

Improving Teaching and Learning of Motor Vehicle Mechanic Trades Through the Use of Information and Communication Technology (ICT) at Technical College Level

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Abstract

The use of ICT in education in any country depends largely on the computer technology awareness in that country. With the overwhelming influences of ICT on vocational technical courses which motor vehicle mechanic trades is an integral part of, most teachers are not computer literate, rather they still depend on the tradition of world of papers, this of course has affected the attainment of the objective of vocational technical education. Therefore, this paper focuses attention on the improvement of teaching and learning of motor vehicle mechanic trades through the use of ICT at technical college level. The paper discussed the concept of ICT, teaching and learning, teaching methods as well as the need for ICT in teaching and learning of motor vehicle mechanic trades. It was recommended among others that there should be integration of ICT into both classroom and workshop activities in all technical colleges, Government should make provision for staff development and should make funds available for ICT implementation.

Introduction

Motor Vehicle Mechanics work is one of the vocational technical education programmes which involve the acquisition of scientific knowledge in design, selection of materials, construction, operation and maintenance of motor vehicles. The skilled areas in motor vehicle mechanic trades includes: auto electricity, vehicle body building, air conditioning and refrigeration (Abubakar, 2007). However, in the words of Doyin (2004) Motor vehicle mechanics work is a vocational programme, and a vocational programme is all preparing one for a specific occupation. Similarly, Ugwaja (2010) opined that vocational programmes are generally designed to

prepare individuals for gainful employment as semi-skilled or skilled worker or technicians or sub-professional in recognized occupation and in new and emerging occupations or to prepare individual for enrolment in advanced technical education programmes. Motor vehicle mechanics work at technical colleges consists of three components/subjects grouping as: Service Station Mechanics work, Engine Maintenance and Refurbishing and Auto Electricity.

The programme of motor vehicle mechanics trade in Nigeria technical colleges is designed to produce competent motor vehicle craftsmen for Nigeria

technological and industrial development (Aruku, 2007). The objective of motor vehicle mechanics trade is to enable technical college graduates to test, diagnose service and repairs and fault relating to

Conventional motor vehicle assembly and system to the manufacturer's specification (NBTE, 2001). The work practice covers the major motor vehicle assembly main units and systems, their function and principles of operations. The objectives of motor vehicle mechanics work at the technical college level, according to Duffy (1987) include the ability of motor vehicle craft trainees to be able to:

- Test, rebuild and replace injector nozzles
- Dismantle and re assemble a carburettor while following the procedures.
- Remove, test, repair and replace an alternator.
- Perform periodic service operation on emission control.
- Drain, flush and refill a cooling system with ant freeze.
- Dismantle, assemble, inspect and adjust manual transmission.
- Remove, select and install gasket seals and sealant correctly.
- Service a chain tensioner and timing chain assembly.

- Diagnosis common tyres, wheels and wheel balancing problems.
- Remove and replace axles, axle bearings and seals etc.

From the foregoing it can be inferred that motor vehicle mechanics trade is generally designed to equip technical college graduates with necessary theoretical and practical knowledge that will enable them secure paid employment and function effectively in industries in which they may likely be employed. Ironically, teaching and learning through which the foregoing stipulated objectives ought to be achieved has witnessed a lot of criticisms, simply because students are not learning enough. Student's performances in the school examinations as well as in national examinations such as National Business and Technical Examination Board (NABTEB) examinations taken at the end of the three years programme has continue to deteriorate. Similarly, their performances in industries in which they are employed have also been ineffective. Several factors have been identified for these poor performances. Some of these factors according to Olayanju, (2007) include, inability of our educational institution to embrace the use of ICT in teaching and learning of vocational technical education courses which motor vehicle mechanic trades is an integral part of. Aleburu, (2005)

