

Effects of Kolb's Experiential Learning and Gardner's Multiple Intelligence Learning Models on Students' Interest in Electrical Installation and Maintenance Work

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Abstract

This study investigated the effects of Kolb's experiential and Gardner's multiple intelligence learning models on students' interest in Electrical Installation and Maintenance work. Two research questions guided the study while three hypotheses formulated were tested at 0.05 level of significance. The study adopted a quasi-experimental treatment group design and it was carried out in North West Nigeria. The population for the study was 903 National Technical Certificate II (NTC II) students offering Electrical Installation and Maintenance work in technical colleges in North-West, Nigeria. The simple random sampling technique was used to select 127 students consisting of 109 male and 18 female students assigned to two treatment groups using intact class. The instrument used for data collection was Electrical Installation and Maintenance work Interest Inventory (EIII). The instrument was developed by the researchers. To ensure content validity, the instrument was subjected to face and content validation by five experts. The internal consistency of the instrument was determined by using Pearson moment correlation coefficient of reliability 0.84. The data collected was analyzed using Mean to answer the two research questions while ANCOVA was used to test the three null hypotheses. The study found out, among others, that Gardner's multiple intelligence learning model was more effective than Kolb's experiential learning model in improving student's interest in Electrical Installation and Maintenance Work. There was an influence of gender on students' interest favoring males. However, gender had significant influence on students' interest. The study found a significant interaction effect of methods and gender on students interests'. The study recommended among others that NBTE should incorporate Gardner's multiple intelligence learning model in the teaching/learning of Electrical Installation and Maintenance Work in Technical Colleges. In addition, workshops, seminars and conferences should be organized by Federal Ministry of Education and States Science and Technical Schools Management Board for teachers to enable them update their knowledge and skills on the use of Gardner's multiple intelligence learning model for improving students' interest in Electrical Installation and Maintenance Work.

Keyword: Electrical installation and Maintenance Work, Interest, Learning Model, Technical College and Gender

Introduction

The potentials of Electrical Installation and Maintenance work in providing the desired national sustainability is mirrored in the intents of its inclusion in the curriculum of Technical Colleges, it is glaring that the pace of technological transformation has been very rapid in recent times precipitating numerous challenges on daily basis. Inherently, issues challenging the sustainable existence of humankind and general wellbeing such as automation, globalization, workplace change and policies increasing personal responsibility are growing. These have necessitated a need to equip current and future citizens in general and Electrical Installation and Maintenance Work students in particular, with skills to address the rapidly evolving technology needs and challenges of the 21st century (Sani, 2018). The learning experience is aimed at the acquisition of appropriate level of literacy, numeracy, manipulation and life skills for useful living within the society {Federal Republic of Nigeria, (FRN, 2004)}. However, these skill objectives are yet to be achieved in technical colleges. As a result, poor interest of students in learning Electrical Installation and Maintenance Work have been recorded in recent times. Technical and Vocational educators have identified some factors militating against the attainment of the objectives to include teachers' methodology and strategies. To acquire the relevant learning experiences and skills in electrical installation and maintenance work for example, requires the use of relevant instructional methods and techniques

Instructional methods and techniques are ways by which teachers present their course materials to learners and engage them in the task of learning the curriculum contents. Instructional methods and techniques are the tools used by the teacher for actualizing the set aims and objectives (Bello and Aliyu 2013). If the tools are faulty or inappropriate, the aims and objectives of the teaching and learning will not be achieved. It is clear from the foregoing that the possibility of Electrical Installation and Maintenance work to provide the needed solutions to the challenges of the millennium depends on the ability of Electrical Installation and Maintenance work teachers to select and maximally utilize appropriate instructional techniques and methods for their lesson delivery. The teaching methods are expected to reflect a modern society mandating the need for functioning, thinking-oriented, decision-making students. There is an overall lack of political and public confidence in Technical College training systems and a profound mismatch between the radically new key competencies demanded from students in the knowledge society and the teaching skills that teachers are equipped with, in teacher training institutions (Abdullahi, 2010). Nevertheless, the need for exposing the prospective students of Electrical Installation and Maintenance work to quality knowledge and skills, both practical and cognitive, remains a necessity. Technical educators maintain that the task can only be accomplished with a radical change from the use of teacher-centered approach in Technical college programmes to the use of student-centered approaches such as the Kolb's experiential learning model (Nwosu, 2015).

