

**TEACHERS' PERCEPTION IN THE APPLICATION OF STUDENT-CENTER
METHOD FOR TEACHING AND LEARNING OF RADIO, TELEVISION AND
ELECTRONICS WORK TRADE IN TECHNICAL COLLEGES IN NIGER STATE**

BY

AJIBADE, Abass Akintunde

2016/1/63809TI

**DEPARTMENT OF INDUSTRIAL AND TECHNOLOGY EDUCATION
SCHOOL OF SCIENCE AND TECHNOLOGY EDUCATION
FEDERAL UNIVERSITY OF TECHNOLOGY MINNA**

FEBRUARY, 2023

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**A RESEARCH PROJECT SUBMITTED TO THE DEPARTMENT OF INDUSTRIAL
AND TECHNOLOGY EDUCATION, FEDERAL UNIVERSITY OF TECHNOLOGY
MINNA, NIGER STATE**

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FEDERAL UNIVERSITY OF TECHNOLOGY MINNA**

FEBRUARY, 2023

DECLARATION

I, AJIBADE Abass Akintunde with matriculation number 2016/1/63809TI an undergraduate student of the department of Industrial and Technology Education certify that the work embodied in this project is original and has not been submitted in any part or full for any other diploma or degree of this or any other University.

Ajibade Abass Akintunde

2016/1/63809TI

Signature/Date

CERTIFICATION

This project has been read and approved as meeting the requirement for award of a B. Tech Degree in Industrial and Technology Education, School of Science and Technology Education, Federal University of Technology, Minna.

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DEDICATION

This project is dedicated to Almighty Allah, the most merciful, the most beneficent, the most gracious, the omnipresent and omniscient.

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My sincere gratitude to Almighty Allah, the most beneficent, the most merciful and the gracious for His strength and grace throughout my undergraduate programme. My profound gratitude to my supervisor, the head of department of industrial and technology education Dr. T.M Saba for his kind gesture, fatherly care, health criticism, profound advice and guidance towards the success of my project. May Almighty Allah bless you richly.

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ABSTRACT

The study to investigate teachers' perception in the application of student-center method for teaching and learning Radio, Television (RTV) and electronics work trade in Technical Colleges in Niger State. Three objectives were formulated to guide the study and three questions were raised to guide the study. Three hypotheses were formulated and tested at 0.05 level of significance. The study adopted descriptive survey design in which questionnaire was used to obtain the opinion of the respondents that are teachers. The study was carried out in Technical College in Niger State. The total population for this study comprise of one thousand two hundred and thirty eight (1238) students and thirty three (33) teachers in Technical colleges in Niger State. The target population of the study is one hundred and twenty (120) respondents. A simple random sampling technique was used to sample hundred (100) students and twenty (20) teachers from five technical college in Niger State. The findings of the study revealed that teachers shows attitude towards the application of student center method in the teaching and learning radio, TV and electronics work trade in Technical colleges. It was also revealed that result revealed the resources needed for implementing students centre methods for teaching and learning RTV in electronics work trade among them are computers, projectors, e-library, Interactive board and Consistent power supply. The study recommends that the Teachers of RTV should show positive attitude towards the implementation of student centre method so as to stimulate and motivate the students. It was also recommended that the school administrators and government should provide adequate and efficient resources for effective implementation of SCM.

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CHAPTER ONE

INTRODUCTION

1.0

1.1 Background to the Study

Technical colleges are geared towards producing craftsmen in various disciplines. Their existence, (Olaitan, 2017), is to stimulate technological and industrial development by developing and utilizing technologies for industrial and economic advancement. Technical college is an integral part of the total educational system. It contributes towards the development of good citizenship by developing the physical, social, civic, cultural and economic competencies of the individual (Sanni, 2016). The goals of technical colleges, as stated by Federal Ministry of Education (2014) are, to provide trained manpower in the applied sciences, technology and business, particularly at craft, advanced craft and technician levels; provide the technical knowledge and vocational skills necessary for agricultural, commercial and economic development; and give training and impart the requisite skills to individuals who shall be self-reliant economically and in tune with latest technology. In technical colleges, students are trained to acquire relevant knowledge and skills in different occupations for employment in the world of work (NBTE,2016).

Electrical and electronic trades are among the skilled areas studied in technical colleges. The trade, as offered in the technical college, comprise Electrical Installation and Maintenance Work; Instrument Mechanics; Appliance Maintenance and Repairs; as well as Radio, Television and Electronic Work (NBTE, 2016; UNESCO, 2017). The trade provides learners with the practical skills and knowledge required for an electrical and electronics tradesperson employed in the manufacturing, mining, oil, and other industries.

The goal of the programme at the technical college level is to turn out graduates that will be enterprising and self-reliant, with skills in domestic and industrial installation, as well as having the ability to operate, maintain and repair electrical and electronic equipment, among others.

Studies, happenings, and opinion of experts show that electrical and electronic trade graduates do not have the full knowledge and experiences of what they claim to have studied, as most of them find it difficult to practicalise what they have learnt. Ogbuanya and Usoro (2009) noted that at graduation most of the students are deficient of employability skills, work place skills, and job generation competencies. Egwu (2017) also asserted that because good technicians are difficult to come by in Nigeria, expatriates working in the country bring in their manpower from abroad due to dearth of competent hands. The author further stated that the poor human resource situation is worse in the country, as it is difficult to get competent electricians, even at family level. Bakare (2017) even confirmed that most graduates often cause more damage to electronic gadgets contracted to them.

Apart from the matter of impotent electrical and electronic trade graduates, another unpleasant issue is the incessant poor achievement of students that have completed their modules, in the annual national examination conducted by the National Business and Technical Examination Board (NABTEB). The recent result released by the registrar and chief executive of NABTEB, (Aworanti, 2017), on Wednesday, August 29, 2012, show that only 23.4% of candidates passed the NABTEB examination held in May/June 2012 across the country. Also notable, is the fact that annual failure have been recorded in the electrical and electronic trades in the May/June NABTEB examinations, as revealed by NABTEB External Examiner Report (2010-2016) (Fakorede, 2016).

