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Effect of Selected Instructional Methods on Students' Technical Skills Acquisition in Mechanical Engineering Craft Practice Trade in Government Technical Colleges in Kano State

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Abstract

This study determined the effects of Selected Instructional Methods on Students Technical skills Acquisition in Mechanical Engineering Craft Practice Trade in Government Technical Colleges in Kano State, Nigeria. It was guided by a purpose with corresponding 1 research questions and a null hypothesis tested at 0.05 level of alpha. The study was hinged on Dreyfus Skill acquisition theory. Literature and related empirical studies were reviewed according to the purposes of the study. The study adopted Quasi- experimental research design (non-equivalent pre-test, post-test, control group design). The population of the study was 102 NTC II MECPT students. Purposive sampling technique was used to determine the sample size. The subjects were separated into three groups; the experimental group I (N= 40), experimental group II (N = 28) and the control group (N=34). The instrument for data collection was titled Mechanical Engineering Craft Practice Achievement Test (MECAT). The data collected were analyzed using SPSS, mean and standard deviation were used for answering the research questions while hypotheses were tested using Analysis of Covariates (ANCOVA) at 0.05 alpha level. The findings showed that; Hands-on learning instructional method yielded better result and improves MECPT students' performance higher than Lecture teaching method. The result from the hypotheses analysis revealed that. there was significant difference in the performance of students taught Mechanical Engineering Craft Practice Trade using Mastery learning instructional method, Hands-on Learning instructional method and Lecture teaching methods F, (df=2, 102) = 113.202, p = 0.00; Based on the findings, it was Recommend that, Technical vocational teachers should be encouraged to use hands-on and Mastery learning instructional methods for improved teaching in Technical Colleges in Kano state

Keywords: Mastery Learning, Hands-on Learning, Technical Skill, Skill

Introduction

Technical Colleges in Nigeria are established to train craftsmen, as skilled workers, that should support industrial operations in area of maintenance, production of goods and general services. In other words, one of the major goals of technical colleges is to produce

efficient craftsmen at sub-professional level, that will promote industrial development (Abdulkadir, 2011). Further, Goyol and Sunday (2020) stated that, students in technical colleges, are trained in trade courses such as auto-mechanics, woodwork, plumbing, electrical installation and maintenance, computer craft practice, building, mechanical and several other trade courses as approved by the National Board for Technical Education (NBTE). Mechanical engineering craft practice is the focus of this study. It is one of the trades found in technical colleges which aim at training students on the general properties and uses of metals in order to help them select appropriate materials for particular job; train them on how to differentiate the techniques and approaches for a specific work and teach them on how to utilize the safety rules and regulations in the mechanical engineering craft practice workshops (Amaechi, Orlu, Obed & Thomas, 2017).

The practical aspect of Mechanical Engineering Craft Practice according to National Board for Technical Education (NBTE, 2003), involves metal machining and fitting operations. The machining operations include turning, milling, knurling, drilling, boring and grinding; while fitting aspect involves preparing mating parts to touch or join each other in such a way that one will turn inside another or slide upon another or the parts will hold tightly together so that they cannot move upon each other. In the same vein, Adamu, Dawha and Kamar (2015) stated that, metal fitting is an activity necessary to make metal parts fit to each other. It involves practical skills operations in measurement, marking-out, clamping, cutting, scrapping and lapping, filing and finishing, drillings, grinding, assembling etc. to repair, maintain or produce mechanical components.