on the other hand, lamented that the use of ICT has not been institutionalized in our schools. The new innovation of ICT in teaching and learning process in most school is still a dream yet to be realized. ICT has not been integrated into the curriculum and the main stream of instructional programmes. Another important factor here is non-availability of ICT facilities in schools. For instance, Hakhanej (1997) stressed that apart from the computer department that are equipped with few computers, available for use by their students, most other students and teachers outside the department do not have access to computer. Most of our schools are without internet facilities. The implication of this according to Wingoddg (2004) is that students and teachers will not be able to come together for lessons, tutorials and one-to-one interactions across geographic locations. The traditional world of paper is still the order of the day. Teachers and students will not be exposed to enriching teaching and learning materials on the net. Furthermore, most teachers in our schools have not been trained on the use of ICT facilities; few of them that are trained were unable to apply it adequately in teaching and learning process. As a results of these, Hakhanej, (1997) noted that Nigeria cannot achieve its objectives of vocational/technical education if teachers shy away from being computer literate and

rely heavily on the use of tradition of world of papers.

From the foregoing, it could be seen that there is need for teachers to show the tradition of world of papers, becomes computer literate and incorporate Information and Communication Technology (ICT) in teaching and learning of motor vehicle mechanic trade at technical college level.

Concept of ICT

This term is generic and could be defined in various ways, however, depending on the context. ICT derived its name from the emergence of computer technology and communication technology. Before 1950, there has been independent development of these technologies. Computer technology was aimed at better way for computing information while communication technology was aimed at finding better ways of passing information. By 1980s, there was full merger of computer technology and communication technology (ICT). Therefore, ICT can be described as the combination of items of equipment (hardware) and computer programmes (software) that that allow us to access, retrieve, store, organize, manipulate and present information by electronic means (Aleburu and Olusanya,2007). However, in the words of Ikuomola (2007)

ICTs are computing and communications facilities and features that variously support teaching, learning and range of activities in education. He further stressed that ICT as an interdisciplinary domain focuses on providing students with tools to transform their learning and to enrich their environment. The knowledge and skills and behaviour identified for this domain according to Ikuomola (2007) further enables students to:

- Develop new thinking and learning skills that produce creative and innovative insights.
- Develop more productive ways of working and solving problems individually and collaboratively.
- Create information products that demonstrate their understanding of concepts, issues, relationship and process.
- Express themselves in contemporary and socially relevant ways.
- Communicate locally and globally to solve problems to share knowledge.

Olayanju (2007) sees ICT as all kinds of electronics that are used for broadcasting, telecommunication and all forms of computer mediated communication. He further opined that advances in ICT have its full advantage in

all aspect of life. The use of computer in education has brought many on-line packages which gives students greater control over what they learn and how they learn it. It provides students with vast electronic learning capabilities. From the foregoing it can be seen that ICT is able to bring students and teachers together for lessons, tutorials and one-to -one interaction across geographic locations. In essence, with ICT, the tradition world of paper has becomes obsolete.

Teaching and Learning

Teaching is a conscious or deliberate effort on the part of a more experienced person to impact practical skills into a less experienced person. However, in the words of Santrock (2004) teaching is an attempt to help someone acquire, or change some skills, knowledge, ideas or appreciation. He further explained that one of the cardinal objective of teaching is to assist the learners develop physically, intellectually, emotionally, morally and socially in a manner that he/she will be able to exploit his/her potentials maximally. Thus teaching can influence the acquisition of desirable changes in the behaviour of learners.

Akinote (2005) sees teaching as the interaction between a teacher and student under the teacher's responsibility in order to bring out the expected change in the

learner's behaviour. The process of teaching includes schooling, teaching, training, instructing, indoctrinating, adapting and initiating ideas (Rais, 2004).

From the above analysis it can be seen that teaching is a human undertaking whose aim is to help learner to learn. It is an interaction between a teacher and a student under the teacher's guide and for teaching to be effective the teacher needs to know how the students grow, learn, think, feel and respond to outside influences in their development (Wraser, 2003).