Kolb's experiential learning model is one of the widely used models. University of phoenix (2017) popularized experiential learning model as the most efficient method for mastering new concepts. This model takes its root from Kolb's learning cycle. Kolb's Learning Cycle is a well-known theory which argues human beings learn from their experiences of life, even on an everyday basis. This also treats reflection as an integral part of such learning. University of Leicester (2017) reported that experiential learning theory provides a holistic model of the learning process and is a multi-linear model of adult development, both of which are consistent with what people know about how they naturally learn, grow, and develop. According to Kolb (1984), the process of learning follows a pattern or cycle consisting of four stages, one of which involves what Kolb refers to as 'reflective observation'. According to Kolb in the report of University of Phoenix (2017) knowledge results from the combination of grasping experience and transforming it. In Kolb's experiential learning model, there are four distinct segments to learning: description of concrete experience, reflections, generalizations/principles/theories and testing and application. Kolb's experiential learning model according to Kolb and Kolb (2005), sets out four distinct learning styles (or preferences), which are based on a four-stage learning cycle (Which might also be interpreted as a 'training cycle') in which 'immediate or concrete experiences' provide a basis for 'observations and reflections'. The observations and reflections' are assimilated and distilled into 'abstract concepts' producing new implications for action which can be 'actively tested' in turn creating new experiences. Kolb and Kolb (2005), further explained that ideally (and by inference not always) this process represents a learning cycle or spiral where the learner 'touches all the bases, i.e. a cycle of experiencing, reflecting, thinking, and acting. Immediate or concrete experiences lead to observations and reflections. These reflections are then assimilated (absorbed and translated) into abstract concepts with implications for action, which the person can actively test and experiment with, which in turn enable the creation of new experiences. Kolb (1984) model therefore works on two levels - a four-stage cycle: Concrete Experience - (CE), Reflective Observation - (RO), Abstract Conceptualization - (AC) and Active Experimentation - (AE), and a four-type definition of learning styles, (each representing the combination of two preferred styles, rather than a two by-two matrix of the four-stage cycle styles), for which Kolb used the terms: Diverging (CE/RO), Assimilating (AC/RO), Converging (AC/AE) and Accommodating (CE/AE).

The experiential learning model is acknowledged by academics, teachers, managers and trainers as fundamental concepts towards understanding and explaining human learning behaviour, and towards helping others to learn (Zagorac, Ivanis, Nuhbegovic, & Steiner, 2008). According to Greenway (2004), experiential learning model finds its application in a wide range of disciplines, especially in education and computer science to improve students' learning abilities. Kolb's experiential learning model, just like Gardner's multiple intelligence model, aimed at improving learning. Experiential styles refer to the preferred way individual processes

information. The style is usually described as a personality dimension which influences attitudes, values, and social interaction.

Gardner's Multiple Intelligence Learning Model is a modern model that takes its root from the theory of multiple intelligences who suggests that the traditional notion of intelligence, based on intelligent quotient (IQ) testing, is far too limited. Gardner's Multiple Intelligence Learning Model according to Armstrong (2009) has eight different intelligences to account for a broader range of human potential in children and adults. Gardner also emphasizes the cultural context of multiple intelligences. Each culture tends to emphasize particular intelligence, suggests that there are a number of distinct forms of intelligence that each individual possesses in varying degrees. According to Gardner, the implication of the model is that learning/teaching should focus on the particular intelligence's of each person. For example, if an individual has strong spatial or musical intelligence's, they should be encouraged to develop these abilities. Gardner points out that the different intelligence's represent not only different content domains but also learning modalities.