Skills is referred as special abilities in a given occupation acquired through learning and practice and it is a level of efficiency achieved or attained through repetitive performance of an operation and that skill is the capability of accomplishing a job with precision, cleverness and expertise. (Samuel, 2017) These authors believe that technical skills are a kind of expertise or technical competence related to the field of the workers. Further, they view technical skills as 'hard skills' which is associated with the efficient use of tools and equipment related to a particular work. Contributing, Diraso, *et al* (2019) defined technical skills as job-specific related skills required to perform a particular job, which involve, specialized knowledge, analytical ability within a specialty and faculty in the use of tools and techniques of the specific discipline. The training that will lead to acquisition of Technical skills in Mechanical Engineering Craft Practice Trade require adequate funding; effective and efficient teaching methods; utilization of improved and standard instructional equipment; relevant curriculum and good quality of teachers (Dasmani, 2011) Writing on instructional strategies, Tumba and Shuaibu (2016) opined that Instructional strategies determine the approach a teacher may take to achieve learning objectives. And so, they defined teaching techniques as teacher's activities in the class to involve students in the subject matter, and requires that students participate in learning activities, share equally with other learners, and react to the learning experience. Instructional techniques /methods are specific acts adopted by veteran teachers to inject variety into their teaching, stimulate it and maintain the learner's interest on the subject (Ochogba , 2019). Although there is no one best method of teaching practical skills

instructions in technical colleges, but a method or combination of different methods may be more desirable to use. There are already known strategies of teaching that can be adopted to facilitate the acquisition of practical skills in technical and vocational education programs in Nigeria. This, according to the recommendation by Community Training and Assistance Center & Washoe County School District (2015). Includes demonstration method, Discussion method, Project method, Discovery method, Lecture method, Field-trip method, Assignment method, Electronic teaching method, Enquiry method. Problem solving method. Mastery Learning and Hands-on Learning method etc. The technical teacher may select among these methods to teaching practical skills in technical colleges.

Mastery learning strategy was developed by Benjamin Bloom, (1968). Mastery learning applies the principles of individualized instruction and tutoring whole class model. In this model, rather than waiting to the end of a unit to check on progress, teachers design ongoing checks to use during the process to provide individual feedback, diagnose learning needs/difficulties, prescribe specific remediation or enrichment strategies, and re-assess with a parallel assessment. Mastery learning honors the idea that students learn at different levels or paces. The strategy allows students to study materials unit for them to master. Mastery of each unit is shown when the students acquire the set pass mark of a diagnostic test.

Contributing, Ekwuemi,Ekon and Ezenwa-Nebife, (2015) agreed that Hands-on learning is an educational strategy that directly involves learners to do something in order to learn about it. It is learning by doing. Hands-on-approach is a method of instruction where students are guided to gain knowledge by experience. This means giving the students the opportunity to manipulate the objects they are studying.

The conventional or traditional method of teaching in Technical colleges in Kano state is Lecture method. The only exchange that may occur between the instructor and student might be a few scattered questions from the listeners (Mele,2018).This method of teaching, according to these authors, is teacher centered and may not sufficiently give students opportunity to participate in the classroom activities which in turn lead to poor performance in skill acquisition; poor performance in certificate examination which may hinder the students from securing a job in industries; inability to be self-employed and or prevent them from gaining admission in to higher technical institutions. Valls and Ponce (2013) affirmed that effective learning hardly occurs with teacher-centered teaching methods and this calls for the exploration of the use of effective teaching strategies like Hands-on learning and Mastery learning teaching methods of instructions which teachers, in technical colleges, perhaps are not aware of and may not have been employing them to teach. It is on this premise that the study intends to determine the effect of selected instructional methods (Mastery and Hands-on Learning Instructional methods) on students' acquisition of technical skills in Mechanical Engineering Craft Practice in Technical Colleges in Kano State. The study was delimited to determining the effect of

instructional methods on students' acquisition of technical skills in Mechanical Engineering Craft Trade in Government Technical Colleges in Kano State.

The study used Hands-on learning strategy, Mastery learning strategy as the experimental approaches and Lecture teaching method as control method. The study covered three accredited technical colleges in Kano State namely, Government Technical College Bagauda, Government Technical College Kano and Government Technical College Tiga. The study covers the following specific areas in MET; Measurement and marking out, metal cutting, introduction to Gas and Arc welding, and drilling operations.

