
PERCEIVED USEFULNESS OF IMPROVISED INSTRUCTIONAL MATERIALS FOR TEACHING MOTOR VEHICLE MECHANICS (MVM) TRADE IN TECHNICAL COLLEGES IN GOMBE STATE

By

Yakubu Salihu

Automobile Technology Department

School of Technical

FCE (T) Gombe

ysggadam@gmail.com

Abstract

The study was conducted to determine the perception of the usefulness of improvised instructional materials for teaching Motor Vehicle Mechanics (MVM) trade in technical colleges in Gombe State. Descriptive survey research design was employed in providing a means for generalization. Proportionate stratified random sampling was used to select 140 respondents, which represents a sample from 300 respondents. A structured questionnaire having a four point rating scale was used for the collection of data. Data was analyzed using mean and standard deviation. Findings reveals that respondents did not agree that visual display of vehicle components on cardboard papers, used of improvised materials from wood for parts identification are not appropriate for used as instructional materials required for teaching MVM trade. Based on the findings, the study recommended that, MVM trade teachers should employ the use of an improvised instructional materials for teaching, and are encouraged through provision of trade specific materials for instructional purposes among others.

Key words: Improvisation, Instructional Materials, Improvisation of Instructional Materials, Teaching Motor Vehicle Mechanics Trade.

INTRODUCTION

Federal Republic of Nigeria (2013) in its National Policy on Education (NPE) describes technical education as a comprehensive term referring to those aspects of educational process involving, in addition to general education, the study of technologies and related sciences and the acquisition of practical skills, attitude, knowledge relating to occupation in various sector of economic and social life. The above policy statement on technical education can be achieved though the following objectives:

- i. Provision of technical knowledge and vocational skills necessary for economic development.
- ii. Providing people who can apply scientific knowledge to the improvement and solution of environmental problems for the use and convenience of man.
- iii. Provide trained manpower in apply science technology, commerce particularly at sub-professional level.
- iv. Enable young men and women to have an intelligent understanding of increasing complexity of technology.

Based on the above policy objectives, Motor Vehicle Mechanics (MVM) trade as a programme offered at technical college level is designed to train competent artisan, craft men and technicians in the occupational trade. Training in MVM trade is pragmatic, that is, learning by doing (Olaitan, 1999). Training can be seen as a skill acquisition process through which graduate are taught new knowledge and skills and how to apply them (Onuka, 2008). Motor Vehicle Mechanics (MVM) as a technical education programme require training that involve vehicle maintenance, inspection, adjustment, installation and repairs of automobile engines, engines accessories, electrical systems and power transmission (Erjavee, 2010). Onyejemezi (1998) stressed that MVM trade provides the necessary training in both theory and practice on vehicle and machineries. Learners in the trade area are expected to be taught/trained using appropriate and relevant instructional training materials in the learning process in and outside workshop environment. As such instructional learning materials are the basis for a fundamental instructional purpose in achieving the desired learning objectives.

Instructional materials are fundamental to achieving effective learning outcomes. Jimoh (1997) observes that instructional materials are important towards presenting facts and when properly put into use provides a permanent learning. Agun (2002) pointed out that materials used for instruction in teaching includes audio-visuals aids, tools equipment, machines, charts, diagrams and Information Communication Technology (ICT) resources. Instruction materials can also be considered to mean all form of information carriers which can be used to record, store, preserve, transmit, concretize or retrieve information and knowledge for learning purpose (Abdulkadir, 2011). It is clear that instructional materials are aids in making learning more meaningful.

MVM trade requires that teachers provide a learning environment that promotes effective knowledge,

attitude and skills. Such environment demand utilization of available learning materials that promotes a functional learning. Instructional materials required in teaching MVM trade includes models, simulators, diagrams, charts, machines, tools and electronics equipment that make teaching of motor vehicle mechanics trade easier. However, absence of instructional materials in teaching process in MVM trade subjects will not promote a functional outcome. Orji and Abolarin (2012) stressed that students' poor performance is based on the inability to provide variety of instructional materials in the teaching and learning. Based on usefulness derived from the use of variety of instructional materials in teaching MVM, the present situation unveils scarcity and inadequate instructional materials in most Technical Colleges. This situation has now force administrators in technical colleges to promote improvisation of instructional materials by providing local materials needed based on National Board of Technical Education (NBTE) curriculum standard, in which MVM trade teachers are expected to develop local instructional materials that will assist improve instructional delivery process.