In explaining multiple intelligences model, Gardner claims that all humans have eight intelligences, to a lesser or greater extent, and that each human have a different intelligence profile. This profile is based on genetics and experiences, and makes it unique from others. The intelligences are as follows: Linguistic intelligence is the ability to use spoken and written language effectively to express oneself; Logical-mathematical intelligence is the ability to analyze problems logically, work effectively with mathematical operations, and investigate issues using the scientific method. Finding patterns and deductive reasoning are other capabilities associated with this intelligence; Musical intelligence is the ability to perform, compose, and appreciate musical patterns, including changes in pitch, tone, and rhythm; Bodily-kinesthetic intelligence is the ability to use the body for expression. People high in this intelligence use their physical coordination to master problems; Spatial intelligence is the ability to recognize, use, and interpret images and patterns and to reproduce objects in three dimensions; Interpersonal intelligence is the ability to understand people's intentions, motivations, and desires. The intelligence allows individuals to work well with others; Intrapersonal intelligence is the ability to understand one, and to interpret and appreciate ones' own feelings and motivations; Naturalist intelligence is the ability to recognize and appreciate relationship with the natural world. Kolb's experiential learning model and Gardner's Multiple Intelligence Learning Model have been found to be an effective technique for increasing interest of students in concepts in computer science among others in non-technical institutions unlike technical colleges.

Technical college is a type of secondary school established either by government or individual to offer technical and vocational trades leading to acquisition of knowledge and

skills required for further studies or employment. Bakare (2009) defined technical college as a post primary institution equivalent to secondary school charged with the production of craftsmen and technicians. Technical colleges offer various technical and vocational trades and some of the trades include motor vehicle and mechanic work, radio and television, refrigeration and air conditioning, furniture and cabinet making, welding and fabrication, block laying and concrete work and electrical installation and maintenance work. FRN, (2004) stated that the length of trades in a technical college, like other senior secondary schools shall be three years for the craft level and four years for the advanced craft level and National Business and Technical Examinations Board (NABTEB) shall award National Technical Certificate (NTC), National Business Certificate (NBC), Advanced National Technical Certificate (ANTC), and Advanced National Business Certificate (ANBC) to the successful graduates of technical colleges. Electrical installation and maintenance work offer in technical colleges is geared towards the graduation of technicians, and craftsmen who have skills and knowledge to meet the demand of electrical/electronic industries.

Electrical installation and maintenance work (EIMW) is one of the trades offered in Technical Colleges in Nigeria. Bakare (2010) described EIMW as electrical engineering trade offered in Nigerian technical colleges which has Battery Charging and maintenance, Domestic Installation, Industrial Installation, Cable Jointing, Winding of Electrical Machines and Solid State Devices as its components. According to National Board for Technical Education (2007), EIMW was incorporated into the curriculum of technical colleges to facilitate the attainment of the objective on maintenance, service, and installation of electrical equipment and machines. In EIMW according to Bakare (2010), students learn basic practical skills needed to install, operate, maintain, and repair electrical and electronic equipment.

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). Hanson (2009) stated that provision of an engaged learning environment promotes students Interest in learning. This means that when Electrical Installation and maintenance work students are involved in the learning process, learning is facilitated and achievement can be enhanced. Students' Interest in Electrical Installation and maintenance work activity can therefore, be sustained by the active involvement of the student in all aspects of the learning process. It was also identified as the Intention Used By Individuals To Approach Success And Avoid Failure (Oh. Jia, Lorentson And Labanca, 2012). In Other Words Student's Interest In An Electrical Installation And Maintenance Work Activities Increases The Strength Of Their Go-Involvement And Does Not Allow The Student To Be Distracted By Trivial Extraneous Events Around Him/Her.

Gender According To Santrock (2001) Involves The Biological Dimension Of Being A Female Or Male. This Has Been A Crucial Matter To The Educationists. Issues That Are Multidimensional In Outlook As They Relate To The Teaching And Learning Of Technical Education In This Regard Have Been Very Contentious. Providing Quality Education Ensures Sustainable Development, Adapting An Approach That Takes Into Account The Relationship And Interaction Between Males And Females. However, Literature Abound With Statistics That Gender Parity Could Be Established In Science And Technology Classes That Emphasize Hands-On/Activity Based Instructional Strategies. In View Of The Fact That Model Methods Such As The Inductive And Deductive Inquiry Have Been Used As Well As Other Activity Based Strategies Such As Cooperative Learning On Gender Issues In Electrical Installation And Maintenance Work, The Result Is Still Inconclusive. Hence, There Is The Need To Try The Kolb's Experiential Learning Model (KELM) And Gardner's Multiple Intelligence Learning Model (GMIM) And Ascertains Its Impact On Critical Thinking Of Both Male And Female Electrical Installation And Maintenance Work Students.