The result of this study would be of significant benefit to Technical and Vocational Education Teachers, National Board for Technical Education (NBTE) Educational planners, Ministry of Education of Kano state, Science and Technical Schools Board of Kano State, and Individual researchers, and Students. The result of the study will provide teachers with most appropriate information on instructional method to use for effective teaching of particular practical skills and thus improve teacher's effectiveness and thus enhance student's acquisition of technical skills that are necessary for employment in industries and self-employment. Also the result of the study when published will enable the technical and vocational teachers to understand their roles better and enhance their effectiveness in teaching technical skills to students.

The Science and Technical Boards, National Board for Technical Education (NBTE), administrators and stake holders of TVET would use the finding of the study to sensitize, provide adequate and relevant instructional equipment and be useful in reviewing the curriculum content of METs program by emphasizing basic areas of technical skills in Mechanical Engineering Trades,

The study would be beneficial to future technical college graduates as their teachers would use the knowledge from this study to help them acquire requisite technical skills. It will also be beneficial to research bodies in educational sectors and individual researchers. Also, It will add to the existing knowledge of technical skills of mechanical engineering craft practice trade and thus serve as resource material to future researchers and scholars when published in reputable journals and through conferences.

Statement of the Problem

There is a general concern over the low performance of Technical College graduates, most especially those of Mechanical Engineering Craft Practice who cannot cope with the demand of the world of work expected of technical college graduates. They are expected, after graduation, to either secure employment in the industries, pursue further education in advance craft in a higher technical institutions and or be self-employed (NBTE, 2003 and FGN, 2013). Previous research outcomes have shown that, the present industries are not really satisfied with the quality of Mechanical Engineering Craft Practice Trade fresh graduates in terms of displaying of technical skills and that, the graduates lack the technical competencies of being self-employed (Olorunfemi and Ashaolu, 2008).

In the same vein Audu (2014) reported that, the employers of labor find it difficult to employ graduates of technical colleges, even when they employ them, the employers have to retrain them for months so as to equip the graduates with the required skills, Further, Personal observations of the current researchers corroborates reports from Literature concerning worry of industries about skills possessed by graduates of MECPT. This situation is unfortunate. And so, to prevent negative turn over effect on the economic development of individuals and the nation, this ugly situation should not be left unattended to. The lack of acquisition of appropriate technical skills by graduates of technical colleges may be attributed to the in ability of the teachers to select the best Instructional methods to impart technical skills. Hence this study sought to determine the effect of selected instructional methods (Mastery and Hands-on Learning Instructional methods) on students' acquisition of technical skills in mechanical engineering craft practice trade in technical colleges in Kano state.

Objectives of the Study

The main purpose of this study was to determine the Effect of some Selected Instructional methods on students' technical skill acquisition in Mechanical Engineering Craft Practice Trade in Technical Colleges in Kano State. Specifically, this study;

Determined the most effective among Mastery Learning Instructional method, Hands-on Learning Instructional method and Lecture method of teaching on students' technical skills acquisition in Mechanical Engineering Craft Practice trade (MECPT) in Government Technical Colleges in Kano State.

Research Question

The study was guided by the following research question;

What is the mean difference in performance of Mechanical Engineering Craft Practice trade (MECPT) Students when taught using Mastery Learning Instructional method, Hands-on Learning Instructional method and Lecture method of teaching on students' technical skills acquisition in Government Technical Colleges in Kano State?

Hypothesis

The following null hypothesis was formulated and tested at 0.05 level of significance.

H_{01}. There is no significant difference in the mean performance of mechanical engineering craft practice trade students' when taught using Mastery learning instructional method, Hands-on learning instructional method, and Lecture method of teaching technical skill acquisition in Government Technical Colleges in Kano State.