In a search for the cause of these twin challenge, researcher found that, Efuwape (2012) in a survey of electrical and electronic trade graduates and students reported that the two groups claimed not to have the full grasp of some of the things they learnt in school, because of difficulties in learning some abstract contents in the trade. Electrical and electronic trade teachers surveyed also confirmed that the trade contains some abstract basic contents, and that students find them difficult to understand as much as teachers also find them difficult to teach.

Supporting their claim, is the study of Ahmet and Ahmet (2011) which proves that in about 3,500 studies related to technology education in the last 20 years, it has been established that most students were unsuccessful in their understanding of abstract contents, with attendant negative effect on their achievement and response to novel challenges. He listed such abstract areas to include resonance, electromagnetism, and concept of active, reactive and apparent power.

Efuwape (2012) also noted that good understanding of abstract contents in the trade is essential, both for internalizing related concepts and to facilitate critical thinking when faced with challenges of providing a solution to workplace problems. Several reasons are attributed to the difficulties encountered in the teaching and learning of these abstract contents in electrical and electronic trades, such reasons include lack of resource based materials, incompetent teachers, inappropriate teaching tools, methodology used, among others (Alade, 2019). A study by Altun *et al.* (2017) also revealed that the reasons for not reaching the aims in lessons involving abstract scientific concepts like resonance in electrical circuits' was because of the traditional teaching approach employed. The study of Alevi *et al.* (2017) confirm the claims of electrical and electronic trade teachers, that they encounter difficulty in making students understand those abstract contents. Accusing fingers from other quarters have also been pointed to the traditional teaching approach used by electrical and electronic teachers in teaching those basic abstract contents. Among them are studies on traditional method of instruction such as Wenchieh and Hwang (2010), Takashi and Akbay (2017) which revealed the inability of the method to bridge the gap between abstract and reality of a course as experienced in teaching of some abstract topics in electrical and electronics trades.

The way teacher view the role of TV and radio in classroom teaching to a large extent determine the level and degree of its usage (Alade, 2019). Teacher forms an impression which is favourable or otherwise, depending on specific traits teacher attribute to electronic. Teacher perception on TV and radio is predicted upon what they feel that TV and radio can do in teaching-learning process (Zepp, 2015). Instructional strategies are the techniques or methods that a teacher can adopt to meet the various teaching learning objectives. These strategies help students to walk on the path of independent self centred learning and become strategic learners. Instructional strategies equip teachers and students to make learning interesting and help students to awaken their desire to learn. Instructional strategies focus not only on the educational contents but also on the methods and environments of the teaching process (Al-jarf, 2019).

Students' development level, interests and experiences are considered while choosing a particular teaching strategy in order to improve their academic performances and make learning permanent. Educators have become aware of the benefits and short-comings of various traditional methods used to provide instruction and training to students and practitioners (Feinstein, 2015). Over the years, many research studies have pointed out various external deterrents for the utilization of TV and radio. The major deterrents reported were budget 'difficulty in obtaining materials, lack of TV and radio classroom facilities and lack of trained audio-visual personnel (Moseley, 2014). Therefore this study needs to investigate teachers perception in the application of student center method in teaching and learning radio, TV and electronics work trade in Technical colleges in Niger State.

1.2 Statement of the Problem

It was observed that the academic performance of students in Radio and Television in Electronic work trade seems to be dwindling in recent years. This development may be

attributed to poor instructional strategy, inadequate and unprofessional teachers, and insufficiency of instructional materials. Electrical and electronic trade graduates do not have the full knowledge and experiences of what they claim to have studied, as most of them find it difficult to practicalise what they have learnt. Some cannot fix a fan, or even troubleshoot minor electrical faults, *let alone* possessing the competencies that will drive the nation's quest for technological relevance.

Incessant poor performance in NABTEB examinations, have also attested to the congruency of abstract contents mastery to improved learning outcomes. Again, NABTEB recorded high failure rate among the graduates of electrical and electronic trade in technical colleges in the examination held in May/June 2017. This is a crown on the failure recorded in previous years, as exemplified in NABTEB's External examiner Reports (NABTEB, 2017).

The above observation has been supported by other researchers like Uwaifo (2013) who buttressed that inadequacy of facilities both qualitatively and quantitatively has put the learners and the teachers at a disadvantage. The teacher may also have problem in a class with large students' population. The implication of this scenario is that only a small proportion of the students benefit from the current pedagogical system. There is dearth of multi-media facilities for the training of students in technical colleges in Niger State. The high cost of computer and teaching aids ownership is a major constraint to acquisition of the items. Access to affordable and reliable internet connectivity is only available in a few institutions, faculties and offices, even then, electrical power fluctuations have considerably reduced the reliability of the access and makes access difficult. Clarity and understanding Radio and Television Electronic trade still pose as a challenge because of its complexity and limited qualitative, adequate human and material resources. The traditional teaching approach has been attributed to the problem encountered in the effective teaching and learning of abstract contents in electrical and electronic trade. In order to facilitate students' understanding of

abstract concepts, in the quest to improve achievement, and also salvage the incessant production of ineffective electrical and electronic trade graduates, it is now imperative to investigate teachers perception in the application of student center method in teaching and learning radio, TV in electronics work trade in Technical Colleges in Niger State

1.3 Purpose of the Study

The aim of the study is to investigate teachers perception in the application of student center method in teaching and learning Radio, Television (RTV) in electronics work trade in Technical Colleges in Niger State. The specific objectives of the study is to investigate;

1. The attitude of teachers in the application of students center method in the teaching and learning RTV in electronics work trade.
2. The resources available for implementing students centre methods for teaching and learning RTV in electronics work trade.
3. Examine the extent students centred method are implemented in radio, television in technical colleges

1.4 Research Questions

The following research questions were raised to guide the study

1. What are the attitude of teachers in the application of student center method in the teaching and learning RTV in electronics work trade?
2. What are the resources available for implementing students centre methods for teaching and learning RTV in electronics work trade?
3. To what extent students centred method are implemented in radio, television in technical colleges?

