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Impact of Hubert and Stuart model of training on interest of motor vehicle mechanic work students' on chassis and braking Systemin technical colleges

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Abstract

The study was a pre-test, post-test, non-equivalent control group quasi-experimental design. The study was to determine the effect of Hubert and Stuart model of training in suspension and steering system of Motor Vehicle Mechanic Work students'interest in Technical Colleges. Specifically, the study seeks to find out the effect of using; Hubert and Stuart model of training compared to Demonstration method on student's achievement on suspension system, steering system and student's interest on Motor Vehicle Mechanic Work Trade. The population for this study comprises of 233 respondents NTC II students of MVMW. The sample size for this study was 43 NTC students selected from the study. Instruments used for data collection were: Auto-mechanics Achievement Test (AAT) with 40 multiple questions, marking scheme answer options (A-D) and Auto-Mechanics Interest Inventory (AMII) with 30 items. Score guide sheet based on four-point rating scale used by teachers or ratter. The Cronbach Alpha Reliability Coefficient of the test instrument was used to determine the reliability coefficient of 0.81, is obtained which were indicates that the instrument was reliable for the study. The data collected was analysed in line with the research questions and hypotheses. The interest inventory was analysed using mean and standard deviation. A mean of 3.50 and above will be considered interested, below that were considered not interested. The mean gain was used to answer research questions with the used of Statistical Package for Social Sciences SPSS (Vision, 20). The effect was found to be significant, the study revealed that Hubert and Stuart model is effective in enhancing students' skill acquisition in steering system, the effect was found to be significant, it was found out that Hubert and Stuart model is effective in enhancing students' skill acquisition in suspension system, the effect was found to be significant. Therefore, the following recommendation are made: Motor vehicle mechanic work teachers should adopt Hubert and Stuart model to improve teaching and learning of auto-mechanic courses, in preparing lesson plans/note, Motor vehicle mechanic work teachers should include Hubert and Stuart model when teaching students in the class.

Introduction

Motor Vehicle Mechanic Work (MVMW) is one of the trade subjects offered at the technical college level in Nigeria whose main objective is to equip students with the necessary basic knowledge, skills and attitude to be self-reliance. The goal of Motor Vehicle Mechanic work according to the National Board for Technical Education (NBTE) (2006) is to produce skilled craftsmen with good knowledge of working principles of motor vehicles, the techniques and safety practices involved in its maintenance. Doyin (2004) stated that Motor Vehicle Mechanic Work is one of the Technical College programs which involve the acquisition of scientific knowledge in maintenance and repairing of Motor Vehicles. United States Department of Industries (2009) stated that maintenance and repairing in automobile enable students of Motor Vehicle Mechanic Work to know different types of diesel and petrol automobile maintenance, when to maintain an Automobile, how to carry out maintenance and repairing on parts of the Automobile such as: brake and chassis system.

Chassis is a French term initially used to denote the frame parts or basic structure of the vehicle, as the back bone of the vehicle.

In the view of Ede and Umar (2006) [7], chassis frame is the main supporting structure of a motor vehicle in which other components are attached, comparable to the skeleton of an organism. Chen, (2005) [5] stated that a vehicle without a body is called chassis. Some of the component parts of a vehicle are mounted on chassis including the body. Weller (2009) [22] stated that the function of chassis frame is to carry load of the passengers, goods, body of the vehicle. Therefore, the services components of the vehicle such as transmission system, axles and braking system are mounted on the chassis frame

Braking system is the mechanism in motor vehicle which is used to slow down or stop the vehicle to rest within the shortest possible distance. Kitainge, (2012) [11] stated that braking system is used to stop the vehicle while ascending or descending along the slope. Ayman (2009) [3] stated that the function of braking system is to decelerate or decrease the speed of a vehicle. Braking system is used to stop a vehicle and hold it in stationary position with or without the presence of driver (Gobet and Chassy, 2008) [9]. Therefore, braking and suspension systems work as dual-purpose system which contribute to the vehicle's handling and provide safety and comfort by keeping the vehicle's passengers comfortably isolated from bumps and vibrations.

