State, and significant contribution of Mechanical Technology education to manpower development in Rivers. It is therefore concluded among others that both State and the nation's universities, polytechnics, and colleges should be up and doing in exposing the Mechanical Technology students and or trainees to new ideas and technologies so as to be relevant in the world of work and integrate more quickly into the global economy, as businesses restructure their supply chain and operations to gain from regional comparative advantages.

Keywords: Mechanical Technology Education, Economic Growth, sx bManpower Development, Unemployment rate.

INTRODUCTION

In recent times, human capital development has
been the focus of concern towards the industrialization of a nation. This is a fact that the growth of a special capital stock of a nation depends to a considerable level on human capital development. Without adequate

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investment in developing the human capital which is the process of increasing knowledge, skills and the capacities of people in the country, the possibility of the growth of that nation might be minimal. Mechanical technology as a branch of TVET has a significant role to play in the transfer of technical knowledge and skills needed for work for Nigerian youth and Africa at large. This work is a review of such subject matter as a tool for national development. Manpower development has to do with organized learning activities arranged in a well-organized setting for the purpose of improving performance and or personal growth so as to improve the job, the individual, and the organization. This includes the broader range of activities to develop personnel inside of the organizations including for example, areas of training and development, career development, and organization development. Human resource development (HRD) in totality is a dynamic, ongoing, continuing, empowering process. The individual human being's growth is multidimensional, influencing the cognitive, affective, physical and spiritual facets of the human person. These definitions recognize the strengths and limitations of people as well as their potentials. The goal of HRD is to improve the performance of the organizations by maximizing the efficiency and performance of the people. It develops employees' knowledge and skills, actions and standards, motivation, incentives, attitudes and work environment.

Mechanical Technology education is a special education, which is intended to provide the skills and the manpower for industry and other engineering services required for providing services. That is why the programme includes general studies, practical training for the development of skills required by the chosen occupation and related theory (Olaitan, 1996). There is no doubt that Mechanical Technology education as a tier of TVET plays a significant role in the socio-economic growth and development of a country.

Enebe (2000) highlights the significant roles which TVET can play in curbing unemployment and in providing the needed skilled labour for industrialization. According to Enebe (2000), "technical education stresses the engineering aspect of vocational education such as electrical/electronics, mechanical and automobile works". Thus, both vocational education and technical education aim at developing, among others, useful skills for productive purposes. The world has become aware in recent times of the magnitude of the changes resulting from advances in and the intensive application of technology. Science and technological knowledge have become so important that today; they have replaced capital as society's most important resources. The efficiency of the system of TVE of a nation is a major factor that determines its economic well-being, its standard of living, its potential growth and security.

Mechanical Technology Education for Job Creation

Basically, technical education options offered in the Nigerian education system are auto mechanics/automobile technology, building technology, drafting technology/technical Drawing, electrical/electronic technology, industrial craft, metal work technology, plastics and plastic recycling technology and wood technology. Mechanical technology is an integration of automobile and metal work technology. It can be said therefore that Mechanical Technology can be divided into two broad groups of areas generally referred to as metal production and the automobile system options; each of these options are made up of several occupations that requires specialized training. In metalwork technology for instance, we have occupations like foundry or metal casting, sheet metal work, welding and fabrications, machining and steel structural works to mention a few. In the automobile options, we have panel beating and car chassis designers, motor engine block designers and production, auto-electricians and auto air conditioning works (Elom, Naatom and Ben-Kporo , 2019).

Usoro, Mathew, and Udofia (2009) opined that there are job opportunities in the auto- mechanic work such as engine cleaning, lubricating auto systems, mechanical repair job, engine tune-up, brake system service and repair, front end service job, auto electricity job, auto air conditioning job, auto body repair, auto shop management,

service station management, spray painting, auto interior upholstery, chassis repair job, vulcanization, radiator repair job, crankshaft cutting, mechanic driver, engine building/service, wheel alignment and tyre balancing, auto instructing job and just recently there is the new use of On-Board Diagnosing machine which is a special field in auto work where the machine attached to the faulty car via a port diagnoses the car's fault and for identifying of the car's fault alone before repair are paid for that job alone.