Teachers according to Eniayeju and Eniayeju (1999) are to improvise equipment designed by them to meet the need of teaching or learning situation for practical skill acquisition. Improvisation is a venture for promoting curiosity, mental alertness, endurance and preference (Balogun, 1980, Olarewaju, 1994 and Johnson, 2002). Agbale (1993) put forward the following as reasons that influence improvisation:

- i. Change in the nature of knowledge or content of education
- ii. Change in the teaching process
- iii. Change in the learning process
- iv. Most importantly change in the societal values.

The above desired changes make it imperative to improvise materials for instructional purposes. Changes

in the current MVM curriculum where a lot of electrical/electronic systems are incorporated require display of audio visuals processes thus require changes in the teaching/learning process. Operating systems on vehicles such as fuel system, ignition system, cooling and other systems are importantly presented to learners when they are taught with models, clear charts/diagrams and simulators that are designed using locally produced materials from the immediate environment. Learners taught using instructional models automatically acquire knowledge and information necessary to promote practical understanding better than the ordinary lecture and explanation that uses the chalk board. Such use of the old traditional learning process is perceived by learners as an abstract phenomenon that does not provide meaningful information on systems on vehicle. Motorized operating models that uses the electrical system and also electronics such as the one use in operating electric fan for cooling system, gauges, electrically operating, door light, alarm system for vehicle security, brake light, head light and many others can be improvised using common local materials to build the circuit and with the use of simple bulbs and flashers that act the same way as on the vehicle main components. The main idea is to simplify and promote concrete learning outcomes on operation of some working systems to the learners where such main components are not adequately provided.

Simulators provides and assist in demonstrating the same movement as how the main vehicle operate but for demonstration purposes, which will provide a basic foundation on the understanding and prepare the learner for practical skill training during industrial training scheme in to the real world of work. Slides used in teaching and learning process and construction of functional and vehicle operational systems such as braking system and spark ignition system assist in providing a clear explanation on

operation when such components are put into class room instruction to learners.

Functional knowledge of the learner in MVM trade is the major concerned of every MVM teacher in technical colleges. Inability of MVM teachers in the improvisation of instructional materials not only affect performance of the learner but promote poor quality students that cannot pursue further educational qualification. Generally, such situation affects the rate of students' performance in the trade. Therefore, the study seeks to determine improvisation of instructional materials in the teaching of motor vehicle mechanics trade in technical colleges in Gombe State.

Purpose of the study

The main purpose of the study was to determine perception of administrators, teachers and students on usefulness of improvised of instructional materials in teaching of motor vehicle mechanics trade in technical colleges in Gombe State. Specifically the study seeks to determine:-

- i. Appropriateness of improvise instructional materials used in teaching MVM trade.
- ii. Impact of improvise instructional materials used in teaching and learning MVM trade.

Research Questions

The following research questions guide the study

- i. To what extend do improvised instructional materials used in teaching MVM trade are appropriate for learning?
- ii. To what extend do improvised instructional materials used in teaching MVM trade make impact on the students' learning?

METHODOLOGY

The research design employed in this study was a descriptive survey design for generalization. Two purposes were formulated and two research questions were developed and answered. The population consists of 300 respondents comprising of administrators, teachers, and students. Proportionate stratified random sampling was used to select 140 respondents that represent the population for the study. Structured questionnaire having a four point rating scale was used to collect data. The instrument comprises section A and B each having 10 item statements each of strongly agreed, agreed, disagreed and strongly disagreed with corresponding value of 4, 3, 2, and 1 respectively. The instruments was validated by two experts from school of

technical FCE (T) Gombe and tested for reliability using Cronbach Alpha which yielded a reliability coefficient of 0.81. All the instruments administered were completed and used for data analysis. Mean and standard deviation were used for answering the research questions. Based on the four point rating scale, any item with a mean of 2.50 and above is accepted while any mean less than 2.50 is regarded as not accepted.

RESULTS

Research Question I:

To what extend do improvised instructional materials used in teaching MVM trade become appropriate to the learners?

