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CONTENTS

IPROVING THE PERFORMANCE OF STUDENTS OF METAL ORK TECHNOLOGY TOWARDS ATTAINMENT OF 'NEEDS' OBJECTIVES

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study was designed to identify strategies for improving the performance of metal technology students of Technical Colleges towards attainment of 'NEEDS' ernment Reform agenda) objectives .Three research questions and 3 hypotheses formulated to guide the study. A 28 item questionnaire was developed and used to d data from respondents consisting of 12-Teachers and 82-students of Technical ges in Niger state. The data was analysed using frequency count; mean and t-test stics. The study revealed that both the teachers and students share similar views ds the majority of the items. It was therefore recommended among others that a equipped workshop with tools, materials and machine tools should be provided as a of collaboration between government and private enterprises; utilisation of current rmation through the use of internet should be encouraged by the teachers and that of models and instructional aids in teaching of metal work should be emphasized by eachers.

oduction

ria society expects its education system to meet its aspiration, shape its future, and ide solution to some of its social, political and economic issues. National Economic powerment and Development Strategy (NEEDS) aims to restructure the government make it smaller, stronger, better skilled and more efficient at delivering essential ices. It seeks to transform the government from a haven of corruption to an itution that spurs development and serves the people. Education under 'NEEDS' is nsidered a key instrument to empower the children to take charge of their lives in ure. According to FGN (2004) the strategy will aim at the empowerment of the untry to acquire skills and knowledge that would prepare them for the world of work.

Today, Technical institutions have been recognised as good base for training illed manpower that can be effective in this country. Olaitan (1988), defined technical ucation as an effort to co-ordinate students and property to receive learning perience at the right time, using proper material and equipment needed to make that perience worthwhile.

Teaching of metal work in post primary schools encourages the acquisition of chnical skills in students, it encourages them to use their hands in making, repairing nd assembling spare parts. According to Adigun (1997), Technical education was

believed to be for the dropouts or low intelligent students. Metal working trade cannot be left out of this stigma as it is a component of Technical education. Onwuchekwa (2003) maintained that this tends to drive people away from studying this trade. Metal work Technology is very important in technological development of Nigeria, as there is hardly any product in use that has not been made by steel or steel machines. According to Encarta Encyclopaedia (2003), metal works are artistic work made of metal from precious to base fashioned by casting, hammering, joining or combination of these techniques.

Metal work Technology trades, which are taught at Technical college level, include foundry work, welding, motor vehicle body building, fabrication and mechanical craft practice (fitting & machining). It is expected that graduates of Technical colleges in metal work after completing the programme will be useful to themselves and society at large. According to NBTE (2003), the objective to be achieved by metal work technology students include to appreciate uses of simple tools, develop a creative behaviour, to have self realization and initiative, have the basic workshop skills and knowledge, be able to produce and weld simple tools, must have manipulative skill, be able to identify faults in machines and be able to repair them.

Isah (2003), remarked that building of well-equipped workshops is of utmost importance in most of the Technical colleges and Vocational centres in Nigeria, in other to achieve the purpose of skills acquisition for which they are set up. In the same vain Oranu (1992), maintained that adequate supply of workshop tools will facilitates training to prepare young people for work and skills required for operating machines and also provide such knowledge and skills that are required for technological development. Despite moves by government to achieve the aims of being self reliant, the performance of students is declining in Technical Colleges in Niger state. Evidence from Niger State Science and Technical Schools Board revealed that 93.4% pass was recorded in May/June 2003 National Technical Certificate (NTC) result of Technical Colleges in Niger State, 92% in 2004, 90% in 2005 and 87% in 2006, this shows decline in students performance. Atsumbe (2004), maintain that most of our institutions today do not furnish their students with minimum training to fit them for productive work. He stressed that most industries reject the students because they are not aware of what the institutions are doing. This therefore called for immediate action in order to attain 'NEEDS' objectives.

