

METALWORK TECHNOLOGY AND MANPOWER DEVELOPMENT

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Abstract

This paper examined the place of metalwork technology in manpower development. The writer draws a relationship between metalwork technology and manpower development. The paper highlighted the contributions of metalwork technology to manpower development in areas such as sheet metalwork, metal spinning, structural steel work, pattern making, molding, millwright, polishing and buffing, tool making, heat-treatment, core making, foundry work, die making among others. Constraints to manpower development through metalwork technology such as lack of dynamic curriculum and inadequate funding were also highlighted. Based on the identified constraints, suggestions such as frequent review of curriculum and adequate funding were offered on the development of manpower through metalwork technology.

Introduction

Technical education, of which metalwork is a part, is that aspect of education, which involves the acquisition of techniques and application of the knowledge of the science for the improvement of man's surrounding. It deals with the training of manpower from professional category such as engineers and technologists through the technician down to the skilled category, which includes craftsmen and artisans.

The contribution of metalwork technology to the development of a nation cannot be disputed as this profession is embraced and recognized worldwide. Many nations have benefited in no small measure in the development of their various sectors of the economy through metalwork technology.

Metalwork Technology

According to Hornby (2001), metalwork is the activity of making objects out of metal in an artistic and skillful way. Technology is the study, mastery and utilization of manufacturing and industrial methods (Abdullahi, 1996). Technology is the systematic application of the knowledge of science to practical tasks in industry, the know-how of doing things. Metalwork technology as drawn from the above definitions is the application of scientific knowledge in the activity of making objects-out of metal in an artistic and skillful way. In other words, it is the totality of all the processes involved in the production of metal articles.

Manpower Development

Manpower development can be rephrased simply as developing the human resources for production, (Harbinson in Abdullahi, 1996). Manpower, not capital, not income, not material, constitutes the ultimate basis for wealth of nations - capital and material resources are passive production factors, human beings are the active agents who constitute wealth, exploit material resources, build social, economic and political organizations and carry out national development - a country that is not able to develop the skills and knowledge of its people and utilize them effectively in the national economy will be unable to develop anything else. No technology yet developed can substitute for the uniquely human qualities that men and women bring to the work place. Nations that can mobilize its manpower can achieve anything even with limited natural resources.

Acquisition of skills leads to manpower development. Manpower development is the process of increasing the knowledge, skills and capacities of all the people of the society, which can be achieved through training. Scgumache, (n.d); in Abdullahi (1998) believed that development does not start with goods, it starts with people and their education, organization and discipline. Without these three, all resources remain latent and untapped. In that same vein, Nwaokolo (2001) opined that there is no way a country can develop technologically without technical education. And there is no way technical education can grow without technical teachers. Teachers are the frontline implementers of any educational initiative. Japan knowing fully well that it had no natural resources went full blast to develop its manpower and that led to technology development in Japan. The Japanese "tiger" hi: conquered the world (Abdullahi, 1998).

Metahvork Technology and Manpower Development

Metalwork technology can be acquired through the established system with

planned curriculum. On the other hand, informal training for acquisition of skills, non-scholastic form a technical education, of which metalwork is a part, is acquired most probably through apprentices- 7 or through any other type of training outside the formal system (Iwuanyanwu, 1987).

Metalwork equips the recipients in the society with adequate practical skill needed to mc.-this country forward. It is important that every Nigerian needs economic understanding because ever, citizen faces economic problems of deciding how he or the government can utilize and allocate scarce resources available.

Technical education, of which metalwork is a part, is aimed at training and providing :h= necessary skills leading to the production of craftsman, technicians and other skilled personnel who will be enterprising and self-reliant (Federal Republic of Nigeria (FRN), 1981). Metalwork: technology deals with the training of manpower from the professional category such as engineers ar.: technologists through the technician down to the skilled category which includes craftsmen and artisans. Harbison (1964) contended that manpower resources can be developed on the job throu£-informal training programme like adult education programme and through cultural, social, religion and political groups.