Methodology

The Study Used Quasi Experimental Treatment Group Design Aimed At Investigated The Effects Of Kolb's Experiential And Gardner's Multiple Intelligence Learning Models On Students' Interest In Electrical Installation And Maintenance Work In. Two Research Questions Guided The Study While Three Hypotheses Formulated Were Tested At 0.05 Level Of Significance. The Population For The Study Was 903 National Technical Certificate II (NTC II) Students Offering Electrical Installation And Maintenance Work In Technical Colleges In North-West, Nigeria. The Simple Random Sampling Technique Was Used To Select 127 Students Consisting Of 109 Male And 18 Female Students Assigned To Two Treatment Groups Using Intact Class. The Instrument Used For Data Collection Is Electrical Installation And Maintenance Work Electrical Installation And Maintenance Work Interest Inventory (EIII). The Instrument Was Developed By The Researcher. To Ensure Face And Content Validity Of The Instrument, The Instrument Was Validated By Five Experts. One In Measurement And Evaluation, One In Education Psychology, Drawn From Both Departments Of Science And Adult Education And Two In Electrical Technology Department Of Industrial Technical Education All From University Of Nigeria, Nsukka, And One In Electrical Installation And Maintenance Work From Government Technical College Malali, Kaduna. To Establish The Reliability Of The Instrument, The Instrument Was Carried Out On 30 Sampled NTCII Students At Government Technical College Soba, Kaduna State In North-West Geo-Political Zone Of Nigeria. The Pearson Moment Correlation coefficient was used to determine the internal consistency of the instrument. The reliability coefficient of the instrument was found to be 0.84. The data collected were analyzed using Mean to answer the two research questions while ANCOVA was used to test the three null hypotheses.

Results

- Research Question1:** What is the Effect of KELM and GMIM on students' Interest in Electrical Installation and Maintenance Work?

Table1: Mean and Standard Deviation of Pretest and Posttest Scores of Kolb's Experiential Learning Model and Gardner's Multiple Intelligence Learning Model Groups on Interest in the Electrical Installation and Maintenance Work.

Group	N	Pre test		Post test		Mean Gain
		\bar{X}	SD	\bar{X}	SD	\bar{X}
KELM	82	76.47	6.50	96.32	2.06	19.85
GMILM	45	72.77	8.84	95.35	3.47	22.58

The result presented in Table 1 show that Kolb's experiential learning model group had a Mean score of 76.47 and Standard Deviation of 6.50 in the pre-test and a Mean score of 96.32 and Standard Deviation of 2.06 in the post-test making a pre-test, post-test Mean gain of 19.85. Gardner's multiple intelligence learning model group had a Mean score of 72.77 and Standard Deviation of 8.84 in the pre-test and a post-test Mean of 95.35 and Standard Deviation of 3.47 with a pre-test, post-test Mean gain of 22.58. With these results, both Gardner's multiple intelligence learning model and Kolb's experiential learning model are effective in improving students' Interest in Electrical Installation and Maintenance Work, but Gardner's Multiple intelligence learning model improved students' Interest in Electrical Installation and Maintenance Work than Kolb's experiential learning model.

- Research Question2:** What is the influence of Gender on students' Interest in Electrical Installation and Maintenance Work?

Table 2 : Mean and Standard Deviation of Pretest and Posttest on the Influence of Gender on Interest Inventory Scores of Students Taught Using Kolb's Experiential Learning Model and Gardner's Multiple Intelligences Learning Model

Group	Gender	N	Pretest scores		Posttest scores		Mean Gain
			\bar{X}	SD	\bar{X}	SD	\bar{X}
KELM	M	74	76.98	6.34	92.67	7.65	15.69
	F	8	71.75	6.51	86.25	7.66	14.5
GMIM	M	35	73.14	9.03	96.57	2.14	23.43
	F	10	71.50	8.47	91.10	3.98	19.6