1.5 Scope of the Study

The scope of the study is delimited to attitude, availability of resources, method of instruction and the extent students centred methods are implemented in teaching and learning RTV in electronics work trade in Technical Colleges in Niger State. The study covers only Technical colleges in Niger State. The study is limited between students and teachers of technical colleges in Niger State. The study exclude other higher institutions due to the fact that most of the institutions are not offering RTV course.

1.6 Significance of the Study

The findings of this study would be of immense benefit to policy makers, researchers, technical college students and teachers, ministry of education, industries and the society at large. The outcome of the study would be beneficial to the policy makers in planning and decision making in educational matters on electronic and electrical work trade. If contents are observed to be better taught with this method, then it will be mandated in the policy for implementation.

The researcher will also enlarge his knowledge and gather experience in the course of this study. Other stakeholders like the corporate organizations, and the nation in particular, will also benefit from this study, this is because well-equipped electrical and electronic trade graduates will contribute to organizations success and technological advancement of the nation.

The study will also be of great relevance to researchers in the world of academics in the sense that the findings generated from this study will contribute immensely to existing body of knowledge and also assist subsequent studies. It is expected that this study will be one of the references for other researchers to get information about teaching through student centre method.

The students who are the recipients of the training will also benefit from this study. It is expected that this study would overcome the difficulties of students' in internalizing abstract contents and consequently improve their performance. This will place value on them and their certificates; they will be confident and perform well at job interviews.

They will be well equipped, up to date, ready to face modern technological challenges that will make them self-reliant and successful in life.

The ministries at both federal and state levels are instrumental to policy formulation; the findings of this study might help the policy makers in making necessary reviews and further contribution in the policy formulation process. Officials in the ministry of education (e.g. inspector of schools) can also organize conferences, workshops and seminars so as to communicate to teachers the alternative methods of teaching abstract concepts in electrical and electronic trades.

1.7 Hypotheses

The hypotheses will be formulated and will be tested at 0.05 level of significance

H₀₁: There is no significant difference between the mean score of high experience teachers and low experience teachers on the attitude of teachers in the application of students center method in the teaching and learning RTV in electronics work trade.

H₀₂: There is no significant difference between the mean score of high experience teachers and low experience teachers on the resources available for implementing student centre methods for teaching and learning RTV in electronics work trade.

H₀₃: There is no significant difference between the mean score of high experience teachers and low experience teachers on the extent students centred method are implemented in radio, television in technical colleges.

CHAPTER TWO

2.0

LITERATURE REVIEW

2.1 Theoretical Framework

2.1.1 Ginzberg's Psychoanalytic theory

The study is coined on Ginzberg's Psychoanalytic theory of vocational development (Ginzberg, 1951). Ginzberg's Psychoanalytic theory of vocational development states that socio- economic values and personal attributes of a teacher will affect the teacher's career choice and development. This theory is very essential to this study in many ways. Factors such as; job satisfaction, instructional materials, school climate and teachers implementation and readiness which aids teachers to acquire the needed competences could as well affect teachers performance and development, thereby producing half baked students.

Advances in technology challenge teachers to constantly introduce and demonstrate new technologies to their students to better prepare them to enter the technologically advanced world of work. In order to meet industry needs, technical college teachers must continue to stay on the forefront of technology and pedagogy. To meet these demands, these teachers need in-service training opportunities from both educational institutions and industries. It is through in-service training that such teachers are able to expand their knowledge and improve their pedagogical skills so they are better able to serve their students and community in which they teach.

Teacher's competence at technical colleges is measured by the employability skills acquisition of the students. It could be argued that the best way to improve teacher quality is through in-service and training. The future of technological and indeed educational development of Nigeria or any nation depend on teachers since they instruct learners who are going to be the productive work force, leaders, followers and citizens of tomorrow (FRN,

2004). Teacher education is apparently most significant for the success of any country's educational goals. In as much as the quality of education depends to a large extent on the quality and number of teachers, the importance of teacher education cannot be over-emphasized. The quality and quantity of all other occupations/professions are greatly influenced by the calibre of teachers because no adequate and relevant education and training can occur without competent teachers to handle the programmes (Fafunwa, 2018).

2.1.2 Bruner's Theory on Constructivism

Jerome Bruner's 1966 theory on constructivism encompasses the idea of learning as an active process wherein those learning are able to form new ideas based on what their current knowledge is as well as their past knowledge. A cognitive structure is defined as the mental processes which offer the learner the ability to organize experiences and derive meaning from them. These cognitive structures allow the learner to push past the given information in constructing their new concepts. The learner, often a child, will take pieces of their past knowledge and experiences and organize them to make sense of what they know, then base further concepts and solve additional problems based upon a combination of what they already processed and what they think should be processed next.

The theory states that teacher resources used should be focused on that of encouragement, aiding and allowing the student to uncover the main principles on their own. The four major principles of Bruner's theory on constructivism encompass a predilection toward learning. The second, how a grouping of knowledge is able to be constructed to best be understood by the learner. The third is effective manners for the teacher to present said material to the learner, with the fourth and final aspect being the progression of rewards as well as punishments.

This theory encouraged the learner to be inquisitive, explorative, initiative, and innovative and to engage in self-discovery in the process of learning. This theory is related to this work

because the mind mapping instructional strategy focus on encouraging, aiding and allowing the student to uncover the main principles on their own. Mind mapping is based on the principle of discovery learning which Bruner's theory advocate.

2.2 Technical Colleges in Nigeria

Technical colleges are geared towards producing craftsmen in various disciplines. Their existence, as cited by Olaitan (2017), is to stimulate technological and industrial development by developing and utilizing technologies for industrial and economic advancement. Technical college is an integral part of the total educational system. It contributes towards the development of good citizenship by developing the physical, social, civic, cultural and economic competencies of the individual (Sanni, 2016). In technical colleges, students are trained to acquire relevant knowledge and skills in different occupations for employment in the world of work (NBTE, 2013).