The most efficient and prominent way is through the formal education at various levels that is primary, secondary and tertiary institution. Each of the different institutions where technical educative is given at various levels is important, and essential for technological development.

Ahmadu (1998) commented that one can be developed through the process of serf development. It is true that every individual aims to achieve greater heights in knowledge, skills ar.£ capacity by taking formal correspondence courses, which may be through renting or learning from other formal contacts.

Manpower is termed as the energies, skills, talents, and knowledge of the people which potentially can or should be applied to the production of goods or delivering of useful services. Manpower development is a form of capital investment. Any priority placed on manpower development is the proper and best means of producing the product of investment.

There is need to invest in human capital. Most nations in the present days are development minded, there is necessity to produce citizens that are capable of effectively functioning in the¹ modernization process.

Contributions of Metalwork Technology to Manpower Development

Metals play a greater role in almost everything we do all day, everyday. Newcomb and Kenrv-(1972) agree to this when they stated that when one turns on a faucet in the morning in order to **wash**, the person is making use of metal. We use metal spoon, fork, knife to eat our breakfast, which had been cooked, in metal pots. We go to our business by vehicles, trains, or bicycles. They too are made of metals. Electric lights, telephone, radio, television, computers and the like are all complex webs of metal wires and parts. Our buildings, both simple and complex ones each one of them has a skeleton of steel. Air-conditioning units, heating and refrigerators are among many other important modem gadgets that are made of metals. The number has no limit.

Metalwork trades are the various areas of specialization in metalwork technology. Metalwork technology is the totality of all the processes involved in the production of metal articles. The areas of metalwork technology are:

- i. Auto body repairs, which deals with the assembling of two or more parts by either spot welding, arc welding, soldering, and riveting;
- ii. Boiler making, which is concerned with the prefabricated parts made of iron and steel plates to make boilers, tanks, and machine;
- iii. Core making, this is a process of making cores to form holes or hollow parts in castings;
- iv. Die making, this is concerned with making metal forms or patterns, called dies which are used in punch process to stamp out forms in metal;
- v. Forging operation, this deals with heating of metal and shaping them by hammering while hot so as to produce local hoes, knives, arrows, cutlasses, rakes, among others;
- vi. Heat - treatment, which is concerned with heating and cooling of metals in the appropriate medium so as to modify their mechanical properties;
- vii. Jeweler, this is somebody who deals with making high-grade of jewelry of platinum, gold, and silver;
- viii. Machining, which is concerned with making precision metal parts, repairing and construction of machine tools;
- ix. Metal spinning, this deals with forming bowls, cups, trays, vases and other circular shapes by

- pressing flat pieces of sheet metal over form that turn on the lathe;
Welding, this is concerned with joining metal parts by melting them together with the use of oxyacetylene welding process, the electric arc welding - process, or with other welding processes while making burglary proofs for doors and windows of a building as a means of providing security, making chairs, windows, doors, water tanks, iron beds;
- xI. Sheet metalwork, this deals with the fabrication of funnels, cylinders, boxes, making and repairing of metal roofs, metal furniture and lockers;
 - xII. Millwright, this deals with the installation of heavy machines and equipment in shops, and construction of any special foundation for them;
 - xIII. Casting, this is concerned with the melting of metal by heating and pouring it in a prepared mold cavity to take the shape of the mold cavity in every detail e.g. cast aluminum pots, cast engine block of a car;
 - xIV. Polishing and buffing, it is a process of making use of abrasive discs, belts, or wheels to smooth metal, and buffing wheel to polish metal;
 - xv. Tool making, this deals with making and repairing of all kinds of special tools, cutting tools, jigs and gages. There are many careers in metalwork that can be used in developing manpower.

