

**E-WORKSHOP INSTRUCTIONAL PACKAGE IN ENHANCING LEARNING  
OUTCOMES IN BASIC SCIENCE AND TECHNOLOGY IN JUNIOR SECONDARY  
SCHOOLS IN ILE-IFE**

**BY**

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**CERTIFICATION**

This thesis, written by EFUNWOLE, Gbenga Olaniyi (EDP09/10/H/1219) has been read, approved and adjudged to meet part of the requirements for the award of Ph.D. Degree in Educational Technology of the Obafemi Awolowo University, Ile-Ife, Osun State, Nigeria.

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## DEDICATION

This work is dedicated

to

The Glory of Almighty God, the Alpha and Omega; and

to

My uncle, Most Special Apostle Samson Ayoade FAGBULE

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## Abstract

The study developed and validated a locally-designed E-Workshop Instructional Package (EWIP) for teaching Basic Science and Technology in junior secondary schools in Ile-Ife. The study examined the effect of EWIP on students' performance in Basic Science and Technology. It also investigated the effect of the package on the performance of male and female students in Basic Science and Technology. It further compared the effectiveness of the package on students' attitude towards Basic Science and Technology when peer-led and teacher-led; and assessed the effectiveness of the package on students' retention of Basic Science and Technology concepts. These were with a view to enhancing students' learning outcomes in Basic Science and Technology in junior secondary schools in the region.

The study adopted pretest, posttest control group experimental research design. The population consisted of 4,703 Basic Science and Technology students in junior secondary schools in Ile-Ife. A sample of 96 students was selected from three schools using simple random sampling technique. The students were randomly assigned to one control (conventional method) and two experimental groups (peer-led and teacher-led). Two research instruments namely: Basic Science and Technology Achievement Test (BSTAT) and a Questionnaire on Students' Attitude towards Basic Science and Technology (QSABST) were used for data collection. The BSTAT was used to collect information on students' performance and retention of concepts in Basic Science and Technology. The QSABST was used to collect information on students' attitude towards Basic Science and Technology. The stimulus material, EWIP was used as an alternative to practical session. The package contained pictures and text materials, sessions on

woodwork practices. Topics treated were: materials used in carpentry and joinery, hand tools, joints, adhesives and abrasives. The control and the two experimental groups were exposed to the same content. The data collected were analyzed using percentage, mean, t-test and Analysis of Covariance (ANCOVA) statistics.

The EWIP was developed using validated lesson manual and multimedia scripts designed by the researcher. The EWIP contained four units of instruction, i.e materials used in carpentry and joinery; hand tools on woodwork; woodwork joints, adhesives and abrasives. It also contained motion / animated pictures for practical sessions. The instruments and the package were validated by Basic Science and Technology teachers, educational technologists and computer programmers. The results showed that the experimental groups that were taught Basic Science and Technology using EWIP performed significantly better than the control group that was taught using conventional method ( $F = 3.06, p < 0.05$ ). The results also showed that there was no significant difference in the performance of male and female students ( $t = 0.81, p > 0.05$ ). The results further showed that there was a significant improvement in the attitude of the students towards Basic Science and Technology in the two experimental groups (peer-led and teacher-led) ( $t = 3.92, p < 0.05$ ). Finally, the results showed that students that were exposed to EWIP were able to retain Basic Science and Technology concepts better than those in the control group ( $F = 8.38, p < 0.05$ ).

The study concluded that the developed EWIP could be effectively used to enhance students' learning outcomes in Basic Science and Technology in junior secondary schools.

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## CHAPTER ONE

### INTRODUCTION

#### 1.1 Background to the Study

Decades ago, the microcomputer was a rare and exotic sight in Nigerian schools. Later in the 1990s, few schools began to acquire microcomputers that were in use for secretarial and operation competence purposes. Since the beginning of the new millennium, computers use in schools became prominent for instruction, drill and practice, recordkeeping and for other applications. This led to schools and corporate establishments search for pre-service persons with competence in computer operations. With the onset of the information age, the educational use of computer will continue to grow as Kinnaman (1990) confirms. Computer can handle data in form of text, graphics, sound and video. It can also communicate with other computers, distance not being a barrier. Computers are also used in a wide variety of ways, apart from the use in schools; they are used in businesses, manufacturing, medical, home, and aviation sectors of the nation's economy (Adekomi, 1998). Important as computer is, its role in learning can only be imagined.

