

EFFECT OF MASTERY LEARNING METHOD ON STUDENTS' ACHIEVEMENT AND INTEREST IN FURNITURE CRAFT IN TECHNICAL COLLEGES IN NIGER STATE

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Abstract: *The study investigated the effect of mastery learning method on students' achievement and interest in furniture craft. Quasi-experimental design was adopted for the study, specifically, non-equivalent control group design. The study was carried out in Technical Colleges in Niger State. The sample for the study comprised of 80 TCII students from two intact classes, drawn using multi stage sampling techniques. The experimental group were taught using mastery learning method, while the control group was taught using conventional lecture method. The treatments lasted for four weeks. Two instruments were used for data collection in the study namely; Furniture Craft Achievement Test (FCAT) and Furniture Craft Interest Inventory Scale (FCIIS). Data collected were analysed using mean, standard deviation and Analysis of Covariance (ANCOVA). The results revealed that mastery learning method was superior to conventional instructional method in facilitating students' achievement and interest in furniture craft. On the test of interaction, it was revealed that mode of instruction (method) had a significant ordinal interaction effect on students' achievement and interest in furniture craft. Mastery learning method was more effective than the conventional method. Based on the findings of the study, the educational implications of the findings were highlighted and the following recommendations were proffered among others: that science teachers, and science teacher educators should adopt mastery learning instructional method when teaching in order to enhance students' achievement and interest in furniture craft.*

Keywords: *Mastery Learning Method, Furniture Craft, Achievement, Interest, Technical Education*

Introduction

Technical education, of which furniture craft is a part, is that aspect of education, which involves the acquisition of techniques and application of the knowledge of the science for the improvement of man's surrounding. It deals with the training of manpower from professional category such as engineers and technologists through the technician down to the skilled category, which includes craftsmen and artisans (Miller, 2014). The contribution of furniture craft to the development of a nation cannot be disputed as this profession is embraced and recognized worldwide. Furniture craft in the Technical Colleges is trade programme that is aimed at studying the Technical competencies in trade-related areas which include furniture making, carpentry and joinery machine woodworking shop practice. Furniture craft according to Vilaton (2010) refers to activities of using wood for the purpose of construction and other associated project and design activities. Teaching furniture craft at the Technical Colleges requires good teaching skills and mastery of the subject matter. For the Technical College graduates to be well trained in furniture craft, their teachers must have possessed the needed competencies for teaching the subject at the Technical colleges. Teaching is a complex exercise, which involves systematic interaction with learners in order to enable them acquire life-long skills, live good lives, improve upon existing standards and also solve social as well as economic problems when the need arises. The teachers of furniture craft should try to make class activities interesting to the students. This can be done by identifying the needs and interests of the students and thereby incorporate them into the class activities. Making use of a variety of methods to teach furniture craft can help to attract and maintain the interest of the students to take active part in the subject. This will make mastery of the subject easy and successful in examination. The implication of the use of different methods in teaching furniture craft is that it will affect the attitudes and behaviour of students positively.

Mastery learning has been one of the more recently developed instructional models and interventions used by teachers to foster academic enhancement among students. Mastery Learning is one teaching model under the behavioural systems family of models (Filgona *et al.*, 2017). It is an instructional strategy proposed by Benjamin in 1968 which upholds that students must attain a level of mastery in requirement knowledge before stirring to learn the succeeding information. If students do not succeed mastery in the test, they would be given extra support by reviewing the lesson and undergo retest. This exercise continues until the learner has mastered before moving to the next unit of instruction. Dawodu (2017) has shown concern over the need to develop student cognitive, affective and psychomotor skills in order to enhance their cognitive achievement in Technical education of which furniture craft is one. Moreover, Olaitan *et al.* (2011) have stressed the need to modify teaching methods to incorporate the techniques that would establish a firm foundation for acquisition of both knowledge and skills, which are necessary steps for technological capabilities and positive instructional development. According to Okebukola (2010) specific acts are adopted by teachers to inject varieties in their teaching, stimulate and maintain the learners' academic achievement, interest and retention in the lesson all in a bid to sustain the students interest. Okebukola maintained that instructional techniques are subsumed in teaching methods as ancillaries to ensure the effectiveness of the teaching methods. Improvement on the academic achievement and interest of students of furniture craft in Technical Colleges needs to be taken seriously so that there would be better achievement in the NABTEB examinations. Epunam (2009) defined achievement as the learning outcomes which include knowledge, skills that are acquired and retained through course of study within and outside the classroom situation that can help to have a better achievement in public examination.