Methodology

The study adopted quasi-experimental design which involved pretest and post-test of non -equivalent control group. Sambo (2005) defined quasi-experiment as a design which involved assignment, but not random assignment of participants to groups, in other words, entire classrooms, not individual students, are assigned to treatments and this design assumes that the treatment and control groups are similar in terms of their characteristics The design fit in to the study because school authorities will not allow a researcher to disrupt their normal school setting for the purpose of creating true experiment group hence the school intact class are used. The two groups (made up of three technical colleges) experimental and control groups were randomly assigned to the methods of teaching, Intact classes were also randomly assigned to different treatment conditions. This research design for the study is represented as follows:

O_1 X_1 O_2 O_3

O_4 X_2 O_5 O_6

O_7 X_3 O_8 O_9

Where X_1, and X_2 are respectively the instructional strategies of Mastery Learning and Hands-on Learning, while X_3 is the Lecture Method of teaching. O_1, O_4 and O_7 are the observed performance scores in Pre-Test for the instructional groups X_1, X_2 and X_3 respectively. Similarly, O_2, O_5 and O_8 are the Post Test scores observed for the instructional treatments given to X_1, X_2 and X_3 respectively. Finally, O_3, O_6 and O_9 represent the Test scores observed in respect of the instructional treatments X_1, X_2 and X_3 given to the students exposed to Hands-on learning Strategy (X_1); Mastery learning Strategy (X_2) and Conventional Method (X_3).

This research design has four key steps/stages listed below

1. Pretest: Before the intervention or treatment is administered, both the treatment and control groups are assessed on a pretest measure. This serves as the baseline measurement of the dependent variable(s) of interest.

2. Treatment: The intervention or treatment is administered to the treatment group. The control group does not receive the intervention and serves as a comparison group.

3. Posttest: After the intervention or treatment is completed, both the treatment and control groups are assessed on the same dependent variable(s) as in the pretest. This allows researchers to measure the changes that have occurred as a result of the intervention.

4. Analysis: Statistical analysis is conducted to compare the pretest and posttest scores between the treatment and control groups. The goal is to determine if there have been significant changes in the dependent variable(s) in the treatment group compared to the control group. However, due to the lack of random assignment, it is important to interpret the results with caution.The independent variable in the study is the instructional treatment, Xn. The dependent variable is the students' Acquisition of technical skills in Mechanical Engineering Craft Practice Trade.

The study was carried out in Kano State, Nigeria. Geographically, Kano state is located between the Latitude 11^0 59' 47"N and Longitudes 8^o 31' 0" E of the Greenwich Meridian (World Atlas Map, 2015). Kano State borders Katsina state to the north-west, Jigawa state to the north-east, Bauchi State to the south-east and Kaduna State to the south-west. Kano state have industries that is related to the field of study, where technical graduate is needed for services of machine, agricultural implement and related tools and equipment.

The target population of the study was 102 students of NTC II in all the three (3) accredited Government Technical Colleges in Kano State that are offering Mechanical Engineering Craft Practice Trade. The students that served as subjects have the same characteristics in terms of gender, educational lebvel and geographical region. The colleges included Government technical college Kano, Government technical college Bagauda, and Government technical college Tiga. Purposive sampling technique was used in selecting the schools for the study. Three accredited technical colleges that are offering Mechanical Engineering Craft Practice Trade were selected. The control of Experimental groups for the study was selected through Simple Random Sampling by the use of balloting. For the subjects, census sampling technique was adopted where the whole population of 102 NTC II students were used because it is manageable. NTC II students was used for this study because there is no external examination in their level that could have interfered with their normal concentration in the class and they not new in the field of study because have already completed NTC I and currently at NTC II.

The instrument for the study was a multiple choice test item tagged"Mechanical Engineering Craft Achievement Test" (MECAT). It consisted of four sections, A B, C, and D. Each section contains 25 items, which add up to One Hundred (100) objective questions. They were adopted from NABTEB past questions. Sections A, B, C and D asked questions on measuring and marking out; metal cutting; Introduction to gas and arc welding process; and drilling process respectively. The study used hands-on lesson planning; Mastery lesson planning and lecture teaching method lesson planning in teaching the students measuring and marking out; metal cutting; introduction to Gas and Arc welding and drilling process. The above-mentioned themes were drawn out from NBTE Mechanical engineering craft syllabus and NATEB past Question Papers and some adopted from Kama and Dabo, (2019). This choice is supported by U.S. Department of Labor Employment and Training Administration (2000). Who stated that Achievement

Test measure how well students can demonstrate their knowledge of a particular academic subject or skill and are frequently used to measure an individual's current knowledge or skills that are important to a particular job.