Table I: Mean ratings on the appropriateness of improvised instructional materials in teaching MVM trade subject

S/N	QUESTIONNAIRE ITEMS	\bar{X}	SD	DECISION
1.	Construction of a functional models used to explain the cooling system of engine operating on vehicles	3.07	1.05	Agreed
2.	Construction of functional models for hydraulic braking system on a Platform to describe how the system operates.	3.11	0.99	Agreed
3.	Use of charts to describe circuit diagrams for various vehicles electrical systems	3.24	0.84	Agreed
4.	Construction of variety of separate circuits on a platform using local materials to describe the operational principle in a vehicle	3.11	0.99	Agreed
5.	Computer audio visual display of steps involve in a particular vehicle system operation	3.03	0.96	Agreed
6.	Visual display of vehicle components on card board paper.	2.01	1.02	Disagreed
7.	Use of the vehicle parts from scraps to explain on various components and their uses	3.40	0.99	Agreed
8.	Use of a scrap engine for practical training by Students in the workshop	3.35	0.96	Agreed
9.	Inviting an entrepreneur on specific skill related Expert in motor vehicle works to demonstrate			

Particular skill area need for training	3.50	1.05	Agreed
10. Use of wooden materials for learners to identify vehicle components and positions on the vehicle to beginners of the MVM trade	2.40	0.95	Disagreed

Table 1 presents the mean responses of administrators, teachers and students on the appropriateness of improvise instructional materials used in teaching MVM trade in technical colleges in Gombe State. From the table, eight (8) out of ten (10) statement items, had a mean range of 3.07 to 3.50, the mean were above the cut-off of 2.50. This implies that the respondents agreed on the appropriateness of 8 statement items on improvisation of instructional materials for teaching MVM trade subjects. The standard deviation of the 8 statement items ranged from 0.84 to 1.02, which shows that the respondents response were close to one another and also were not far from the

mean, questionnaire items 6 and 10 had a means of 2.01 and 2.40 respectively, which are below the cut-off mean of 2.50. This shows that visual display of vehicle components on card board papers and the use of wooden materials to construct block diagrams of vehicle components are not appropriate enough to serve as an effective improvise instructional material for teaching MVM trade in technical colleges.

Research Question 2:

To what extend do improvised instructional materials in teaching MVM trade make impact on the learners?

Table 2: Mean ratings on the impact of improvised instructional materials in teaching and learning MVM trade in technical colleges in Gombe state.

S/N	QUESTIONNAIRE ITEMS	\bar{X}	SD	DECISION
1.	They provide useful source of information to the learners	2.86	0.79	Agreed
2.	Their effectiveness saves teachers time.	3.09	1.09	Agreed
3.	They provide MVM trade teachers with interesting platform for conveying information	3.36	0.82	Agreed
4.	They help teachers overcome physical difficulties that could have hindered his effective presentation on a particular topic	3.24	0.84	Agreed
5.	They facilitate different learning style	2.40	1.00	Disagreed
6.	They stimulated learner interest and curiosity	3.09	0.99	Agreed
7.	The promotes understanding MVM trade Subjects effectively	2.35	0.85	Disagreed
8.	They explain ideas and describe operations to learners.	3.10	1.00	Agreed
9.	They motivate learners in the MVM trade to learn.	3.25	1.10	Agreed
10.	They reinforce ideas and understanding of the subject matter	3.50	0.89	Agreed

Data presented in table 2 show that eight (8) out of ten (10) questionnaire items had their mean ranging from 2.86 to 3.50, which falls within the response categories that agreed on the impact of improvise instructional materials in teaching and learning MVM trade in technical colleges in Gombe State. The standard deviation for those items ranges from 0.79 to 1.10. This implies that the respondents are homogenous in their responses. Questionnaire item 5 and 7 had a means of 2.40 and 2.35 respectively, which are below the cut-off mean of 2.50.

DISCUSSION OF FINDINGS

The findings of the study in table 1 revealed that visual display of vehicle components on card board papers and the use of wooden materials for the improvisation of diagrams to represents vehicle components in block diagram does not portray practical skill training in MVM. Only improvise equipment and machines that meet the need in teaching for practical skill acquisition (Enjayeju and Eniayeju, 1999). Some improvise instructional materials only serve in providing information but does not provide opportunity for skills acquisition. Teaching and learning basically in MVM trade is pragmatic that is learning by doing (Olaitan, 1999). Thus, combination of knowledge, attitude and skills is paramount.

The study revealed that the respondents agreed on the appropriateness in the use computer audio-visual display of practical steps involve in vehicle system operation, construction of functional circuits found in vehicle operation using simple bulbs and working components that can provide a replica of the operational pattern with that found on vehicles. Construction variety of functional vehicle models on plat form for teaching and learning purposes. This is in agreement with the assertion by Onyejemezi (1998) that training in MVM trade is provided in both theory and practice where machines and equipment are utilize.