Models can be used to facilitate learning especially where real objects may not serve the purpose. Macdonal (2009) [13] stated that model is a plan, design, and preliminary solid representation to be followed in construction, something to be copied. Nachimias and Nachimias (2002) [15] described model as a likeness of something and a representation of reality. In other words, model depicts the actual representation of the original. Model also explains how and why a particular phenomenon comes about. Ezeh (2006) [] stated that a model is simplified structuring of reality which presents supposedly significant figures or relationships in a generalized form. The author further stated that all models have basic identities in terms of characters and functions, that model are dynamic. There are several types of models that have been developed by researchers for the purpose of acquiring skill in different field of knowledge such as Havensteins model, Regsdale's model, Gildford's model and Hubert and Stuartmodel of skill acquisition.

Hubert and Stuartmodel of skill acquisition is a model that explains how students acquire skills through formal instruction and practices. Benner (1984) [4] stated that Hubert and Stuartmodel of skills acquisition is used fairly widely to provide a means of assessing and supporting progress in the development of skills and to provide a clear definition of acceptable levels for the assessment of practical skills experiences. According to Lester (2005) [12] practical experience with concrete cases can account for high levels of performance by Hubert and Stuart five-stage model of skill acquisition. The basic premise of the Hubert and Stuart model is that students' progress through five stages of expert status in this specific order: Novice, Advanced Beginner, Competent, Proficient, and Expert. Hubert and Stuart, (1986) noted that for an individual becomes expert, the individual depends less on abstract principles and more on concrete experience unlike the novice stage.

Demonstration is an act or method of showing someone how something is used or done. According to Abubakar (2013) [1], demonstration is the method of teaching learners how to perform manipulative operations. Olatoye (2008) [19] stated that an effective demonstration follows three steps of the learning cycle: stimulus step (introducing the problem), assimilative step (demonstration and development of the understanding by the learner) and application step. Okeke (2011) [18] observed that in teaching manipulative skills by the demonstration method, the teacher is concerned that the learner understands the logical step-by-step procedures in doing the job and apply the related information. In addition, Adekoya and Olatoye (2011) [2] pointed out that planning the logical step-by-step points or activities is the key to a successful demonstration. A point must be carefully demonstrated and explained to the learners by the teachers this helps to determine what will be the quality of student's interest in a particular learning environment.

Student's interest has been described as the attraction, which forces or compels a learner to respond to a particular stimulus. Interest increases learning and promoting interest in the classroom increases students' intrinsic motivation to learn (Zadina 2014) [23]. Students' interest in any learning activity is sustained by the active involvement of the learner in all aspect of the learning process. Nworgu (2004) [16] sees interest as the cause of certain actions, acting as a drive or motivation that propels people to act in certain ways either externally or internally. In other words, learner's interest in an activity increases the strength of ego-involvement of the learner and does not allow the learner to be distracted by trivial extraneous events around him/her. Obodo (2004) [17] maintained that interest controls the motivation to learn, thus, it has a direct relationship with students' achievement in any Technical College subject.

A number of factors have been found to have contributed to student's poor achievement in the technical college. The National Business and Technical Examination Board (NABTEB) May/June Chief examiner's report (2002) [14] indicated that the shortcomings of the present teaching method partly accounted for the poor performance of students inMotor Vehicle Mechanic Workin the National Technical Certificate Examination in recent years. According to NABTEB (2006) [6] the performance of students is poor. The report showed that the level of interest in auto-mechanics subjects was lower than expectation as most students scored less than 50 percent in the subject. This low interest may be due to the method of teaching adopted by auto-mechanics teachers in the Technical Colleges. Sofolahan (2001) further maintained that when demonstration method of teaching is employed, students' ability to grasp relevant concepts is made much more difficult than when students are exposed to lessons.

Statement of the Problem

The teachers of Motor Vehicle Mechanic Work in Technical College are to equip students with necessary theoretical knowledge and practical skills that will enable the graduates of Motor Vehicle Mechanic Work to set up their own workshops, self-employed and even employ others. Motor Vehicle Mechanic work exposes students to various skills in motor vehicle maintenance and repairing. Most of the new automobile vehicles are now built with automobile sophisticated breaking technologies and competitive industrial/electronic, changings and development in chassis, and braking system which these Motor Vehicle Mechanics Work graduates need to be familiar with before graduation.