The instrument (Mechanical Engineering Craft Achievement Test, MECAT) was validated by three experts, one from Technology Education Department of Modibbo Adama University Yola and one from Kano state college of Education Kumbotso and the other from Kano state Polytechnic. The validates were requested to assess the adequacy of the content, logical sequence and suitability of the technical terms used. All suggestions, observations and recommendations from the Validates' were used to produce the final copy of the instrument.

The researchers adopted NABTEB past questions which was considered to be a standardized instrument. However, to ensure the reliability of the instrument, test-retest procedure was employed and reliability coefficient of 0.82 was obtained using product moment correlation coefficient. Therefore the instrument was considered reliable and so it was used to test the students' performance in Mechanical Engineering Craft Practice Trade in Government Technical Colleges in Kano state.

The Pre-test was administered on both experimental group and control group to obtain the scores. At the end of the treatment, post-test was administered on both experimental group and control group again with the same instruments but differently arranged to obtain the scores with the help of one research assistant assigned by the principals of the schools visited on different occasions under the supervision of the researcher

The data was collected through the following procedure.

The researcher observed the following procedures in carrying out the treatment and collection of data.

Step 1; The researcher presented an introduction letter from the Department of Technology Education of Modibbo Adama University, Yola to the principals of the selected schools through Science and Technical School Board for permission to carry out the research work

Step 2: Training of Research assistants on how to teach student mechanical engineering craft using Mastery learning, Hands-on learning instructional methods for experimental groups and Lecture method for control group.

Step 3: The researcher conducted pre-test for both experimental and control group to check their entry equivalence

Step 4: Conduct of the actual experiment- the research assistants under the supervision of the researcher delivered the lessons for four weeks teaching session involving the three different teaching methods (hands-on, mastery and lecture methods) This teaching was

guided by three different lesson plans (group1 mastery group2 hands-on and control group3 lecture methods)

Step 5: The post-test Administered with the help of research assistants who conducted post-test to both experimental and control groups. The experiment lasted six weeks. The first week was utilized for general orientation of research assistants and conduct of pre-test to both experimental and control groups. The second to fifth weeks were used in teaching the students content of the focus of study-where the students were taught measuring and marking out; in second week, metal cutting; in the third week, Introduction to Gas and Arc welding; in the fourth week and Drilling process; in the fifth week, and the sixth week was devoted to the conduct of post-test.

Step 6 To Justify data collected for analyses, at the end of the treatment, a post-test was administered to both experimental and control groups, duration of the post-test was 2hrs and the results obtained were recorded.

The data collected was analyzed using descriptive statistics and analysis of covariate. Mean and standard deviation were used to answer the research questions. Any group with higher mean in the achievement test, irrespective of the closeness in the mean value, was taken to have performed better and the method used in teaching them was equally considered better. while ANCOVA was used to test the hypotheses at 0.05 level of significance with the help of Statistical Package for Social Sciences (SPSS) Version 23.

Decision rule for testing the hypotheses was that, if calculated P value was less than or equal to table value, the null hypothesis was rejected, which means that there is a significant difference while if calculated P value is greater than the table value, the null hypothesis would be accepted, meaning that there is no significant difference.

Control of Extraneous Variables

Extraneous variables as described by Oviawe (2010) are those variables that are not included in the study but whose significant influence may invalidate results. They are not variables of primary interest in the study but must have to be controlled. Therefore, the control of the extraneous variables in this study was achieved through the following procedures:

Teacher variability

In order to reduce the effect of teacher variable on the students' performance, the researcher visited the schools, selected teachers that have qualification and teaching experience in common and sufficiently briefed them, together, on mastery and hands-on learning instructional methods. The researcher also ensured that the students involved are taught by the regular selected teachers throughout the period of experiment.

