Proceeding of the 5th International Conference on Education for Sustainable Development

Effects of Computer Assisted Instructional Technique on Students' Achievement in Motor Vehicle Mechanic Trade at Technical College Level in Niger State

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Conceptual Framework and Background

Motor Vehicle Mechanic (MVM) is one of the trades offered at the technical college level in Nigeria. The trade is vocational in nature and it exposes students to skills. According to Nyapson (2010), MVM trade has transformed vocational education to be technological in nature. Experts had always blamed the present declining performance of students on ineffective teaching methods. It is observed that most teachers of technology education continue to engage the conventional methods of teaching, for instance, lecture and discussion methods (Raymond, 2006). According to Oranu (2003), lecture and demonstration teaching methods are regarded as conventional teaching methods which are content driven and certainly not learner-centred. Conventional teaching methods are predominantly used for instructional delivery in Nigerian schools including technical colleges. Ugo (2017) equally noted that conventional teaching methods are not challenging enough to the needs of the students. Computer-assisted instruction is learner-centred and activity oriented. Boyle and Dunleavy (2003) stated that students' achievement in learning is determined by factors such as teachers ability, motivation, interest, meaningfulness of subject matter, methods of instruction, the memory capacity of the learners and gender of the students.

The present level of academic achievement of students of MVM trade irrespective of gender calls for immediate attention. This study, therefore, finds out the effects of computer-assisted instructional technique on students' achievement in motor vehicle mechanic trade at the

technical college level in Niger State. Specifically, the study determines the: effects of Computer Assisted Instruction on students' mean achievement in Motor vehicle mechanic trade; effects of gender on students' mean achievement in Motor vehicle mechanic trade and the interaction effect of treatments (CAI and lecture method) and gender on students' achievement with respect to their mean scores in Motor vehicle mechanic trade achievement test.

Research

The study adopted pre-test, post-test, and non-equivalent control group design were adopted for the study. The study was carried out in all the seven (7) National Board for Technical Education (NBTE) accredited Technical Colleges in Niger State offering MVM Trade at National Technical Certificate (NTC) levels. The targeted population for the study was 193 TC II comprising of 162 male and 31 female MVM students in the 7 TCs in Niger State. The schools with intact classes assigned form treatment group A (Computer Assisted Instruction (CAI) were: Government Technical College, New Bussa; Government Technical College, Minna and Federal Science and Technical College, Shiroro while Mammam Kotangora Technical College, Pandogari; Government Technical College, Eyagi-Bida; Suleiman Barau Technical College, Suleja and Government Technical College, Kotangora with intact classes were assigned for treatment group B conventional (lecture) method. Three experts validated the instrument (Motor Vehicle Mechanical Achievement Test (MVMAT). The internal consistency of the instrument (MVMAT) was obtained through Kuder Richardson 21 (K-R21) statistics and the result was found to be 0.89. The achievement score obtained by the students from the two groups served as the pre-test score of the study. The actual treatment began immediately after the pre-test in treatment groups. The post-test was administered to the students in their respective group after six weeks of the treatment group. Mean and the standard deviation are used in answering the research questions while Analysis of Covariance (ANCOVA) was used in answering the null hypotheses.

Results

The inference of the effects of Computer Assisted Instruction on students' means achievement in Motor vehicle mechanic trade showed that TCII students taught Motor Vehicle Mechanic Trade with computer-assisted instruction had mean achievement score of 42.08 in the pretest and mean score of 62.23 in the posttest making a pretest, posttest mean gain in the experimental group with (CAI) to be 22.78. CAI is effective than the conventional lecture method in enhancing student's achievement in MVM trade at Technical College level.

The result on the effect of gender on the achievement scores of TC II students taught MVM with CAI and those taught with conventional lecture method showed that male students taught MVM with CAI had a pre-test mean achievement score of 45.50 and a post-test mean achievement score of 63.05 making the pretest, posttest mean gain of the male students taught with CAI to be 5.96. Similarly, female students taught motor vehicle mechanic with CAI had pretest mean achievement score of 43.56 and posttest mean achievement score of 67.34 making the pretest, posttest mean gain of the female students taught with to be 8.76. As regards the control group, male students taught motor vehicle mechanic with conventional lecture method had a pre-test mean achievement score of 44.59 and posttest mean achievement score of 53.05 making the pre-test, posttest mean gain of male students taught with the conventional method to be 1.96. Accordingly, female students taught with conventional lecture method had a pre-test mean achievement score of 43.40 and posttest mean achievement score of 63.74 making the pre-test, posttest mean gain of female students taught with the conventional method to be 2.76. The result on the interaction effect of gender and treatments on students' academic achievement showed that there is no difference in the mean achievement scores based on gender.

Recommendations

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

1. Since the use of computer-assisted instruction technique improves the academic achievement of TCII motor vehicle mechanic students at the technical college level, motor vehicle mechanic teachers should adopt the use of this technique for instructional delivery in technical colleges.
2. Seminars, workshops and conferences should be organized by the State Science and Technical School's Board where technical teachers and curriculum planners will be taught the application and usage of various modern Computer-Assisted Instruction (CAI) for effective teaching and learning of motor vehicle mechanic trade and other technical vocational courses in technical colleges.
3. Vocational-technical education teachers in the State Science and Technical School's Board should be provided with in-service training for the purpose of updating their teaching skill in the use of modern and student-centred instructional strategies and packages such as computer-assisted instruction (CAI).

Suggestions for Further Study

1. A replication of the study on other geopolitical zones of Nigeria using larger samples should be conducted.
2. Adoption of simulation instructional techniques for skill improvement needs of automobile mechanics in the Nigerian technical colleges.

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