Academic achievement has been described as a view on how well an individual has done his cognitive tasks. It may also be regarded as the general ability of students concerning their offered subjects compared to a specified standard called Pass Marks' (Abubakar, 2013). To him, this pass mark is relative and can be arbitrarily defined as 40% or 50%. Students' achievement in vocational and technical education according to Beesley (2012) is defined as the learning outcomes of student which include the knowledge, skills and ideas acquired and retained through his course of studies within and outside the classroom situation. Instructional method rooted in Jigsaw cooperative and mastery learning method seem to provide a learning environment that gives students deeper engagement in the learning process which may influence students' interest in learning.

Interest is an important factor in learning, it is viewed as the feeling that an individual has when he or she wants to know or learn more about something such as Woodwork technology. Obodo (2004) contended that interest is the attraction, which forces or compels a child to respond to a particular stimulus. In other words, a child develops interest if a particular stimulus (e.g. teaching method or school subject) is attractive and arousing or stimulating. This means that the child is bound to pay attention as a lesson goes on if he is interested in that particular lesson. Bayraktar (2014) maintained that interest comes as a result or eagerness of curiosity to learn not by force. Interest is an important variable in learning because if a student has positive interest towards a particular subject he or she not only enjoys studying the subject but would also derive satisfaction from the knowledge of the subject. This study will therefore, ascertain if students' achievement and interest in studying Furniture Craft will reflect after being exposed to mastery learning method.

Statement of the study

The poor performance of candidates in Furniture Craft as reflected by the NABTEB Examinations results has continued to trigger a lot of concern among educationists and other stakeholders nationally over the years. This poor performance in Furniture Craft among other factors is likely to undermine by the teaching method used. According to Aronson (2014), students' performance excels when cooperative learning strategies, including jigsaw are implemented. The Teaching method is a crucial factor that may affect students' motivation and consequently achievement. However, what is not known is how mastery learning method affects motivation to learn Furniture Craft by Gender. The decision to research on mastery learning strategy in technical colleges in Niger State is based on reality that most of schools embrace traditional learning strategy.

Purpose of the study

In an attempt to address this issue the present study explored effects of mastery learning method on motivation to learn Furniture Craft in Technical Colleges in Niger State. Specifically, it seeks to:

1. Find the effects of mastering learning method and lecture teaching methods on students' mean achievement scores in furniture craft in technical colleges in Niger state.
2. Establish the effects of mastering learning method and lecture teaching methods on students' mean interest scores in furniture craft in technical colleges in Niger state.

Research questions

1. What is the effect of mastering learning method and lecture teaching methods on students' mean achievement scores in furniture craft in technical colleges in Niger state?
2. What is the effect of mastering learning method and lecture teaching methods on students' mean interest scores in furniture craft in technical colleges in Niger state?

Hypotheses

H₀₁: There is no significant difference in the mean achievement scores of students taught furniture craft using mastering learning method and lecture methods.

H₀₂: There is no significant difference in the mean interest scores of students taught furniture craft using the two methods.

Methodology

The design for the study is quasi-experimental design. All the TCII students in all the technical colleges in Niger State form the population of the study. Eighty (80) TCII students were drawn using multi-stage sampling technique as the study sample. Two instruments: Furniture Craft Achievement Test (FCAT) and Furniture Craft Interest Inventory Scale (FCIIS) were developed by the researchers and used for the study. The research instruments was validated by three experts. The Furniture Craft Achievement Test (FCAT) was trial tested on 20 students at Federal Technical College, Orozo-Abuja which is not in the study area. Furniture Craft teachers in the sampled schools helped the research in collection of data. The scores obtained from the pre-test and post-test were analysed using mean and standard deviation for research questions and Analysis of Covariance (ANCOVA) for testing the hypotheses at 0.05% level of significance.

Results

Table 1: Distribution of Students' Mean Achievement Scores in Furniture Craft

Group	N	Pre-test		Post-test		Mean Gain Score
		\bar{X}_1	SD ₁	\bar{X}_2	SD ₂	
Mastering Learning Method	47	38.96	11.63	65.72	16.63	26.76
Lecture Method	33	41.79	10.96	57.89	10.51	16.1

Note: N = Number of Students, SD₁ = Standard Deviation for Pre-test, SD₂ = Standard Deviation for Post-test, \bar{X} = Mean Scores

The data on students' achievement in Table 1 revealed that students taught Furniture Craft using mastering learning method had mean score of 65.72 with standard deviation of 16.63 while the mean achievement score of students taught with conventional lecture method was 57.89 with standard deviation of 10.51. Also the mastering learning method group had a gain score of 27.51 over the lecture group who had a gain score 16.10, of Students taught Furniture Craft using mastering learning method therefore, performed better than students taught using the conventional lecture method.