Instructional Situation Variability

For uniformity of instructional situation, the different tutors were provided with the relevant instructional materials such as detailed lesson plans prepared by the researcher and validated by experts. There were four different lesson plans for each of the method as the teaching lasted for four weeks.

Hawthorne Effect:

Hawthorne effect as defined by Kompier (2006) is a situation where the performance of research subject is affected due to the fact that the students are conscious of the fact that they are involved in an experiment. In order to reduce this problem, the researchers used the normal classroom teachers in both control and experimental groups. Also, they assigned each school to a single treatment (control or experimental).

Effect of Pre-test – Post-test

There was four weeks interval between the pre-test and the post-test and the items in pre-test and post-test were arranged in different order, it was reshuffled to take care of the possibility of the students becoming test-wise.

Results

Research Question one

What is the mean difference in performance of Mechanical Engineering Craft Practice trade (MECPT) Students when taught using Mastery Learning Instructional method, Hands-on Learning Instructional method and Lecture method of teaching on students' technical skills acquisition in Government Technical Colleges in Kano State?

Table 1: Mean and Standard Deviation Skills acquisition performance Scores of MECPT student's when taught using Mastery Learning Instructional method, Hands-on Learning Instructional method and Lecture teaching method

Teaching Methods		Pre test		Post Test	
	N	($\bar{X}$)	S.D	($\bar{X}$)	S.D
Mastery Learning	28	30.79	8.08	48.32	8.56
Hands-on Learning	40	33.60	9.87	59.15	7.16
Lecture Method	34	26.88	9.36	30.00	8.88

The result presented in table 1: reveals the mean score differences of MECPT students taught using Mastery Learning instruction method, Hand-on Learning instruction method and Lecture teaching method. Mastery Learning instruction method with a post-test mean score of 48.32, Hand-on Learning instruction method with a post-test mean score of 59.15

Then, Lecture Instructional method had post-test mean of 30.00. The result favors Hand-on learning instruction method against Mastery Learning instruction method and Lecture teaching method. This indicate that, Hand-on Learning instruction method is the most effective instructional method in acquisition of technical skills than Mastery Learning instruction method and lecture teaching method.

Hypothesis testing H_{01}.

There is no significant difference in the mean academic achievement of students taught mechanical engineering craft practice trade using Mastery learning, Hands-on learning and those taught using Lecture method of teachings in Government Technical colleges in Kano State.

Table 2: One- way Analysis of Covariate among mastery learning instructional method, Hands-on Instructional Method and Lecture teaching method on MCPT students' technical skill acquisition performance

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	16244.008[a]	6	2707.335	42.251	.000
Intercept	17370.509	1	17370.509	271.087	.000
Pre-test	.775	1	.775	.012	.913
Teaching Methods	14507.324	2	7253.662	113.202	.000
Error	6087.335	95	64.077		
Total	242509.000	102			
Corrected Total	22331.343	101			

R Squared = .727; Adjusted R Squared = .710

The result in table 2 presented the one-way Analysis of Covariate among mastery learning instructional method, Hands-on Instructional Method and Lecture teaching method of MECPT performance in technical skill acquisition. The F, (2, 113.202) = 113.202, p-value = 0.00 tested at 0.05 level of significant. Since, the computed probability value is less than the level of significance at 0.05, hence, the null hypothesis is rejected indicating that there is significant difference among the instructional methods in teaching technical skills.