The data presented in Table 2 show the influence of gender on Electrical Installation and Maintenance Work student's Interest when exposed to Kolb's experiential learning model. Result shows that the male students taught with Kolb's experiential learning model had a

pretest mean of 76.98 with a standard deviation of 6.34 and a post-test mean of 92.67 with a standard deviation of 7.65. The difference between the pre-test and post-test mean for the male students was 15.69. The female students taught using Kolb's experiential learning model had a pre-test mean of 71.75 with a standard deviation of 6.51 and a post-test mean of 86.25 with a standard deviation of 7.66. The difference between the pre-test and post-test mean for the female students was 14.5. Hence, the female students taught with Kolb's experiential learning model achieved higher (15.69 > 14.5) than their male counterparts. Also the data presented in Table 15 show the influence of gender on students' interest when exposed to Gardner's Multiple Intelligence Learning Model. Result shows that the male students taught with Gardner's Multiple Intelligence Learning Model had a pretest mean of 73.14 with a standard deviation of 9.03 and a posttest mean of 96.57 with a standard deviation of 2.14. The difference between the pretest and posttest mean for the male students is 23.43. The female students taught using Gardner's Multiple Intelligence Learning Model had a pretest mean of 71.50 with a standard deviation of 8.47 and a posttest mean of 91.10 with a standard deviation of 3.98. The difference between the pretest and posttest mean for the female students was 19.6. Hence, the males students taught with Gardner's Multiple Intelligence Learning Model achieved higher (23.43 > 19.60) than their female counterparts. Therefore, there is gender influence on students' Interest in Electrical Installation and Maintenance Work.

Hypotheses.

Ho₁: There is no significant difference in the Effects of Kolb's Experiential Learning Model and Gardner's Multiple Intelligences Learning Model on students' Interest in Electrical Installation and Maintenance Work.

Ho₂: There is no significant difference in the influence of Gender on students' Interest in Electrical Installation and Maintenance Work.

H₀₃: There is no significant Interaction effect of Learning Models and Gender on Students' Interest in Electrical Installation and Maintenance Work.

Table 3: Analysis of Covariance (ANCOVA) of the Difference in the Mean Interest Scores of Electrical Installation and Maintenance Work Students Taught with KELM and those Taught with GMIM

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	3198.521 ^a	4	799.630	36.906	0.000
Intercept	2803.728	1	2803.728	129.404	0.000
Pretestinterest	2349.881	1	2349.881	108.457	0.000
Gender	222.490	1	222.490	10.269	0.002
Method	463.412	1	463.412	21.388	0.000
method * gender	5.180	1	5.180	0.239	0.626
Error	2643.306	122	21.666		
Total	1109479.000	127			
Corrected Total	5841.827	126			

a. R Squared = .548 (Adjusted R Squared = .533)

***Significant at sig of $F < 0.05$**

The results in Table 3 showed that an F-ratio of 10.26 with associated probability value of 0.002 was obtained with regard to the difference in the influence of gender in the mean interest scores of Electrical Installation and Maintenance Work students taught with Kolb's experiential learning model and those taught with Gardner's multiple intelligence learning model. Since the associated probability (0.002) is less than 0.05, the null hypothesis (H₀₃) of no significant mean difference between the influence of gender (male and female) on students' interest in Electrical Installation and Maintenance Work was rejected. Hence, there is significant difference in the mean interest scores of male and female students when exposed to Kolb's Experiential Learning Model and Gardner's Multiple Intelligence Learning Model. This implies that the use of Kolb's Experiential Learning Model and Gardner's Multiple Intelligence Learning Model result in significant difference in the mean interest scores of male and female Electrical Installation and Maintenance Work students.

The results in Table 3 also showed that the interaction effect of methods and gender has an F-ratio of 0.239 with associated probability value of 0.626 was obtained with regard to the difference in the mean interaction effect of Learning Models and Gender on interest scores of students taught with Kolb's experiential learning model and those taught with Gardner's multiple intelligence learning model. Since the associated probability (0.629) is greater than 0.05, the null hypothesis of no significant Interaction effect of Learning Models and Gender on Student's interest was accepted. Hence, this implies that the use of Kolb's Experiential Learning Model and Gardner's Multiple Intelligence Learning Model result in no difference in the mean interaction effect of methods and gender on students' interest scores in Electrical Installation and Maintenance Work.