According to Federal Ministry of Education (2014), a technical college is a segment of Technical and Vocational Education (TVE) designed to produce craftsmen at the secondary school level and master craftsmen in advanced craft. The goals of technical colleges, as stated by Federal Ministry of Education (2014) are, to provide trained manpower in the applied sciences, technology and business, particularly at craft, advanced craft and technician levels; provide the technical knowledge and vocational skills necessary for agricultural, commercial and economic development; and give training and impart the requisite skills to individuals who shall be self-reliant economically and in tune with latest technology.

Technical colleges are regarded as the principal vocational institutions in Nigeria. They give full vocational training intended to prepare students for entry into various occupations. Technical colleges train craftsmen in auto mechanics, plumbing, carpentry and joinery, cabinet

making, painting and decorating, welding, electrical installation, radio and TV repair, building construction and a few other areas. On completion of the course of training, students obtain work in industries or established business on their own.

According to NBTE (2001) the list of available programmes in technical colleges is presented below.

1. Automobile trade: these trades comprise of auto electric works, motor vehicle mechanics, vehicle body building, agricultural implement mechanics
2. Building and woodwork trades: these trades cover block laying, bricklaying & concreting, carpentry and joinery, draftsmanship craft practice, furniture design and construction, machine wood working, painting and decorating.
3. Business trades: consist of business studies, parts merchandising, typewriting, stenography
4. Computer trades: contain computer maintenance & GSM repairs, computer studies
5. Electrical/electronic trades: encompass appliances maintenance & repairs, electric installation and maintenance works, instrument mechanics, radio, television & electronic work
6. Hospitality trades: contain catering craft practice
7. Mechanical trades: embrace fabrication and welding, foundry craft, marine engineering, mechanical engineering craft practice, plumbing and pipe fitting, refrigeration and air condition work
8. Printing trades: are ceramic, graphic arts, and printing craft
9. Textile trades: comprise garment making, leather trades, textile trades

10. General education courses: include biology, chemistry, entrepreneurship education, ICT, mathematics, physics, economics, technical drawing.

The programmes in the college were designed to train craftsmen and artisans for the profiting of the individual and the economy. The success of technical and vocational education programme in making substantial contribution to the economy of a nation like Nigeria depends largely on the success of the process of imparting the required knowledge, attitude and skills to the students.

2.3 Radio, TV and Electronic Trades in Technical Colleges

Radio, TV and electronic trades are among the skilled areas studied in technical colleges. Radio, TV and electronic trade programme aim at producing craftsmen, technicians, and other skilled personnel who will be enterprising and self reliant with skills in domestic and industrial installation, as well as operate, maintain and repair radio, TV and electronic equipment, among others. The trade, as offered in the technical college, comprise of Electrical Installation and Maintenance Work; Instrument Mechanics; Appliance Maintenance and Repairs; as well as Radio, Television and Electronic Work (NBTE, 2013; UNESCO, 2015).

The trade provides learners with the practical skills and knowledge required for an electrical/electronic tradesperson employed in the manufacturing, oil, and other industries. The study encompasses contents that include electricity, electronics, electromagnetism, and communications, among others. Most of this content requires understanding of some abstract science content, which serves as the foundation upon which other contents are laid. The skills developed in this trade include fault finding, servicing, modification of machinery, and equipment maintenance.

The NTC and ANTC programmes are run by technical colleges accredited by NBTE. This is at craft and advanced craft level. For all craft programme, candidates must not be less than 14

years of age and should have successfully completed three years of junior secondary education of its equivalent. Special consideration may be given to sponsored candidates with lower academic qualifications who hold trade test certificates and are capable of benefitting from the programme. Advanced craft programme candidate should possess the national technical certificate or its equivalent and should have had a minimum of two years post qualification cognate experience.

As spelt out by NBTE (2011), the curriculum of each radio, TV and electronic trade programme is broadly divided into three components viz:

- a. General education, which account for 30% of the total hours required for the programme,
- b. Trade theory, trade practice and related studies which account for 65%, and
- c. Supervised industrial training/work experience, which account for about 5% of the total hours required for each programme. This component of the course, which may be taken in industry or in college production unit, is compulsory for all full time students.

All students who have successfully completed their modules will take a national examination conducted by NABTEB and awarded certificates.

2.4 Student Centred Methods (SCM)

Zhu and Engels (2013) claim that student centred method is the most important innovation on the micro level that can be placed beside the communication technologies and the use of collaborative learning approaches. The authors mention that innovations like SCM are most typical in organisations that have integrative structures, emphasize diversity and that also place an emphasis on collaboration and teamwork. The main characteristics of a student-centred approach are the considerations given to individual learners' experiences, perspectives, backgrounds, interests, capacities and needs (Harkema & Schout, 2018). Within this approach

teachers mainly focus upon what students should learn and emphasize why (Bransford *et al.*, 2013).

Teachers take into account the existing knowledge of students (Bransford, Brown, Cocking, 2014; Protheroe, 2017), provide different opportunities for students to learn, often change teaching methods, help students who have difficulties and consider their background. Teachers discuss with students which study activities lead to good results, expose students to looking for alternatives and trying to find their own solutions. Examination questions refer to real-life situation and do not lead to categorising students with regard to their scores or grades. The basic conditions for an effective learning situation are the learning environment in which learners feel safe and accepted; numerous opportunities for students to confront new information, experiences, and personal discovery of new understandings that are all adapted to the individual students and their pace of learning (Mc Combs *et al.*, 2017).