This helps the owner of the car to be more specific in describing the fault to a repair without just guessing what could have been the problem. This field is gender accommodating as many female job seekers can get trained in this field and becomes self-reliant and in fact employers of labour. The metal work technology provides such jobs as machining career, welder fitting job, welding analysis, welding technician, metallurgist ,welding shop management, foundry work, welding fabrication jobs such as metal door, window and protector construction, and welding instructor. In summation therefore, about thirty-one (31) job opportunities exist in the field of mechanical technology education. The multiplier effect of this field of study/training in job creation is also very important. It is common knowledge that on the average, it requires more than two to run a medium scale workshop. Mechanical technology education is therefore a critical field of study that has the potential to create employment opportunities for millions of the teeming unemployed African youth and Nigerian youth in particular.

Mechanical Technology Education Delivery challenges in Nigeria

According to Etuk and Asukwo (2015), the challenges facing the professionalism of the teaching profession include the practice of training would-be teachers by mushroom/satellite campuses; introduction of part-time programme to the would-be teachers, recruitment of uncertified and unqualified teachers to teach in the schools among others. Most TVET departments in our higher institutions do not have well equipped laboratories, workshops and usable infrastructures. Where these exist, they are grossly inadequate, obsolete and in a dilapidated state. Indication shows that only 40% of tertiary institutions in Nigeria have laboratories or workshop spaces for TVET programmes, the remaining 60% of other institutions do not have laboratories or workshop spaces and this affects the low quality of technology programmes in higher institutions (Dokubo, 2013). There is also the issue lack or inadequate professionals in curriculum design of Mechanical Technology education in Nigeria to capture and reflect key components of TVET as conventionally practiced globally. Shortage of qualified staff is a major challenge faced by institutions running Mechanical Technology education in Nigeria. Most of the Institutions suffered lack of enough training personnel and in some cases these institutions resort to using unqualified persons'. Mechanical Technology education is such a capital intensive field of training, lathe machines and production simulation machines are very expensive to procure. Some of these production machines are custom built on special order. Milling machines, shaping machines, power hacksaw, heavy duty welding machine, live demonstration engines, dead engines, complete car body, arc welding machines, oxy-acetylene welding equipments, spot welding machine all are very capital intensive. So funding can really be a critical challenge to the running of such a course that has sufficient opportunities to alleviate or even eradicate unemployment from Nigeria and Africa at large. According to Umunadi (2010), United Nation Educational , Scientific and Cultural Organization (UNESCO) stipulates that at least 26% of the national budget must be committed to education , the Nigeria Budget for the education sector for year 2019 is far lower than this, which is pegged at 7.05% of the total budget. Another challenge is lack of availability of Information and Communication technology (ICT), availability of e-library, wifi and internet availability. Technology is dynamic on a daily basis as such trainee / students' must be currently globally compliant with international best acceptable practice. Another issue of concern is the collaboration of these institutions running mechanical technology with the private sectors into commercial production, there seems to be a static knowledge delivery gap at the public tertiary institution offering

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mechanical technology education while the private sector is advancing in Research and Design thereby being dynamic in product design while the public schools remain static , it therefore necessary for there to be public private partnership (PPP) to bridge the gap that may exist through internships , excursions and knowledge sharing to sustain some extend of balance .

Statement of the Problem

Mechanical technology education as a critical field of study that has the potential to create employment opportunities for millions of the teeming unemployed African youth, Nigerian youth, and Rivers youth in particular. This seem not to be achieved and appear to be made difficult by several constraints which include inadequate professionals in curriculum design of mechanical technology education in Nigeria, shortage of staff in institution running mechanical technology education, lack of well-equipped laboratories, lack of usable infrastructure in the workshop, lack of information and communication technology (ICT) such as E-libry, wifi , and internet these and more seems to have prompted high unemployment rate in Rivers state. The identified issues have formed the need to conduct a study on the Impact of Mechanical Technology on Manpower Development in Rivers state. **Purpose of the Study**

The purpose of the study is to investigate the impact of mechanical technology education on manpower development in Rivers State. **Research Question**

1. What is the numerical strength of the mechanical technology education graduates employed by the industries in Rivers State?
2. What is the percentage of the mechanical technology education graduates employed by the industries in Rivers State?
3. Is there any significant impact of mechanical technology education to manpower development in Rivers State?