The results in Table 3 show that the interaction effect of methods and gender has an F-ratio of 0.239 with associated probability value of 0.626 was obtained with regard to the difference in the mean interaction effect of Learning Models and Gender on interest scores of Electrical Installation and Maintenance Work students taught with Kolb's experiential learning model and those taught with Gardner's multiple intelligence learning model. Since the associated probability (0.626) is greater than 0.05, the null hypothesis of no significant Interaction effect of Learning Models and Gender on Student's interest in Electrical Installation and Maintenance Work was accepted. Hence, there is no significant difference in the mean interaction effect of Learning Models and Gender on interest scores of Electrical Installation and Maintenance Work students when exposed to Kolb's Experiential Learning Model and Gardner's Multiple Intelligence Learning Model. This implies that the use of Kolb's Experiential Learning Model and Gardner's Multiple Intelligence Learning Model result in no significant difference in the mean interaction effect of methods and gender on interest scores in Electrical Installation and Maintenance Work students.

Results of Hypothesis 1, 2 & 3

There is significant difference in the effect of Kolb's Experiential Learning Model and Gardner's Multiple Intelligences Learning Model on methods, gender and no interaction effect of methods and gender of students' Interest in Electrical Installation and Maintenance Work.

Discussion of Findings

The data presented in Table 1 provided answer to research question 1. Findings revealed that Kolb's experiential learning model and Gardner's multiple intelligence learning model are effective in improving students' interest in Electrical Installation and Maintenance Work, but the effect of Gardner's multiple intelligence learning model in improving students' interest in Electrical Installation and Maintenance Work is higher than Kolb's experiential learning model. However, analysis of covariance was employed to test hypothesis 1 (Table 3) at an F-ratio of 21.38 with associated probability value of 0.000 was obtained with regards to the difference in the mean scores of Electrical Installation and Maintenance Work students taught with Kolb's experiential learning model and those taught with Gardner's multiple intelligence learning model. Since the associated probability (0.000) was less than 0.05, the null hypothesis (H_{01}) was rejected. The result revealed that the null hypothesis of significant mean difference between the effect of Kolb's experiential learning model and Gardner's multiple intelligence learning model in the Electrical Installation and Maintenance Work interest inventory was rejected. The result means that there was significant mean difference between the effect of Kolb's experiential learning model and Gardner's multiple intelligence learning model on students' psychomotor achievement in Electrical Installation and Maintenance Work.

The above findings are consistent with the findings of Okorieocha (2010), Owodunni (2010) and Jimoh (2010) who, in their separate studies in other subjects found that the Multiple Intelligence based instructions had significant effect upon the students' interest than other instructional formats. Hanson (2009) stated that provision of an engaged learning environment promotes students Interest in learning. This means that when Electrical Installation and maintenance work students are involved in the learning process, learning is facilitated and achievement can be enhanced. Students' Interest in Electrical Installation and maintenance work activity can therefore be sustained by the active involvement of the student in all aspects of the learning process. Krapp and Prenzel (2011), Explained that interest-driven actions involve personally valued objects or activities; they are accompanied by positive emotions and are self-intentional. Practical activity in Gardner's multiple intelligence learning model

group, aimed at addressing and developing students' visual-spatial through authentic instruction. This connects the lesson to real- situation: Use real objects, tools, machines and materials. Use simulation, models, visual aids, charts and illustrations. Teachers of Electrical Installation and Maintenance Work should allow students to participate actively in the lesson by expressing their views freely, offering suggestions and opinions and asking questions. Encourage active interaction among students and between students and the teacher thereby, improved Electrical Installation and Maintenance Work students' problem solving abilities. This seems to have positive effects on students' interest in studying Electrical Installation and Maintenance Work.

The data presented in Table 2 provided answer to research question two. Findings revealed that gender has influence on students' interest in Electrical Installation and Maintenance Work when exposed to Kolb's experiential learning model and Gardner's multiple intelligence learning model in favour of male students. This means that there was influence of gender on students' interest in studying Electrical Installation and Maintenance Work in favour of males. However, analysis of covariance was used to test hypotheses two (Table 3) at an F-ratio of (10.26) with associated probability value of (0.002) was obtained. Since the associated probability (0.002 was less than 0.05, the null hypothesis (H_{02}) was rejected. The result mean that the null hypothesis of no significant mean difference between the influence of gender on students' interest in Electrical Installation and Maintenance Work was rejected. This means that the mean difference between the influences of gender on students' interest was statistically significant in favour of female students.