Harden and Laidlaw (2013) emphasise that teachers who work on the basis of the student-centred approach should provide feedback to the student, engage the student in active learning, individualise the learning to the personal needs of the student and make the learning relevant. They quote Hattie and Timperley (2017) that students should receive constructive and enough specific feedback, an explanation and that the language used in doing so should be non-evaluative, given in time and frequently and should help learners to plan further studies. Students have individual needs regarding personal capabilities, motivation and what drives their learning goals and career aspirations, achieving mastery of the course learning outcomes on entry to the course, learning styles and the place of learning – on campus or at a distance - and the time of learning. Individualisation can be achieved in many ways: The teaching programme may be arranged so that students can choose to attend a lecture on a subject, view a podcast of the lecture, engage in collaborative problem-based learning with their peers or work independently using an online learning programme.

Learning resources or learning opportunities can be adapted or prepared so that the students' learning experience, as they work through the programme, is personalised to their individual needs. When learning experiences are scheduled in the programme, such as a session with a simulator, the time allotted for an individual student is not fixed, but is the length of time necessary for the student to master the required skills. Also the curriculum can be designed so that it helps students' individual requirements e.g. by including experiences in the early year of the course, by encouraging a problem-based approach, by the use of virtual problems related to the subject (Harden and Laidlaw, 2013).

Mclean and Gibbs (2015) claim that the students should be included also at all levels of curriculum design, implementation and evaluation. As "clients", students need to be part of the process of developing a learner-centred curriculum. A clear admission policy (with appropriate support structures) should be developed. The school should support student diversity and individual learning needs, the psychological and social aspects of student diversity, develop students' self-learning skills, allow time for independent learning and pursuing areas of interest, regularly review the core curriculum content, recognise that their education continues beyond graduation, provide ample opportunity for student professional development and not pay lip service to learner-centredness.

Çubukçu (2014) lists a number of characteristics of the student-centred teaching programme, emphasising tasks that attract students' interests, organising content and activities around subjects that are meaningful to the students, determining clear opportunities that *let all* students develop their own learning, skills and progress to the next level of learning, organising activities that help students understand and improve their own viewpoints, developing global, interdisciplinary, and complementary activities, supporting challenging learning activities even if the learners find them difficult, and emphasising activities that encourage students to work with other students in cooperation.

In student-centred learning environments it is essential that students take responsibility for learning and that they are directly involved in the discovery of knowledge, choosing the materials used so that they offer them a chance to activate their background knowledge and ensuring that the planned activities are based on problem solving. Various institutions and outside-class activities are incorporated to support students' learning (Cubukcu, 2014). The time dimension should be evaluated in psychological terms. It is important that the students have enough time to construct the information cognitively and connect the new knowledge to real life. The students should have enough time for communication, for learning, synthesising, observing and applying new knowledge to social life, work, family and society. When talking about “location” of student-centred method we should include all the places where students learn: school, library, museums, work place and home.

Lemos *et al.* (2014) claim that the Bologna Process emphasises the importance of the student-centred approach. They point out that this system introduces students to the idea of taking responsibility for their learning activities, increased retention of the content, improved student engagement and improved status of the learners. Their study tried to investigate a new mixed-methods approach to evaluate the student centredness of teaching and learning. The research results showed that, in particular, teachers appreciated especially the following: the importance of engaging students in the learning process, that the class was a place for discussion, students were encouraged to be autonomous and that there was a shift in power relationships from teachers to students. Course objectives and assessment programme remained under teacher control. Teachers used content to capture student curiosity and increase motivation. Teachers considered themselves more as facilitators: they gave students high responsibility in classroom activities, and provided instant feedback.

European Students' Union (2018) is of the view that, the student-centred method is actually a synonym for quality higher education. Among other student-related issues they emphasise

transparent procedures for students to be able to give feedback on the quality of the educational process, students are consulted on curriculum content, on the teaching and evaluation methods used, are involved in periodic programme quality reviews, are involved as full and equal members in committees, procedures for students to appeal decisions regarding their academic attainment or progression are provided.

They are consulted when learning outcomes are designed, student needs and the diversity of the relevant student group are considered when designing learning outcomes, students are informed on the intended learning outcomes before they start a course or programme component, representatives of teachers and students are involved as full and equal members in the panels undertaking quality assurance reviews, institutional quality assurance reviews and guidelines take into account the overall elements of teaching and learning, prior learning (in non-formal learning environments) is recognised by the institution for the purpose of access into educational programmes, the process of recognition is easy, recognition of prior learning can be done without significant costs or bureaucracy, there are special support measures in place in order to help students from disadvantaged backgrounds, learning paths are flexible enough so as to permit combining work/family life and studies, group-work is used in the learning process.

The goals of the learning process are agreed upon between teachers and students, peer and self-assessment are used as a method in the student assessment process, projects are used in the assessment of students, simulations of tasks and real life situations are used in the assessment of students, students have access to appropriate research and study facilities, the institution contributes to promoting a national/regional culture of student-centred method, the programme uses a student-centred method approach in providing training on the use of innovative teaching methods and student-centred curriculum development.

Additionally, in the classroom, there is practical implementation of an SCM approach that includes a number of following components: problem-based learning, group project work, student-centred active learning, resource-based learning, use of the case method, role plays, classroom workshops, group presentations, use of a web-conferencing environment, particularly in distance education, small group work that enables students to learn how to work in a team, in the process of which they identify and fill the gaps in their knowledge. They also stress the importance of involving students after the task is completed, making self-assessment comments, making peer-assessment feedback comments, suggesting self-assessment grades and negotiating self-assessment grades.

2.5 Attitude of Teachers in the use of SCM

Student-centred method has been in use for a long time but its influence become stronger after it has been widely used. However, it does not seem that all the teachers and students are acquainted with student-centred method. They seem to know some terms like active participation in studies, they might know certain models like problem-based or project-based learning but not all the participants of education are aware that these elements belong to SCM.

Teachers have some troubles with student-centred method (Plush, 2014). At the beginning of their career, academics have very little experience, especially if they are employed more as experts than pedagogues. In many countries university lecturers have no formal teacher training, no examinations, and, consequently, no academic qualifications in the field – unlike teachers in other sectors. Very often, University teachers receive no training as regards the pedagogical approaches, teaching strategies, practical instructions, and the availability of learning technologies.