Motor Vehicle Mechanic Work graduate's unemployment has reached alarming proportions as a result of low skills they acquired while in Colleges. Those students who eventually

study Motor Vehicle Mechanic work in the Technical Colleges do not perform well in the National Business and Technical Examination Board (NABTEB) examination. The National Business and Technical Examination Board (NABTEB) May/June Chief examiners" report (2012) indicated that the shortcomings of teaching method partly accounted for the poor performance of students in Motor Vehicle Mechanic Work in the National Technical Certificate Examination in recent years. According to NABTEB (2012), the performance of students in National Technical Certificate (NTC) Examination was poor.

However, motor vehicle mechanic graduates find it difficult to maintain and repair modern automobile vehicles competently due to new electronics technology such as computer systems and microprocessors in form of electromechanical systems in automobile vehicles. These is due to techniques adopted in the process of skill acquisition. Therefore, it became necessary to determine the effect of using effect of Hubert and Stuart model of Training in chassis and braking System of Motor Vehicle Mechanic Work Students' Interest in Technical Colleges Nigeria.

Purpose of the Study
The major purpose of this study is to determine the effect of Hubert and Stuart model of Training in chassis and braking System of Motor Vehicle Mechanic Work Students' Interest in Technical Colleges Nigeria. Specifically, the study seeks to find out the effect of using;
1. Hubert and Stuart model of training compared to Demonstration method on student's interest on chassis system.
2. Hubert and Stuart model of training compared to Demonstration method on student's interest on braking system.

3. Hubert and Stuart model of training compared to Demonstration method on student's interest on Motor Vehicle Mechanic Work Trade.

Methodology
The study was a pre-test, post-test, non-equivalent control group quasi-experimental design. The population for this study comprises of 233 respondents NTC II students of MVMW. The sample size for this study was 43 NTC students selected from the study. Instruments used for data collection were: Auto-mechanics Achievement Test (AAT) with 40 multiple questions, marking scheme answer options (A-D) and Auto-Mechanics Interest Inventory (AMII) with 30 items. Score guide sheet based on four-point rating scale used by teachers or ratters. The Cronbach Alpha Reliability Coefficient of the test instrument was used to determine the reliability coefficient of 0.81, is obtained which will indicates that the instrument was reliable for the study. The data collected was analysed in line with the research questions and hypotheses. The interest inventory will be analysed using mean and standard deviation. A mean of 3.50 and above will be considered interested, below that will be considered not interested. the mean gain will be used to answer research questions one and two, while Analysis of covariance (ANCOVA) will be used to test the null hypotheses at 0.05 level of significance with the use of Statistical Package for Social Sciences SPSS (Vision, 20).

Presentation of Data and Analysis
Research Question 1
What is the effect of Hubert and Stuart model of training and Demonstration method on student's achievement on suspension system?

Table 1: Mean and standard deviation of pre-test and post-test scores of the experimental and control groups insuspension system.

Treatment group	N	Pre-test mean	SD$_1$	Post-test mean	SD$_2$	Mean Gain
Hubert and Stuart model	23	21.34	4.52	78.95	8.41	57.60
Demonstration method	20	19.05	5.38	65.45	4.01	46.40

The data present in Table 1 shows that students taught with Hubert and Stuart model had a Mean score of 21.34 and Standard Deviation of 4.52 in the pre-test and Mean score of 78.95 and Standard Deviation of 8.41 in the post-test making a pre-test and post-test Mean gain of 57.60 respectively. The students taught with Demonstration method had a Mean score of 19.05 and Standard Deviation of 5.38 in the pre-test and mean score of 65.45 and Standard Deviation of 4.01 in the post-test making a pre-test and post-test Mean gain of 46.40 respectively. With these results, both Hubert and Stuart

model and Demonstration method are effective in improving student's achievement test in chassis system but the effect of Hubert and Stuart model in improving student's achievement test in suspension system is higher than the Demonstration method.

Research Question 2
What is the effect of using Dreyfusand Dreyfus model of training and Demonstration method on student's achievement on steering system?

Table 2: Mean and standard deviation of pre-test and post-test scores of the experimental and control groups insteering system.