Table 3: Post Hoc Analysis among Hands-on, mastery learning and Lecture Instructional Method on MCPT students' Achievement

(I) Teaching Methods	**(J) Teaching Methods**	**Mean Difference (I-J)**	**Std. Error**	**Sig.[b]**	**95% Confidence Interval for Difference[b]** Lower Bound	Upper Bound
Hand-on Learning	Mastery Learning	10.052*	2.078	.000	4.988	15.116
	Lecture Method	29.407*	1.970	.000	24.607	34.207
Mastery Learning	Hand-on Learning	-10.052*	2.078	.000	-15.116	-4.988
	Lecture Method	19.355*	2.151	.000	14.114	24.596
Lecture Method	Hand-on Learning	-29.407*	1.970	.000	-34.207	-24.607

	Mastery Learning	-19.355*	2.151	.000	-24.596	-14.114

Key:*. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons:

Table 3: shows the results of Post Hoc Analysis among mastery learning instructional method, Hands-on Instructional Method and Lecture teaching method on MECPT students' performance. The result indicates that Hands-on learning when compared with Mastery learning produced a mean difference of 10.052* with a p-value of 0.000, indicating that there is no significant difference in favor of Hands-on learning against Mastery learning. When Hands-on learning.is compared with Lecture teaching method the mean difference of 29.407* was obtained with a p-value of .000 indicating there is a significant difference between Hands-on learning and Lecture teaching method. However, when mastery learning was compared with Hands-on learning, a mean difference of 10.052* was obtained with a p-value 0.00, indicating that there is no significant difference between mastery learning and Hands-on learning in favor of mastery learning against Hands-on learning. The result from this table revealed that Hands-on Learning Instructional method yielded a difference of 29.407* between Mastery and Lecture Instructional methods of teaching, therefore from this research reports it indicates that, Hands-on Learning Instructional method is better amongst the instructional method used in the conduct of the study.

Findings of the study

The following findings were revealed that:

1. Hands-on Learning instructional method is the most effective instructional method in acquisition of technical skills than Mastery Learning instruction method and lecture teaching method when employed in teaching technical skill acquisition in technical colleges in Kano State.

1. There was significant difference in the mean academic achievement of MECPT students when taught skills acquisition, using the three teaching methods, in favor of hands-on learning, in technical colleges in Kano State.

Discussion

The finding in research question 1 indicated that, Hand-on Learning instruction method improves MECPT students' acquisition of technical skills than mastery and lecture teaching methods in teaching technical skills acquisition Finding from the corresponding hypothesis showed that there was a significant difference among the performance of MECPT students taught using Hands-on learning in technical colleges in Kano State. The Finding of this study is in consonance with the findings of Josiah and Victor. (2012) who reported that, students taught using hands-on activities had higher skills acquisition in physical chemistry than their discussion group counterparts; and that Hands-on activity

significantly enhanced both male and female students' skills acquisition in physical chemistry. However, this result contradicts the finding of Aneke (2015) who reported that, Agricultural science Teachers used demonstration, action research method, individual teaching method, field experience (farm) teaching, field trip methods of teaching, etc. and that, to a great extent, enhanced skills acquisition for self-reliance in Enugu State than hands-on learning teaching method.

Conclusion

Based on the findings of the study it was concluded that, the research is successful, because the researcher got what they set-out find. Explicitly, the researchers conclude that, Hands-on Learning Instructional Method is more Effective than the other methods since there is a significant difference among the performance of MECPT students taught using Mastery learning, Hands-on learning, and Lecture Teaching Methods based on school location in technical colleges in Kano State.

Contribution to Knowledge

To the knowledge of the researchers, until now, there was no knowledge on how effective hands-on learning is on skill acquisition of MECPT students in technical colleges in Kano State. This finding has opened the eyes of educators. This knowledge, which was not known before now, is a significant contribution to the body of knowledge on the subject matter of this study. Future researchers will find this finding a useful stepping stone

Recommendations

Based on the finding of this study the following recommendations were made:

1. The federal and state governments should organize Regular workshops, seminars and conferences for Technical vocational teachers to upgrade their teaching strategies on hands-on and Mastery learning instructional methods in Technical Colleges in Kano state.

2. National Board for Technical Education (NBTE) should consider review of curriculum for National Technical Certificate in order to incorporate Hands-on instructional method as instructional media for teaching Vocational and technical subjects in Technical colleges.

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