Besides being acquainted with pedagogical approaches, teaching strategies, university teachers should also believe in these approaches and especially in SCM. Jacobs *et al.* (2014) found the attitude of the teachers toward SCM so important that they even developed an instrument to measure concepts about learning and teaching in student-centred medical education (because several authors have noted that teachers' beliefs influence their teaching approaches).

Lea, *et al.* (2003) describe research which investigated the students' opinions and knowledge about student-centred method. Although the students who participated in the research claimed that they were unfamiliar with the term, they came up with various ideas about what student-centred approach might mean. Teachers expected that student-centred method activities would be active, interactive, contain group work, creative in nature, offer flexibility in the choice of modules, ensure continuous qualitative feedback, that students should have a say in learning outcomes, there should be respect for students, that students would be treated as adults and be given greater responsibility, that it would be an empowering process, more motivating and include constructive feedback. Students expected that their learning might be easier if they had a better timetable, more personal motivation, less anxiety before examinations, more guidance from teachers, if teachers were not so unapproachable, if there was more flexibility in module selection, more flexibility in relation to students' work, and improved access to resources etc. It seems that teachers as well as students would need further training in SCM. Teachers who are starting with their pedagogical career certainly need knowledge about the student-centred approach. But it would be necessary that all the teachers accepted the student-centred approach and believed in it because teachers' beliefs influence their teaching. On the other side students are even less acquainted with student-centred approach. It would be useful that also students learn some more about SCM and realize that they can expect from universities much more than they get at present.

2.6 Resources for application of SCM

Student-centred method is developed in a number of study programmes - very often in different areas of medicine, business, chemistry, physics, mathematics etc. With the Bologna system SCM entered in the majority of the university programmes and many of its elements are required by the quality reviews. The opinions about the global applicability of student-centred method are different. Some authors stress that student-centred method is a product of Western education systems and that Asian teachers and students have difficulties accepting, adopting and developing it. Medical education was among the first areas that tried to introduce the student-centred approach. Milanese *et al.* (2016) discuss the following learning situations in the field of clinical education (physiotherapy):

- The student demonstrates patient treatment and the educator facilitates the process
- the student observes another student during clinical practice
- the educator facilitates reflection after a demonstration
- the student completes a patient documentation form
- routine evaluation/treatment of the patient by the student (patient-centred activities)
- a one to one tutorial between educator and student
- the student participates in small group discussion on patient management
- the student is tutored by a fellow student
- the student presents a case study to fellow students and staff (discussion)
- the educator gives verbal feedback about clinical practice
- the educator gives written feedback about clinical practice
- the educator gives immediate feedback
- the educator gives feedback on what the student did well
- the educator gives feedback on the student's limitations

- the educator gives feedback on the student's knowledge
- the educator gives feedback on the student's skill
- the educator gives feedback on the student's attitude (feedback to the student)
- the student assesses him/her self on patient management
- the student is assessed by other students on patient management
- the student is assessed by the patient regarding patient care
- the educator assesses the student using a mock test situation
- the educator assesses the student at the end of the clinical placement (student assessment)
- the student performs role-play activities during clinical placement
- the educator and student plan learning activities for clinical placement together
- the student draws up a SWOT analysis of his/her learning abilities
- the student performs self reflection tasks on clinical abilities
- the student writes a report on patient management, the student makes a poster, evaluates an outcome measure, writes a case report on patient management, writes a report on evidence based physiotherapy on the value of patient statistics and completes a clinical folder for assessment.

The study found out that the most valuable activities for students were individual patient-centred learning activities with adequate discussion and immediate feedback that informed students about their limitations, skills, knowledge and attitude. The worst learning opportunities were those that were not directly related to patient-care. Nowadays researchers suggest that even the contemporary military higher education should introduce a student-centred approach. Rizescu *et al*, (2019) suggest that that also the military high schools should be based on quality assurance, curricular compatibility, competences and conformity with the

European labour market, optimal study conditions, materials, modern methods and equipment, student-centred systems, career counselling, student mobility etc.

To introduce a student-centred approach universities and colleges should encourage the students, the teachers and the institution as a whole to participate. Teachers in such student-centred learning environment should put emphasis on encouraging students' independent thinking, working on projects, solving practical problems, cooperating in research activities, learning new research methods, stimulating students' imagination, creativity and originality and on eliminating the lack of motivation. Students should be taught how to plan their learning, to interact with teachers, participate in research and assessment.

Teachers' guiding and monitoring should be based upon selection of materials and resources for study and upon the students' interests and capabilities. These are just two examples of two rather different areas of education: medical and military. SCM in the area of medical education has been known for a very long time while one would not expect that this democratic approach would be recommended also for military education. But the Bologna system of education requires many elements of the student-centred approach so we can expect that student-centred learning will slowly make its way to all the educational areas in the world.

According to Pham and Renshaw (2013) a number of Asian teachers showed reluctance to accept student-centred method therefore they tried to empower Asian teachers in adopting a student-centred approach. At first they had a one-day workshop that acquainted all the teachers with some basic skills to implement student-centred activities. They formed small groups, set tasks and expectations for student behaviours, clarified individual and group responsibilities, monitored both the process and outcomes of the group experience and advised on how teachers should perform their roles in student-centred method classes.

The teachers were also introduced to and instructed in the use of the main student-centred activities:

- Preparing short multiple-choice tests that aim to test the conceptual understanding of the students. The students were asked to work in small groups to complete the tests after each part of the lesson or at the end of each lesson.
- Questioning formulation strategy: Whenever the students worked on the readings they were required to work in small groups. Students helped each other to understand the readings not simply by summarising a set of facts given in the text but also by formulating a set of questions about the text.
- In-class questions: The teachers gave the class a rather general question and asked the students to discuss it with their group members before listening to the answers.
- The students discussed a recent relevant journal article that the teachers had sent to the students to read prior to class with a specific set of questions to answer.
- Case studies: The students read cases from the textbook and then discussed in groups the case using the questions provided.