Purpose of the study

The study sought to find out:

1. Current state of tools and equipment for teaching and learning of metal work in Technical colleges of Niger State.
2. Factors that will facilitate good performance of students in metal work.
3. The strategies for improving the teaching and learning of metal work.

Research Questions

In order to achieve the objective of this study the following research questions were postulated:

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1. What is the current state of tools and equipment for teaching and learning of metal work in Technical colleges of Niger State?
2. What are the factors that will facilitate good performance of students in metal work?
3. What are the strategies for improving the teaching and learning of metal work?

Hypotheses

The following 3-null hypotheses were stated and tested at 0.05 level of significance in other to guide the study.

H_{O1} There is no significant difference in the mean responses of Teachers and students on the current state of tools and equipment for teaching and learning of metal work in Technical Colleges of Niger State.

H_{O2} There will be no significant difference in the mean responses of teachers and students on the factors that will facilitate good performance of students in metal work.

H_{O3} There is no significant difference in the mean responses of teachers and students on the strategies for improving the teaching and learning of metal work.

Method

This section describes research design, area of the study, population, sample and sampling techniques, instrumentation, and method of data analysis used for the study.

Design

A descriptive survey research was used to seek the opinion of metal work teachers and students on the performance of students of metal work technology in the Technical colleges of Niger state.

Area of the study

This study covered all Technical Colleges in Niger State. Niger State is located in the present North Central Geo-political Zone of Nigeria.

Population

The target population for the study consisted of 18-metal work teachers and 117-metal work students in Technical Colleges of Niger state.

Sample and Sampling Technique

Sample of 82-metal work students were drawn from population using random sampling technique, while all 12-metal work teachers that completed and returned the questionnaire were used for the study.

Instrumentation

A structured questionnaire was the sole instrument used for the collection of data. It was divided into sections A – C based on the research questions. The sections contain 8, 10 and 10 items as shown in tables 1, 2 and 3 respectively. The instrument there fore

consisted of a total of 28 items, rated on a four point scale of strongly agree, Agree, Disagree, and strongly disagree.

Method of Data Analysis

The data was analysed using frequency count, mean, and t-test for all the 3-research questions and hypotheses posed for the study. The cut off point for the mean was fixed at 2.50 being the average of 4 point scale used for the study. Therefore any item that is within a mean range of 2.50 and above was regarded as agree, meaning that items are relevant strategies for improving the teaching and learning of metal work, while any mean below 2.50 was regarded disagree/ irrelevant strategy.

Result

The result of the data analyses are presented in the order of research questions and hypotheses posed for the study.

Research Question 1

What are the current state of tools and equipment for teaching and learning of metal work?

Table 1 shows the responses of both teachers and students on the current state of tools and equipment for teaching and learning of metal work.

Table 1: Responses of teachers and students on current state of tools and equipment for teaching and learning of metal work.

$N_1 = 12$ $N_2 = 82$

S/No	ITEMS	$\bar{X}_1$	$\bar{X}_2$	$\bar{X}_t$	REMARKS
1	The schools have adequate tools and equipment for practical	2.15	2.30	2.23	Disagree
2	Hand tools like hacksaw, file etc. are available for use in the school workshop	2.56	2.54	2.55	Agree
3	Several machine tools such as lathe, shape, etc. are readily available for use.	2.11	1.99	2.05	Disagree
4	Materials provided are adequate for effective teaching of metal work.	2.20	2.10	2.15	Disagree
5	The utilisations of the facilities provided are encouraged.	3.20	1.40	2.30	Disagree
6	Several operations are usually performed using available tools and equipment.	2.22	1.68	1.95	Disagree
7	Some tools are usually improvised as a result of non availability.	3.15	2.58	2.87	Agree
8	Adequate maintenance is provided for and equipment.	3.20	3.50	3.35	Agree
	Grand mean	**2.60**	**2.26**		

Key: N_1 = Number of Teachers, N_2 = Number of students, $\bar{X}_1$ = Mean of teachers $\bar{X}_2$ = Mean of students, $\bar{X}_1$ = Average mean of teachers and students.