The result above disagrees with the findings of Jimoh (2010) who found out that there was no significant difference between the mean interest scores of male and female students in Engineering Graphics Interest Inventory. However, the finding of this study with regard to the influence of gender on students' interest in Electrical Installation and Maintenance Work in support of the findings of Okorieocha (2010) and Owodunni (2010) who both found a significant gender influence on students' interest towards basics electricity and Radio, Television and Electronic Work in favour of male students in Technical Colleges of Rivers and

Lagos State. The finding of the present study which revealed a significant mean difference between the effect of gender on students' interest in Electrical Installation and Maintenance Work in favour of female students could be attributed to socio-cultural factors particularly prejudices. Females, normally, are more interested in those courses (such as Home economics) which are traditionally regarded as being in the female domain. This contradicts the common view that certain technical and vocational programmes such as building technology and related trades are by their very nature meant for men.

Analysis of covariance was used to test the third hypothesis 3 (Table 3) at an F-ratio of (0.239) with associated probability value of (0.626) was obtained. Since the associated probability 0.626 was greater than 0.05, the null hypothesis (H_{O3}) was accepted. There was no significant interaction effect of methods and gender on students taught with Kolb's experiential learning model and Gardner's multiple intelligence learning model with respect to their mean scores in Electrical Installation and Maintenance Work interest inventory. This result implies that the effectiveness of Kolb's experiential learning model and Gardner's multiple intelligence learning model on students' interest in studying Electrical Installation and Maintenance Work depends not on the level of gender. Hence, there was no significant differential effect of methods and gender (male and female) on students' interest.

The finding of this study is found to be similar to that of Okorieocha (2010) who discovered that there was no significant interaction effect of treatment and gender on student interest in basic electricity. The outcome of the study is also similar to Jimoh (2010) who found out that there is no significant interaction effect of treatment and gender on students' interest in engineering graphics. The absence of interactive effect of method and gender on the students' interest in this study could be attributed to the fact that both Kolb's experiential learning model and Gardner's multiple intelligence learning model provided the opportunity for all the students irrespective of gender to be actively involved in interactive learning situations. The result, therefore, means that students' gender (male or female) will not be a barrier to the learning of Electrical Installation and Maintenance Work subject in technical colleges. Hence, Electrical Installation and Maintenance Work teachers are encouraged to accept the fact that gender issue (male or female) should not be seen as adversely influencing academic learning in Electrical Installation and Maintenance Work classroom.

Conclusions

Based on the findings of the study the following conclusions were made:

Kolb's experiential learning model and Gardner's multiple intelligences learning model are effective in enhancing students' interest in Electrical Installation and Maintenance Work. However, Gardner's multiple intelligences learning model is more effective than Kolb's experiential learning model. It was also concluded that there was significant difference in the interest of students taught with Gardner's multiple intelligence learning model when compared with those taught with Kolb's experiential learning model. Moreover, gender has influence on the students' interest when taught with Gardner's multiple intelligences learning model. The study also concluded that there was no significant difference in the interaction effects of methods and gender on students' interest when taught Electrical Installation and Maintenance Work with Gardner's multiple intelligences and Kolb's experiential learning models in the Technical Colleges of North-Western States of Nigeria.

Recommendations

Based on the findings, the following recommendations are hereby made:

1. The National Board for Technical Education (NBTE) curricular content packages in the minimum standard should be restructured to aid Electrical Installation and Maintenance Work students' training through Gardner's multiple intelligences learning model.
2. Technical College Teachers should use Gardner's multiple intelligences learning model in teaching Electrical Installation and Maintenance Work.
3. The state and local government in conjunction with the Federal Ministry of Education should endeavor to organize in-service training in form of workshops, seminars, conferences and symposia regularly for Electrical Installation and Maintenance Work Teachers to enable them update their knowledge, attitudes and skills on the use of innovative teaching strategies such as Gardner's multiple intelligences learning model.

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