Research Methodology

The study employed descriptive survey design. The area of was Rivers State. The population of the study comprised 78, 337 workers in 20 selected industries out of the 70 manufacturing companies in Rivers State according to https://www.dnb.com/business-directory/companyinformation.manufacturing.ng.rivers.html . A purposive sample procedure was adopted. The purposive selection involved the major cities with higher number of workers for easy assessment.

A self-developed checklist titled “Mechanical Technology Education Manpower Development Checklist (MTEMDC)” with a cronbach-alpha reliability coefficient of 0.78 was used for data gathering. Descriptive statistics of percentages as well as inferential statistics of Pearson product moment correlation was used for the data analysis.

Results and Discussion

Q 1: What is the numerical strength of the mechanical technology education graduates employed by the industries in Rivers State?

Q 2: What is the percentage of the mechanical technology education graduates employed by the industries in Rivers State?

Table 1: Total Number of mechanical technology education graduates employed by the industries in Rivers State.

S/N	Organization / Establishment	Total No. of Staff	Total No. of MTE Graduates Among	% Of MTE Graduates Among Staff

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			Staff	
1	Nigeria Bottling Company , Trans Amadi. Port Harcourt, Rivers state.	2,000	120	6
2	Coca-Cola Nigeria Plc, Trans Amadi industrial layout, Port Harcourt, Rivers state.	6,000	320	5.3
3	Dangote Group	12,000	400	3.3
4	Indorama Eleme Petrochemicals, East-express ay Port Harcourt, Rivers state.	14,582	576	4
5	Guinness (Nigeria) Plc, 26 Trans Amadi industrial layout, Port Harcourt, Rivers state.	1,450	109	7.5
6	Festo Automation Limited, 48, Old Aba Road, Port Harcourt, Rivers state.	1,520	20	1.3
7	Alo Aluminium , East- Road, Port Harcourt, Rivers state.	1,750	42	2.4
8	Paboard Breweries Plc, Trans Amadi industrial layout, Port Harcourt, Rivers state.	1,332	390	29.3
9	Rockson Engineering, 67 Trans-Amadi industrial layout, Port Harcourt, Rivers state.	1,989	35	1.8
10	Champion Oilfield & solution Nigeria Limited, 9 Onitcha Road Port Harcourt, Rivers tate .	4,850	67	1.4
11	Stockgap Fuel Limited, Eagle Cement Road, Port Harcourt, Rivers State.	102	12	11.8
12	West African Glass industry – 134 Trans Amadi industrial layout, Port Harcourt, Rivers state.	5,000	44	0.9
13	Notore Chemical Industrie Plc, Notore Chemical Industrial Comple Onne Port Harcourt, Rivers state.	5,249	340	6.5
14	GGI International Limited, Plot 8 Ggi 22/24 Crescent, East Road, Port Harcourt, Rivers state	10,000	1690	16.9

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15	Seven Up Bottling Company 4 East – West Road Port Harcourt.	3,500	65	1.9
16	Etopo Energy Plc , Etopo House Sotonye Banigo street Port Harcourt, Rivers state.	233	14	6
17	Total Energies EP Nigeria Limited, Plot 25, Trans-Amadi Industrial Layout Port Harcourt, Rivers state	3,775	43	1.1
18	Heirs Energies Limited No. 71b Elelewo Street, GRA Phase 11 Port Harcourt, Rivers state	10,000	149	1.5
19	NNPC Gas Infrastructure Company Ltd. 5th Floor NNPC Zonal Office, 4-9 Moscow Road, Port Harcourt, Rivers State.	105	10	9.5
20	Hopeup Integrated Industries Nigeria Ltd. Plot 4-6 Dr Davie Ikanya Drive Off Bosike Road, Intel Port Harcourt/Aba Road, port harcourt Rivers State.	100	05	5
	TOTAL	78, 337	4, 451	5.7