Table 2: Distribution of Students' Mean Interest Scores in Furniture Craft

Group	N	Pre-test		Post-test		Mean Gain Score
		\bar{X}_1	SD ₁	\bar{X}_2	SD ₂	
Mastering Learning Method	47	1.55	0.65	2.56	0.66	1.01
Lecture Method	33	1.51	0.63	2.24	0.94	0.73

Note: N = Number of Students, SD₁ = Standard Deviation for Pre-test, SD₂ = Standard Deviation for Post-test, \bar{X} = Mean Scores

The data on students' interest in Table 2 revealed that students taught Furniture Craft using mastering learning method had mean interest score of 2.54 with standard deviation of 0.66 while the students taught with conventional lecture method had mean interest scores of 2.23 with standard deviation of 0.94. The students taught Furniture Craft had gain score of 1.01 while their counterpart taught using conventional method had mean gain score of 0.73. This revealed that students taught Furniture Craft using mastering learning method therefore, had higher interest in Furniture Craft than students taught using the conventional lecture method. Therefore, mastery learning method is superior to conventional method.

Table 3: Analysis of Covariance of Students' Mean Achievement Scores in Furniture Craft

Sources of Variation	Sum of Square	df	Mean Square	F	Sig
Corrected model	11613.487	4	2903.372	37.258	.000
Intercept	2623.714	1	2623.714	33.669	.000
Pretest	9974.333	1	9974.333	127.996	.000
Method	2128.256	1	2128.256	27.311	.000
Error	5844.501	75	77.927		
Total	329833.000	80			
Corrected Total	17457.987	79			

Data in Table 3 showed that there is a significant mean effect for mode of instruction on students achievement in Furniture Craft $f(1, 80) p < .000$. The null hypothesis therefore was rejected, indicating that there was significance difference in the mean achievement score of students taught Furniture Craft using mastering learning method and those taught using conventional instructional method.

Table 4: Analysis of Covariance of Students' Mean Interest Scores in Furniture Craft

Sources of Variation	Sum of Square	Df	Mean Square	F	Sig
Corrected model	30.339	3	10.113	38.304	.000
Intercept	430.050	1	430.050	1628.871	.000
Method	2.875	1	2.875	10.888	.000
Total	522.504	80			
Corrected Total	50.404	79			

Table 4 revealed no significant mean effect of gender on student's interest in Furniture Craft $f(1, 80) p > .001$. The null hypothesis was not rejected, indicating that there was no significant difference in the mean interest scores of students taught Furniture Craft using mastering learning method.

Findings and discussion

The mastering learning method of instruction was superior to the conventional method in facilitating student's achievement in furniture craft. The differences in performance might have been because of the fact that the students were required to find out facts for themselves, thereby imbibing the scientific processes involved in learning furniture craft, which enabled them to perform better than their counterparts taught furniture craft using conventional method. When the students generate their own question, analyse and discuss their findings and finally construct their understanding they seemed to understand their own information better than the ones the teachers introduced to them. The mastering learning method may have been more effective because the instructions were characterized by active student's involvement, thereby capturing the interest of the students and maximizing comprehension of the subject matter. This is in line with the observations of Nwagbo (2009) and Ibe (2014) who indicated that instructional approaches prove to improve student's achievement in sciences more than the traditional instructional methods like lecture, demonstration. Also Awodi and Timothy (2011) revealed a significant difference between inquiry and lecture method in improving student's performance in biology achievement test in favour of the inquiry approach.

The findings of this study are in line with that of similar studies by Ibe and Nwosu (2014) who carried out a study on the effects of mastering learning method and demonstration methods of teaching on science process skills acquisition among secondary school biology students. Their finding revealed that the student taught through mastering learning method performed significantly better than those taught through demonstration and conventional (lecture) methods. Results obtained from the study showed that students taught with mastering learning method had high interest in furniture craft than their counterparts that were taught with conventional method. The finding is in agreement with that of Ezeudu (2012) who found out that student centred instructional approach enhances student's interest in science. Okoro (2011) found out that student's interaction pattern promotes student's interest in biology than the conventional instructional approach. Students perform better when they work in groups, they share ideas. This increase their interest especially when taught furniture craft using mastering learning method

Conclusion

From the results obtained in the study on the effects of mastery learning method on student achievement in furniture craft, it was found out that students taught furniture craft using mastery learning method performed better than their counterparts taught furniture craft using the lecture method. Students taught furniture craft using mastery learning method had higher mean interest score in furniture craft than their counterparts taught furniture craft using the lecture method.

Recommendations

1. The Ministries of Education should ensure that textbook authors incorporate mastery learning methods in the instructional methods for secondary schools.
2. The Ministry of Education should ensure that their teachers are trained regularly on the use of innovative instructional approaches e.g. mastery learning method
3. Curriculum planners should ensure that they incorporate mastery learning methods in furniture craft curriculum, as it will help to promote students' achievement and interest in the subject.

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