Learning is an important process in the understanding and development of human behaviour, and the process analyses of what takes place in man's socialization is unimaginable.

Learning starts from childhood, enabling the mind to be moulded so as to make the individual a functional member of the community (Adeyanju, 2005). Learning takes place via 'Education', and it is described as a relatively permanent change in behaviour that occurs as a result of prior experience (Okoro, 1993; Adeyanju, 2005). Functional education can be achieved through skills acquisition, which is best offered by Vocational and Technical Education (VTE) institutions. Vocational and technical education is designed to prepare skilled workers for the industries, agricultural organizations and commercial enterprises. Foundation for the knowledge and skills should be provided at the Junior Secondary School (JSS) level (Ezeji and Okorie 1998, FRN 2004). The history of skill acquisition could be traced back to the time of ancient apprenticeship system which is described as traditional practice where learning is unplanned, unstructured and solely dependent on imitation for transferring skills (Ehizogie, 2005). Ogwo (2004) opined that children were not usually trained by their parents directly; but by their relatives or friends who were master-craftsmen in specialized fields.

The process of learning is influenced by a number of factors, for which the teachers' method and techniques form a major part. Okeke and Nwachukwu (1997) and Olatoye (2006), refers to teacher's method as the organized ways the teacher employs to achieve instructional objectives. He was of the opinion that method and technique should be a dynamic and flexible force that should add spark to the teaching process. Some of the methods that have been used for the teaching of Basic Science and Technology are demonstration, projects and assignment (Uzoagba, 1996). Other methods identified by De-young (1990) are audio-visual instruction and role play. The information age has made the art and science of teaching take a new turn (Sorge, 1999). To acquire practical skills and basic scientific knowledge and attitude required of craftsmen and technicians at sub-professional level, the use of appropriate and potent teaching

method is inevitable. Equally, experience, perception and practice are germane to skill learning or acquisition (Adeyanju, 2005). Ogwo (2000) advocates for the use of modified apprenticeship technique in instructional delivery of vocational and technical subjects, because the teacher has to teach as if he/she is relearning the subject matter.

In woodwork, knowledge and skill acquisition involves practical training sessions in carpentry and joinery, machine woodworking, furniture making and upholstery works; which could be achieved electronically via instructional media (FRN, 2004). Woodwork skills are further taught in technical colleges and senior secondary schools where conventional method has been the practice. This method among others has led to poor performance and low acquisition of marketable skills of students and graduates as observed over the years.

In over fifty-three years of Nigeria's independence, it is evident that several problems beset full realization of the goals of VTE in Nigeria. These are: (i) Problem of structural imbalance and system configuration, (ii) Problem of inadequate resource input and consequent low-output; and (iii) Problem of poor societal attitude towards and acceptance of VTE as an alternative form of rewarding education (FRN, 2000). These problems have contributed to mass failure in pre-vocational and technical education subjects, particularly at the final examination of Junior Secondary Schools (JSSCE). The poor performance in Basic Science and Technology is a confirmation that achievement of self-reliance objective on vocational education is dwindling in Nigeria, and stakeholders' efforts to make her develop technologically may be futile. Between 2008 to 2012 years, about one-third of students presented for Junior Secondary School Certificate Examinations (JSSCE) in Ile-Ife passed the exercise. Such a failure rate in the

education sector, constitute a major problem (Osun State Ministry of Education, 2012) as evidenced in Table 1.1 on page 4.

If the objective of prevocational education programme have not yet been adequately achieved at the junior secondary school level, how can it be attained at senior and post secondary school levels? Table in appendix - H - revealed that the performance average ratio of technical college students that passed the National Board for Technical and Business Education

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