2.7 Implementation of SCM for Teaching and Learning of Radio, TV in electronic trade

Implementation According to Houston (2016), is that optimum level of awareness, understanding and perfection which a graduate must have achieved in order to be rated as successful and effective. Proponents of Implementation Based Teacher Education (IBTE) promote it as a way to improve the correspondence between education/training and workplace requirements. It is individualized, emphasizes outcomes (what individuals know and can do), and allows flexible pathways for achieving the outcomes. It makes as clear as possible what is to be achieved and the standards for measuring achievement.

In theory, it overcomes the divide between hands and mind, theory and practice, general and vocational education. Abel (2015) described implementation-based-teacher-education as an attempt to document what is necessary to make competent teachers agree on goals and means to evaluate their successes in meeting these goals. Implementation, in this direction, focuses on the product of the teacher-training programmes and the behaviours demonstrated by the graduating pre- service teachers. It also parallels accountability by emphasizing specific behaviour outcomes of the programme and the importance of the evaluator actually being able to observe the necessary competence. According to him, Implementation-based technical teacher education is to identify the necessary competencies that contribute towards developing a teacher who will perform creditably as a professional teacher in his occupation. In this circumstance, the essential competencies are to be determined first in terms of the total curriculum, and later reduce to skill areas in the trades of that occupation.

Oranu (2015) opines that in any implementation- based technical teacher education programme, the teacher should be exposed to various skills involved in the systematic operations required in accomplishing a task. He emphasised that for this implementation to be achieved, the teacher should be trained using functional facilities, which should involve using real equipment, tools and materials by expert, for teaching these teachers. Advances in technology challenge teachers to constantly introduce and demonstrate new technologies to their students to better prepare them to enter the technologically advanced world of work.

In addition to possessing professional and other general affective competencies required of technical college teachers, technical college radio, television and electronic works teachers according to Ezugu (2014) possess unique implementation in various aspects of radio, television and electronic works. The goal of Radio Communication Technician is to enable the trainee appreciate the operation of common electronic devices and as well as acquiring practical skills in diagnosing of faults and repairs in radio communication (NABTEB, 2016).

Technical Training implementation in Radio Communication Technician includes the following:

- (a) Identify the various tools/instrument used in electronics
- (b) List the basic principles and characteristics of common electronic device including thermal devices;
- (c) Mention the applications and characteristics of common electronic devices;
- (d) Determine the rating of some common electronic components;
- (e) State the principles of construction and operation of power supply;
- (f) Describe the design of simple electronic circuits;
- (g) Identify various acoustic devices/equipment, their operation and repairs;
- (h) Explain the basic principles of radio transmission and reception;
- (i) Trace of faults and repair of radio receiver;
- (j) Mention the principles of amplifier and their operations

According to (NABTEB 2006), Radio communication Technicians maintenance, test and repair Includes;

- (a) Wiring or Cable networks
- (b) Consumer or business communication equipment

Specialized equipment such as intercoms, fax machines and computer networks

- (d) Toll and switching equipment

They may also involve:

- (a) Installing, terminating and testing copper and fibre optic conductors and cables.
- (b) Laying out and installing raceways framework.
- (c) Installing, commissioning, maintaining and troubleshooting communications equipment.
- (d) Using codes and standards to guide the installation of communication equipment.
- (e) Installing residential cable systems

(www.google/tvtechnicians/duties.com)

Duties and responsibilities can vary considerably from one position to another. Those primarily involved in servicing residential cable systems focus on trouble shooting problem when they arise. Here, ability to read blue print and trouble shoot electrical equipment is very important. Providing Technical College Teachers with those competencies will not only be useful in classroom situation, but also be useful in installation and maintenance of communication equipment's in the schools thereby reducing expenditure on sourcing for so-called experts to maintain such equipment.

2.8 Methods of Teaching use by teachers for SCM

Moore (2000) defined teaching as the action of a person imparting skills or knowledge or giving instruction. In the same vein, Clark and Star (2018) maintained that teaching is an attempt to assist students in acquiring or changing some skills, knowledge, idea, attitude or appreciation. Therefore, teaching involves the setting up of activities to enable somebody learn something which can improve the person's knowledge, skills, attitude and value. Thus, the aim of teaching is to facilitate learning. For teaching to facilitate learning, Akindolu (2017) emphasized that the content to be taught has to be worthwhile and the procedure has to be educationally acceptable for activity to be classified as teaching. Central to the process of teaching is the concept of effective teaching. Effective teaching depends on the teacher's use

of appropriate instructional materials and strategies (Cabrera & Nassa, 2018). In vocational and technical education, teaching methods and strategies are aimed at developing in the learners the ability to acquire the knowledge and skills useful for work. These methods and strategies can vary in depth and time depending on the level of students and the materials available for instruction. According to Nwachukwu (2016), the task of organizing for effective teaching is crucial in any educational setting. The crucial decision at all instructional levels of the organization will be centered on such factors as what to teach and how to teach it. These decisions are made by the teacher himself and a good insight and understanding of the decisions will assist the teacher greatly in developing a good plan for teaching. At the classroom level, Nwachukwu (2016) maintained that how to teach the selected elements depends on the teacher. Teaching methods are used by all teachers to present skills, knowledge and appreciations to the learners in the classroom and to engage learners in the tasks involved while teaching strategies are processes consciously adopted by the teacher to inject variety into teaching, stimulate and maintain the learners' interest in it (Ukoha & Enegwe, 2017). Instructional strategies are integrated in teaching methods as ancillaries or adjuncts to ensure the effectiveness of the method. Opinion of what should be a teaching method differs from author to author. A list of teaching methods given by one author is likely to agree in some respect and differ in other respects from another list given by another author. The difference in opinion may be because some authors give much prominence to a few methods while the other methods are given little emphasis or left out. Literatures in vocational and technical education reveal extensive listings of teaching methods as conceived and classified by various authors. However, lecture methods, project method (Okoro, 2014; Nwachukwu, 2016) and demonstration method are mostly used in implementing the curriculum in the technical colleges.