Table 1 revealed that the two groups of respondents agreed with items 2, 7, and 8 with mean of 2.55, 2.87 and 3.35 respectively; while they disagreed with other 5-items with mean ranging from 1.95 – 2.30. This indicates a terrible state of tools and equipment for teaching and learning of metal work.

Research Question 2

What are the factors that will facilitate good performance of students in metal work?

Table 2 revealed the responses of both teachers and students on factors that will facilitate good performance of students in metal work.

Table 2: Responses of Teachers and Students on factors that will facilitate good Performance of Students in metal work.

$N_1 = 12$ $N_2 = 82$

S/No	ITEMS	$\bar{X}_1$	$\bar{X}_2$	$\bar{X}_1$	REMARKS
9	Rewarding students with outstanding performance in metal work with text books.	3.61	2.40	3.51	Agree
10	Equipped library for staff and students	2.92	3.46	3.19	Agree
11	Use models and instructional aids in teaching of metal work.	3.06	2.88	2.97	Agree
12	Availability of professionally qualified teachers of metal work.	3.54	3.25	3.40	Agree
13	Encouraging teachers to embark on further training.	2.55	3.02	2.79	Agree
14	Having teachers that are dedicated to duties.	2.63	2.41	2.52	Agree
15	Regular workshop practice on all topics taught.	3.06	3.62	3.34	Agree
16	Enlisting students of metal work into appropriate industrial work experience.	3.25	2.15	2.70	Agree
17	Paying stipends to metal work students.	2.32	3.82	3.07	Agree
18	Provision of a well equipped workshop with tools, materials and machine tools.	3.70	3.50	3.60	Agree
	Grand mean	**3.06**	**3.05**		

Information on table 2 revealed that all the factors outlined will facilitate good performance of students in metal work as they were all agreed to with mean ranging between 2.52 and 3.60. The two respondents seem to believed in provision of a well equipped workshop as it has highest mean of 3.60.

Research Question 3
What are the strategies for improving the teaching and learning of metal work?

Table 3 shows the responses of teachers and students on the strategies for improving the teaching of metal work.

Table 3: Response of Teachers and Students on Strategies for Improving the Teaching and Learning of Metal work.

$N_1 = 12$ $N_2 = 82$

S/No	ITEMS	$\bar{X}_1$	$\bar{X}_2$	$\bar{X}_t$	REMARKS
19	Provision of classroom facilities and tools for teaching metal work.	2.84	2.66	2.75	Agree
20	Allocation of funds for maintenance of tools, equipment and machines.	3.51	2.15	2.83	Agree
21	Provision of machine tools such as lathe, shape, Grinding, Drilling and milling.	2.64	2.70	2.67	Agree
22	Regular seminars/workshops for the teachers of metal work.	2.52	2.68	2.60	Agree
23	Regular payment of teachers' salary and other allowances.	3.66	3.04	3.35	Agree
24	Utilising current information through the use of internet.	3.82	3.61	3.72	Agree
25	Purchasing relevant text books, tools, equipment, machines and materials.	2.89	3.02	2.96	Agree
26	Constant supervision of teachers and students practical classes.	2.15	3.12	2.79	Agree
27	The use of improvised instructional aids should be encouraged.	3.42	3.64	3.53	Agree
28	The use of small scale industrial resource persons, such as road side welders and panel beaters.	3.70	3.60	3.65	Agree
	Grand mean	**3.12**	**3.02**		

Table 3 revealed that respondents agreed that all the strategies outlined for improving the teaching and learning of metal work is relevant. They were all agreed with mean ranging from 2.60 – 3.72 although students disagreed with item 20, the two respondents strongly believed in utilizing current information through the use of internet as it has highest mean of 3.72.