The findings of the study as shown in table 2 revealed that the impact of improvise instructional materials promote in providing source of information and conveying ideas to the learners. Through, teaching MVM trade require more in demonstration and activity centered learning but information and presentations are reinforced and provides impact on learning though the use of instructional materials. Improvise instructional materials provides variety in presenting to the learner the task involve and the information required in terms of safety, selection of materials and engineering information of materials involve. This is line with Jimoh (1997) who sees instructional materials as important in discovering facts and information in a learning situation. In the same vein, Johnson, (2002) stressed that improvisation of instructional materials promotes learners curiosity and mental alertness to learning. Therefore improvisation of instructional materials have a positive impact on the learners of MVM trade subjects towards providing information, ideas that help in learning practical skills.

CONCLUSION

This study has assessed some of the use of improvisation of instructional materials for teaching MVM trade subjects in technical colleges. Practical skill training is the major focus in teaching MVM trade where the demand is on pragmatic approach, that is, learning by doing. Academic achievement of MVM trade students can be improve though the provision of meaningful ideas, information and knowledge on how best they can learn the requisite skills in the trade area. Instructional materials are capital intensive thus require administrators and teachers to improvise for effective learning outcome.

RECOMMENDATIONS

The following are recommended based on the followings

1. Technical college Administrators should use these identified appropriate improvise instruction materials for teaching MVM trade in the provision of local materials for the construction to simplify teaching process.
2. In technical college should use these identified improvise instruction materials in teaching MVM trade as they impact better on learners' ability to learn.
3. Government and non-governmental Organisation should consider in providing those identified improvise instructional materials for teaching MVM trade to technical colleges to ease the problem of teaching and learning.

REFERENCES

- Abdulkadir, M (2011). Assessment of teaching learning practices in practical motor vehicle mechanics works at technical college level in Niger state. *Unpublished M.Tech thesis*. Federal University of Technology, Minna.
- Agbale, D. O. (1993). Educational innovations. *New Nigeria*, Friday 26th march and july, 16th 1993.
- Agun. I. (2002). Importance of Audio visual instruction. *West African Journal of Education* 20 (2).
- Balogun, T. A (1980). *Improvisation of social science teaching equipment*. Ibadan Teacher Education
- Enemali, J. D. (2010). Education and training for industrialization. Ibadan stirring-horden publisher
- Eniayeju, P. A. & Eniayeju, A. A. (1999). STM teachers Disposition toward practical activities development and validation of an evaluation tool. A paper presented at the 2nd national Conference of the school of Education, F.C.E kano from 9th -22nd October (1999)
- Erjavee, R.C. (2010). *Automobile Technology: A System Approach*. 5th Edition. United Kingdom: Delmar Cengage Ltd.
- Federal Republic of Nigeria (2013). *National Policy on Education*. (4th Edition) Lagos: Nigerian Educational Research council (NERC) press.
- Jimoh, J (1997). Auto mechanics skills needed by technical collage motor vehicle mechanics graduates in Bauchi and Gombe state. Un published M: tech (ed) thesis. Vocational and Technology Education Programme. ATBU Bauchi.
- Johnson, S. I. (1994). Improvisation and lowcost production for science education. A paper presented at Room 803, F.C.E Kano. At school of Science seminar series, F.C.E. Kano, 30th September, 1994.
- Olaitan, S. O. (1996). Vocational and Technical Education in Nigeria (issues and Analysis). Onitsha: Noble Graphics press.
- Olarewaju, A. O. (1994). Improvisation in integrated Science teaching. Ibadan: Alafas Nigeria company ltd.
- Onuka, A. U. (2008). Development of entrepreneurial skill training modules for enhancing youth participation in regulated cassava processing occupation in south east, Nigeria. *Unpublished Ph.D. thesis*, Department of vocational teacher Education, university of Nigeria, Nsukka.

Onyejemezi, O. E. (1998) *Practical instructional materials*
retrieved January, 2015 from
<http://www.google.com>

Orji, U.E. & Abolarin E. (2012). Strategies for enhancing
teacher competence and quality of classroom
instruction. *Global Voice of Educators*, 1(1) 1.E.

Owoh, T. M. (2009). Availability of instructional materials
for teaching of MVM trade in Enugu state.
Ebonyi Technology Education Journal 3(1); 118-
121.