Learning on the other hand, is a change in behaviour due to experience. It is the process by which behaviour is initiated modified or changed. It is a process by which we acquire and retain attitudes, knowledge, understanding, skills and capabilities that cannot be attributed to inherited behaviour patterns or physical growth. All these reveal that learning is a process that is used to accomplish set goals by the learner (Oguntonade, 1998). Hakah (2005) sees learning as the acquiring of habits, knowledge and attitudes involving new ways of acquiring practical skills. He further stressed that it is a changing of individual's ways of responding which comes from his thinking, perceiving emotional reaction or other psychological activity, and that skill learning is facilitated when there is explanation, demonstration and meaningful practices.

From the foregoing analysis, it can be seen that teaching and learning activities that goes on in the workshop revolve around the teacher and learner. And that the type of relationship that exists between the teacher and learner to a large extent determines whether or not learning will take place. According to Wayridge (2001) a good relationship with the learner is the most significant single element in satisfactory teaching. Apart from the personal rapport with individual learner, the general way by which the teacher interacts with the students in the workshop is another crucial factor in teaching learning process. All together, teaching is a process that facilitates learning. The teacher is the facilitator and act as a catalyst by stimulating and encouraging students to learn. And that teaching/learning process that places the learner at the centre of all activities in the workshop is known as child centred education. The learner should be an active participant in the process, as this is the only way by which learner can be free, happy, creative and well developed individuals.

Furthermore, there are two sides to any effective teaching-learning situation. There is usual theoretical side which has to do with the teaching of facts and knowledge. The second side has to do with the teaching of practical skills and attitudes. This according to Adedokun (2007)

involves muscular dexterity, and coordination of mind and muscles. He further stressed that this essentially the practical side of teaching-learning situation. For any effective teaching-learning teacher must ensure that his/her teaching practices skills, attitudes, learning and assessment of students knowledge is applied in the right mix for optimum effect of any particular objective. In other words, he/she must adopt effective teaching-learning practices.

Teaching Method

Teaching method refers to be ways and means which a teacher adopts to guide the students through learning activities in order to accomplish the desire goal. There are many teaching. These methods according to Akinseinde (1998) are meant for communicating with the students. He further lamented that effective teaching takes place when teacher knows which method to use in a particular situation to meet specific goal. And for the purpose of this paper, the following teaching methods shall be discussed:

Demonstration Method

Demonstration is an instructional method which enables students to observe procedures and techniques that illustrate specific skills, principle or concepts. Workshops and laboratories are equipped with machines, tools and materials for

developing competencies needed for particular occupation. This may involve processing construction, production, assembling, servicing and maintenance. These require the method of demonstration which is very suitable for psychomotor objectives.

Demonstration is showing and explaining how something works or how it is done or used. For example, a showing in automobile technology programme can best learn carburettor testing by watching an expert performing the task. The teaching will be effective if the teacher emphasizes correct performance, explains the processes step by step and shows the student what to do or look for while performing the task. On the other hand, the student should commit the steps to memory and recall the specific steps in sequential order before practicing with the carburettor testing machine (vacuum gauge). The demonstration should go with an explanation of what is being performed.

Project Method

A school project is a real life activity which involves investigation and problem solving with the aim of bringing out the desired learning behaviour. The teacher assigns an individual or a Isaiah group to a specific task that involves creating, doing or experimentation. It may include finding solution to a given problem

or checking a procedure. The project is often derived from the course content to reinforce abstract learning and develop skills in the use of equipment, tools and materials. As students engage in the learning process, they become actively involved with real life situation and have firsthand experience in meaningful learning. Akinseinde (1998) noted that the project method is a child centre approach. He further explained that in a group project student's work towards the same goal. They learn to plan and co-operate with one another as they work as a team. Through project method, students develop skills and improve their understanding of principles, concepts and facts.