Treatment group	N	Pre-test mean	SD$_1$	Post-test mean	SD$_2$	Mean Gain
Dreyfus model	23	22.82	4.18	81.43	6.82	58.60
Demonstration method	20	22.82	4.72	64.25	3.76	41.42

The data present in Table 2 shows that students taught with Dreyfus and Dreyfus model had a Mean score of 22.82 and Standard Deviation 4.18 in the pre-test and Mean score of 81.43 and Standard Deviation of 6.82 in the post-test making a pre-test and post-test Mean gain of 58.60 respectively. The

students taught with Demonstration method had a Mean score of 22.82 and Standard Deviation of 4.72 in the pre-test and mean score of 64.25 and Standard Deviation of 3.76in the post-test making a pre-test and post-test Mean gain of 41.42 respectively. With these results, both Dreyfus and Dreyfus

model and Demonstration method are effective in improving student's achievement test in steering system but the effect of Dreyfus model in improving student's achievement test in steering system is higher than the Demonstration method.

Table 3: Mean and Standard Deviation of Pre-test and Post-test scores of the Experimental and Control Groups in Student's Interest in Motor Vehicle Mechanic Work.

Treatment group	N	Pre-test mean	SD_1	Post-test mean	SD_2	Mean Gain
Dreyfus model	23	22.44	2.10	79.94	4.32	57.50
Demonstration method	20	21.35	3.15	64.20	1.59	43.84

The data present in Table 3 shows that students taught with Dreyfusand Dreyfus model had a Mean score of 22.44 and Standard Deviation 2.10 in the pre-test and Mean score of 79.94 and Standard Deviation of 4.32 in the post-test making a pre-test and post-test Mean gain of 57.50 respectively. The students taught with Demonstration method had a Mean score of 21.35 and Standard Deviation of 3.15 in the pre-test and mean score of 64.20 and Standard Deviation of 1.59 in the post-test making a pre-test and post-test Mean gain of 43.84 respectively. With these results, both Demonstration method and Dreyfus and Dreyfus model are effective in enhancing students' skill acquisition in student's interest on Motor Vehicle Mechanic Work Trade, but the effect of Dreyfus and Dreyfus model in improving students in interest on Motor Vehicle Mechanic Work Trade is higher than Demonstration method.

Conclusion
Based on the results of this study, which shows that Dreyfus and Dreyfus model is more effective in improving students 'interest in Motor Vehicle Mechanic Work, there was an effect attributable to students'interest in Motor Vehicle Mechanic Work. Dreyfus and Dreyfus model is employed to teach Motor Vehicle Mechanic Work in Technical Colleges. These results, therefore, show that Dreyfus and Dreyfus model is a viable teaching method for teaching/learning Motor Vehicle Mechanic Work in Technical Colleges.

Instruction based on Dreyfusand Dreyfus model is a contemporary teaching approach which maximizes students' learning potentials by minimizing the problems caused by the students' individual differences and creating a learning environment appropriate for each student's intelligences. The Dreyfus and Dreyfus model will give teachers the opportunity to engage the students in the learning process, which will increase their self-esteem and enthusiasm and their willingness to take ownership and responsibility for their learning. Thus, if Dreyfusand Dreyfus model is adopted to teach service station in Technical Colleges, the Motor Vehicle Mechanic Work craftsmen will, undoubtedly, be equipped with knowledge and skills that will help them to easily adapt and apply their skills in Motor Vehicle Mechanic Work as well as perform and cope more effectively with complexities in the vast changing automobile world of work.

Recommendations
Based on the findings of the study, the following recommendations are made:
1. Workshops, seminars and conferences should be organized by State Science and Technical Schools Board to enlighten and train Motor Vehicle Mechanic Work teachers on the of Dreyfus and Dreyfus model for improving students' skills acquisition, achievement and interest in studying Motor Vehicle Mechanic Work.

Research Question 3
What is the student's interest in Dreyfusand Dreyfus model and Demonstration method of teaching Motor Vehicle Mechanic Work Trade?

2. National Board for Technical Education (NBTE) should consider the review of curriculum for Motor Vehicle Mechanic Work with a view to incorporating activities that reflect Dreyfus model to enable students learns more effectively.
3. Motor Vehicle Mechanic Work teachers in Technical Colleges should adopt Dreyfus and Dreyfus model in their classroom teaching. This will help the teachers equip Motor Vehicle Mechanic Work craftsmen with the knowledge and skills needed to easily cope and perform more effectively in the automobile world of work.

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