Hypotheses Testing

The 3-null hypotheses tested at 0.05 level of significance are presented in table 4, 5, and 6 to determine whether differences exist between the responses of teachers and students of metal work technology.

Table 4: T-test of Difference between Teachers and Students on Current State of Tools and Equipment for Teaching and Learning of Metal work.

Group	X	S.D	N	df	t_c	t_v	Decision
Teachers	2.60	1.17	12	92	1.06	1.98	Accepted
Students	2.26	0.98	82				

Key: X = mean, S.D =Standard deviation; t_c = t-calculated; t_v = t-table value df = degree of freedom; N = Number of respondents.

Table 5: T-test of Difference Between Teachers and Students on Factors that will Facilitate Good Performance of Students in Metal work.

Group	X	S.D	N	df	t_c	t_v	Decision
Teachers	3.06	1.05	12	92	0.03	1.98	Accepted
Students	3.05	1.09	82				

Table 6: T-Test of Difference Between Teachers and Students on Strategies for Improving the Teaching and Learning of Metal work.

Group	X	S.D	N	df	t_c	t_v	Decision
Teachers	3.12	1.11	12	92	0.29	1.98	Accepted
Students	3.02	1.08	82				

Table 4,5, and 6 revealed that the t-calculated are less than the table value of t, the results of this tests suggest that the difference between the scores of teachers and students on the research questions are not statistically different. It is therefore concluded that there is no significance difference between the mean scores of the teachers and students, null hypotheses were then accepted for the 3-research questions.

Findings/Discussion

Analysis on table 1 shows that respondents agreed with 3 items and disagreed with 5 items. This reveals that hand tools are available for use in the school workshop, some of which are usually improvised as a result of non-availability and that adequate maintenance is provided for tools and equipment, but materials provided are inadequate for effective teaching of metal work, several machine tools are not readily available. Table 4 also shows that the null hypothesis was not rejected. It is pertinent to note here that materials/tools needed for skill development in metal work are not available. This according to Ejiogwu (1994) resulted because the resources at government's disposal is dwindling, and have to be rationed out to competing demands, beckoning for urgent

attention. Hence, government is never in position to satisfy the demand for all sectors including education.

A close look at table 2 revealed that all factors high-lighted to facilitate good performance of students in metal work were agreed to, with varying degrees of acceptance. Respondents believed in rewarding students with outstanding performance, having qualified teachers to handle metal work and provision of well equipped workshop with tools, materials and machine tools, as they were rated high. The finding in table 6 with regard to null hypothesis was not rejected. This is in agreement with work of Onwuchekwa (2003), who observed that workshop/laboratory plays important role in instructional activities in metal work and contended that with introduction of entrepreneurial courses in curriculum of Technical College metal work trades, graduates of metal work trades will be equipped with knowledge and skills necessary for them to manage small-scale enterprises. In the same vain Oranu (1992), maintained that adequate supply of workshops tools will facilitates training to prepare young people for work and skill required for operating machines and also provide such knowledge and skills that are required for technological development.

This study also revealed that encouraging teachers to embark on further training, regular workshop practice on all topics taught and the use of models and instructional aids in teaching of metal work will facilities good performance of students in metal work. This is in line with Oderigive, (1970), who stressed the importance of instructional facilities in schools and emphasized that effective implementation of metal work technology programme can be done by adequate supply of instructional materials to good practical training.

The findings of this study as revealed in table 3 shows that several strategies could be adopted for improving the teaching and learning of metal work trades. The finding in table 6 with regard to null hypothesis was accepted. It is important to emphasis that greater priority was laid on utilising current information through the use of internet and the use of small scale industrial persons such as road-side welders and panel beaters. This seems to be in line with the current government reform agenda where participation of private sector in the economy through the use of small and medium enterprise investment equity scheme (SMIES) was emphasized (FGN, 2004). This is also in line with Adebayo (2003), who emphasised partnership between education and industries in order to develop competence in students and make them a responsible citizenship with a focus in entrepreneur's skills. From the fore going, it is evidently clear that Nigeria as a nation should emphasise functional education capable of turning our economy around and ensuring self reliance.