Field Trips

Field trip is a group visit to locations for the purpose of observing on the spot situation under special guidance. The field trip provides a link between classroom apical actual life situations. It permits learners to experience that which could never occur in classroom or laboratory. Field trip helps to develop insight into the operation in industries or commercial set up. Learners have opportunity to observe, touch, hear, and where possible, actually work with employees of the visited company. This may involve handling their tools or operating modern equipment. Tours may be

made to industrial centres such as power generating station, flour mill, plastic factory, chemical company, automobile, radio and television.

Akinseinde (1998) observed that in order to make field trip a learning activity, the teacher should set up the objectives before the trip takes place. He further explained that the purpose of the visit should be made clear before the visit. Also students should be told what to expect and what to look for at the place of visit. There should have a set of questions that will be posed to workers while they expect workers to explain and answer them.

Experiment

According to Okoro (1993) experiment is a method occasionally used in Vocational and Technical courses. Experiment is useful in electricity, electronics, and power mechanics. In experiment, students are told what to do and are require to note and record their observations, Experiment assist students to learn because it enable them to verify rules, relationships and law.

The Need for ICT in Motor Vehicle Mechanics

Absence and ineffective use of electronics based system of information, reception, processing and retrieval such as computers and internet facilities in our

schools through which both teachers and students could overcome rapid changes in motor vehicle industries as results of advancement in technology is affecting the student's performance (Ihkane, 1997). It is also evident that teachers are ignorant of what is available and also how to use the technology they already have. There is also little attention in training teachers on how to exploit ICT for teaching and these of course is averting Nigeria schools from achieving substantial learning outcomes. Consequence upon this, Ikuomola (2007) identified ICT as a viable means of improving teaching and learning. This is so because of the benefits of using ICT facilities. He further stressed that ICT development is a global revolution that has become a subject of great significance and concern to all mankind.

Another great benefit of using ICT is that its emergence and its widespread integration within the schools around the world have had a deep and irreversible influence on all aspects of education. In other words, the need for ICT for improving teaching and learning of motor vehicle mechanic trades can be expressed as follows:

- ICT offers simulations where the students can experiment by changing variables.
- ICT offers a host of different tools to demonstrate learning suitable for

divergent and different intelligences.

- ICT can via multimedia improves the richness of the learning experience.
- ICT allows the teachers to focus on process rather than the products.
- ICT serves as a diagnostic tool that allows teachers to identify learning trends and problems.
- With ICT, teachers and students can interact with peers and experts outside the classroom, town, and/or country.
- Students can access quality materials irrespective of their geographic location.
- Course materials can be offered simultaneously in different language.
- It also create opportunity for both learners and teachers to have access to libraries, and data bases of other institutions of learning, research institute, government agencies to consult stored files of technical and vocational papers, studies, reports, etc

From the foregoing analysis, it is clear that teachers could adopt ICT facilities to improve the teaching and learning of motor vehicle trades at technical college level. It can further be inferred that there need for teachers and concerned

authorities to put in place necessary ICT facilities that are needed for effective teaching.

Conclusion

ICT is a very vital instrument of instruction. ICTs have become key tools and a revolutionary impact on how to see the world and we live in it. It should be noted that if the main goals of vocational technical which motor vehicle mechanic is an integral part of it is to realized, then there is need to improve the teaching and learning of motor vehicle mechanic trades through the use of ICT.

Recommendations

In order to enjoy the benefits that would be derivable from the use of ICT in teaching and learning of motor vehicle mechanic trade in our technical colleges, the following recommendations were made;

- There should be integration of ICT into both classroom and workshop lessons in all technical colleges.
- All Motor Vehicle Mechanic teachers must develop interest in the use of ICT and therefore should develop ICT skills and knowledge in order to enhance their teaching and learning process.
- All Motor Vehicle Mechanic teachers should have access to internet at home and in workshops. Government should make provision for staff development.
- Government should funds make available for ICT implementation.
- All Motor Vehicle Mechanic workshops should be equipped with adequate ICT facilities.

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