Constraints to Manpower Development Through Metalwork Technology

Among those problems militating against manpower development in metalwork technology include:

* **Technological Dependence:** According to Dawodu (2001) who lamented that the low productivity of manpower in Nigeria is due to over-reliance on imported technology. In that same vein, Abdullahi (1996) commented that the technology we are hankering after is western. It is the modern technology,, which has given the western world an immense power over land, sea and air. The above statement is undisputable because if not that the Nigerian government is so much depending on foreign technology, Nigerian government would have given much attention to the development of its manpower that would have taken Nigerian beyond where it is today in manpower development and technological advancement. Depending on foreign technology does not make a country technologically advanced just like wearing a magician's paraphernalia does not make you a magician.

* **Deplorable State of Training Institutions:** Institutions responsible for training manpower are faced with some major factors resulting from the quality of entrants, low level funding, inadequate training facilities, and staffing situation. These factors created a setback in manpower development. Also, the quantity of students who now gain admission in technical training institutions are worrisome. Most students who gain admission into technical training institutions are without adequate requisite qualification Mbata, 1990).

***Lack of Dynamic Curriculum:** A major material for carrying out training in our institutions is the curriculum. Jibodu in Ude (1996) stated that curriculum must be updated or reviewed in order to update knowledge and skills to match developments in commerce, science, technology and so on.

In the same vein Gaius (2001) opined that there is need for the curriculum of Technical Colleges to be reviewed in favour of skill/practical acquisition. The practical subjects need more space allocation and time allocation and credit unit allocation. Lack of curriculum review hampers keeping abreast with current issues of fast developing technology.

* **Negative Attitude of the Public Towards Technical Education in General and Metalwork in Particular:** Technical education is seen as a profession for dropouts, dirty and for those who could not perform or cope academically. The above statement is in consonance with that of Solarin in Abdullahi (1996) who stated that:

Once as Dr. Albert Schweitzer was dragging a heavy beam he noticed an African, in a white suit sitting near a patient whom he had come to visit, Schweitzer called, "Hello friend, won't you lend a hand?" "I don't drag wood about, I am an intellectual: Schweitzer replied, "How lucky you are. I have tried to be an intellectual too but didn't succeed" People with such notion about technical education will hardly accord any merit to the profession not to talk of giving a word of encouragement to their relations to be part of it.

* **Shortage of Qualified Personnel in Metalwork Technology:** Most of our training institutions qualified manpower that would really impart the skills needed for manpower development. The above statement was further amplified by Olalekan (2001) who lamented that Nigeria has not enough manpower or expertise to handle the machines, service and maintain them well and unavailable spare parts to replace damaged ones. All these factors can hamper the acquisition of skills that can help in developing manpower in metalwork technology.

* **Inadequate Funding of Technical Education Institutions:** Gana in Bodams (2003) lamented that while successive governments both at the federal and state levels have given priority to the establishment of science and technology institutions, proper funding of such institutions to produce quality graduates was lacking. Nigeria government is not properly funding the technical institutions in the country.

Recommendations

For effective manpower development in metalwork technology, the following suggestions are advanced:

- (1) The general public should change its negative attitudes towards technical education in general and metalwork in particular.
- (2) There should be enough trained and qualified personnel in Nigeria's technical institutions.
- (3) There should be frequent review of curriculum so as to keep abreast with the current technological issues.
- (4) Government attention should be focused on the training of its manpower and stop over-dependence on foreign technology and goods.
- (5) Institutions should be provided with adequate tools and equipment, so that pupil can acquire skills with joy. In this regards, funds should be made available for efficient running of technical programmes, so that our hope for manpower will be realized.

Conclusion

Education is a major generator of skills and knowledge for the labour force. It can thus influence attitudes, both positive and negative, towards work and commitment to national development.

The quality and quantity of manpower in any organization or nation determines how effectively other material resources could be fully utilized. Therefore investment in metalwork technology in all ramifications is a gateway to increased manpower development.

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