The table 1 above shows total number of workers, the total number of mechanical technology education graduates among workers and their percentages in each of the 20 industries used for the study. The analysis shows that the highest number of mechanical technology education graduates among the employed workers is 1690 recorded by GGIC international limited. Representing 16.9 of its total work force. While the Pabaord Breweries had the highest percentage of mechanical technology education graduates among its staff, which is 29.3%. Glass industry has the least percentage of 0.9% of mechanical technology education graduates among its total number of 5000 workers. In summary, this result indicates a very low percentage of mechanical technology education graduates employed by the industries in Rivers state, which is 5.7%.

Q 3: Is there any significant impact of mechanical technology education to manpower development in River?

Table 2: Impact of Mechanical Technology Education to Manpower Development in River State

Variable	N	Mean	SD	df	Calculated(r)	Tabulated(r)	Rmks
Manpower Development	78,337	4276.85	4271.524	18	0.588	0.468	Sig.
Mechanical Technology Education	4451	222.55	383.354				

P< 0.05

The result in table 2 above reveals the contribution of mechanical technology education to manpower development in Riverssouth-west Nigeria. The table shows that the r-cal = 0. 588 > greater than the r-tab 0.468 at

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18 degree of freedom at the 0.05 level. The result indicates that technical and vocational education has significantly contributed to manpower development in south west Nigeria.

The results of this present study buttresses Enebe (2000), who asserted that this nation is in dire need of a good core of intermediate-level manpower in various industries to carry out their programmes. Craftsmen and technicians are the live wire of virtually all industrial activities. Without them, the machinery of industries will grind to a halt. Many industries are now being established in this country by both the private and public sectors of the economy and each of these industries depends mainly on the availability of craftsmen and technicians. Technical and vocational education (TVE) remains the popular means by which trained manpower is produced for economic and industrial growth of both developed and developing countries in the world. No wonder the Federal Republic of Nigeria, specifically stated in its National Policy on Education (2004) that, "Technical and Vocational Education is used as comprehensive term referring to those aspect of the educational process involving, in addition to general education, the study of technologies and related sciences and the acquisition of practical skills, attitudes, understanding and knowledge relating to occupations in the sectors of economic and social life".

Conclusion

The difficulties confronting the Nigeria and River in particular is wrapped in the key issues of economic growth and development, the solution lies in the use of technology such as the field of mechanical technology education to provide millions of jobs that is necessary to create massive employment for the people which is required in the reduction of social restiveness and idleness of the larger population of citizens, enhancing a better society and a peaceful River and the nation, which as a result of this attract further national development to River through foreign direct investments and local investment. Technological advancements have provided comfort and joy to life. Mechanical technology has a direct and vital impact on the quality of life for all citizens.

Recommendation

Based on the above findings, it is therefore recommended that the low human resource development in the country needs to be tackled through a coherent and comprehensive strategy that takes full account of the policy linkages and the country's implementation capacity. In an attempt to boost workforce skills through technical and vocational training, the interaction among educational attainment, workforce skills, population health and labour market laws and regulations must be taken into consideration.

The nation's universities, polytechnics, and colleges should be up and doing in exposing mechanical technology undergraduates to new ideas and technologies so as to be relevant in the world of work and integrate more quickly into the global economy, as businesses restructure their supply chain and operations to gain from regional comparative advantages.

Lecturer of mechanical technology education must be well grounded and possess the relevant skills that need to be imparted into their student.

Lastly, it is imperative to increase the number of Nigerian universities that will be running mechanical technology education as a course up to Ph.D. level so as to encourage candidates to choose the course. This is because very few universities in Nigeria have it as a course either at undergraduate or postgraduate level.

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