Recommendations

Based on the findings of this study the following recommendations were made:

- As a matter of urgency well equipped workshop with tools, materials and machine tools should be provided as a result of collaboration between government and private enterprises.
- Students with outstanding performance in metal work should be rewarded with textbooks by appropriate authorities.

The use of models and instructional aids in teaching of metal work should be emphasised by the teachers.

The utilisation of current information through the use of internet should be encouraged by the teachers.

There should be collaboration in the use of small scale enterprises as resources persons in teaching metal work.

Teacher's salary and other allowances should be paid regularly.

Professionally qualified teachers of metal work should be employed.

Conclusion

It is quite clear that the needed type of education in Nigeria is a functional type of education in which students will acquire a specific skill in order to be self-reliant. This has been emphasised in this study. Much can not be said to have been achieved in the past programmes. It is hope that 'NEEDS' as government reform Agenda will operate in order to carry all sectors of education along, particularly metal work trades so as to turn the economy around.

References

...S.A (2003). Managing Technical College Programmes for Self-reliance: A Challenge to Democratic Government of Nigeria. In N. G. Nneji, M. A. A. Ogunyemi, F. O. N. Onyeukwu, M. Ukponson, and S. O. Agbato, (Eds.), **Technology Education in a Democratic Nigeria. 16th NATT Conference Proceeding.**

... A. O. (1997). **Introduction to Vocational and Technical Education (with Principles and Methods of Teaching Skills)**. Lagos: Raytel Communication (Nig) Ltd.

...umbe, B. N. (2004). Impact of SIWES on Practical Skills Development of Mechanical Students' of Industrial and Technology Education. In O. K. Abubakre, B. A. Alabadan, and O. D. Adeniyi. (Eds). **5th Annual Engineering Proceedings**. 16th –18th June. F U T, Minna.

...gu, A. M. (1994). **School Personnel Management: A Nigerian Perspective**. Lagos: University Press.

...Encyclopaedia. (2003). Vol. 7, 228.

... (2004). **National Economic Empowerment and Development Strategy Blue-Print.** Abuja: National Planning Commission.

... M. P. (2003). Effective Management of Workshop Resources in Vocational/Technical Education for National Development. In N. G. Nneji, M. A. A.

Ogunyemi, F. O. N. Onyeukwu, M. Ukponson, and S. O. Agbato, (Eds.) **Technology Education in a Democratic Nigeria. 16th NATT Conference Proceeding.**

NBTE (2003). **National Technical Certificate (NTC) and Advanced National Technical Certificate (ANTC) Programmes, Curriculum and Module Specifications**. Kaduna: NBTE Publication Unit.

Oderigive, B. (1970). **Selection, Utilisation and Evaluation of Instructional Media** Ibadan: Spectrum Books Ltd.

Olaitan, S. O. (1988). **Vocational and Technical Education in Nigeria (Issues and Analysis.** Onitsha: Centre Educational Publisher.

Onwuchekwa, A. K. (2003). Introducing Entrepreneurial Course in Technical College Metal Work Trades for Effective Preparation of the Recipients for Self-reliance in a Democratic Setting. In N. G. Nneji, M. A. A. Ogunyemi, F. O. N. Onyeukwu, M. Ukponson, and S. O. Agbato, (Eds.) **Technology Education in a Democratic Nigeria. 16th NATT Conference Proceedings.**

Oranu, R. N. (1992). Vocational Education and Manpower Development. In E. U. Anyakoha and R. N. Oranu (Eds), **Vocational/Technical Education and Manpower Development**. Nigeria Vocational Association. 1-4.