The success of a lesson depends on various factors apart from the method of teaching adopted. However the method and strategies used in teaching a lesson is of first-class importance (Ezeudu, 1995, as cited in Fakorede, 2016). The skillful teacher's choice of method include those listed below, or combination of methods, with strategies that most effectively assist him/her in achieving the lesson objectives.

Lecture Method

The lecture method involves a formal discourse or exposition in a subject matter to attain stated instructional objectives, the teacher does the talking while the learners listen and occasionally take notes (Ukoha & Eneogwe, 2015). According to Okoro (2014), in lecture method, teacher or some other knowledgeable person supplies information to the students. Ogwo and Oranu (2006) explained that lecture method is a teaching method whereby the teacher transmits information (subject matter, content) verbally to the students. Sometimes it involves writing on the chalkboard or using instructional materials. The students listen and take notes of facts that are considered important. Sometimes the students are allowed to ask questions for clarification.

Lecture method according to Ukoha and Eneogwe (2014) encouraged self-study and research. The learners also develop communication skills such as note-taking, listening and summary writing. However, Ukoha and Eneogwe noted that lecture method is further extension of the traditional view point that the teacher is an embodiment of knowledge. It is thus, the responsibility of the teacher to dish out or disseminate the knowledge to the learners who are supposedly ignorant and blank. They maintained that lecture method is one-way communication affair which is autocratic and encourage students passivity, rote learning and is inappropriate for encouraging student to think for themselves. Nwachukwu (2016) contend that good teaching always provides for a two- way communication between the teacher and

the students and for this reason other methods such as demonstration are more effective than the lecture method in many situations.

Okoro (2014) in his own point of view noted that the lecture method has only limited use in vocational and technical education. Adding that teachers should resist the temptation to give lengthening lecture since such lecture are usually dull and are incapable of stimulating and sustaining the interest of students. The lecture method, however, has its use in large classes, in advanced courses and when a lot of technical information has to be passed on to students.

Project Method

The project method is also one of the methods which are predominantly used in teaching in the technical colleges. The project method at the same time is one of the standard teaching methods in vocational and technical education. It is a means by which students develop independent and responsibility, and practice social democratic modes of behaviour (Ericson, 2015). Project method of teaching is suitable for large group, small group and individual instruction (Okoro, 2004; Ukoha & Eneogwe, 2014). The underlying principle of the method according to them is that learning takes place through direct contact with materials. A project method according to Nwachukwu (2016) implies a practical problem, which a student and the teacher plan to execute. The planning and the executing must be concrete in nature. It should involve the design, arrangement of materials, availability of equipment and tools and a good environment for the activity.

The construction of a project requires the student to apply the knowledge and skill he has learnt in the course. The teacher guides the students and provides assistance whenever it is required. In electricity, woodwork and metal work, construction of a project enable the students to make practical use of the equipment available in the workshop. It consolidates his knowledge of the

theoretical information and helps him develop practical skills. Project method allows for the individualization of instruction.

Demonstration Method

Demonstration method of instruction according to Nwachukwu (2016) is one the very effective methods applied by the teachers in achieving objective of learning in real-life situations. According to Ericson (2015), from the time vocational and technical education courses were introduced into the school system, the demonstration method has stood out as the most definite and valuable means for instruction. It continues to be so whenever it is desirable to have students learn exact and acceptable procedures in mechanical operations. Nwachukwu noted that a demonstration usually involves a process in which the learner follows a manner of planned and organized step. These steps help the method become a realistic and impressive one and also more a true learning experience where actual object, good models or apparatus are used.

Ericson (2015) noted that demonstration method as performed by the teacher is unfailing in developing and maintaining interest among students for the following reasons: There is an appeal to the sense of vision; skillful performance in hand manipulation always attracts attention; a desire to emulate work of the teacher; and students see immediate progress as a result of their effort.

Okoro (2014) pointed out that for demonstration to be effective, the teacher should plan for the demonstration; prepare students for the demonstration; carry out the demonstration properly; and review demonstration processes and restate the important points connected. Demonstrations are indispensable in vocational and technical education because students have to be taught the correct method for operating tools, equipment and machines. Demonstrations,

however, have the disadvantage that they are time consuming, and may require expensive equipment and materials.

Field Trips

Field trips enable students to study industrial processes first-hand and to see the relevance of laboratory and workshop practical. Field trip offers students opportunity to study industrial process and relate what they learn in the school with what actually obtained in the world of work. Learning provided by field trip is concrete and sensory. This is because students are provided with opportunity to see and observe things, places, people and process in real life setting. Nwachukwu (2016) explained that if it is not learning oriented it is not field trip. It is important to note that field trip should not be embarked upon unless there is a fully developed plan with a clear objective for the students. Further, after the field trip teachers should request the students to submit report of what they have learnt and this should be discussed in class. This actively makes the field trip learning experiences rather than mere site seeing.

2.9 Strategies for effective Implementation of SCM

Hocking (2019) mentions a number of studies (Lonka & Ahola, 2000; Hall & Sanders, 2011; Cannon & Newble, 2010; Honkimaki *et al.*, 2014) that have shown that student-centred method encourages deep learning that is associated with searching for meaning in the task and the integration of task aspects into a whole (Beusaert *et al.*, 2013). On the other side there are studies that explored how more student-centred teaching methods encouraged deeper student learning and self-regulated learning behaviours but found out that whilst the project motivated the students' participation in the classroom it did not prove that any deeper learning style had been achieved (Herington and Weaven, 2018).

Blackie *et al.* (2013) claim that student-centred method creates a link that can transform students and teachers. Student-centred teaching is not just a different style of teaching. This

approach requires that the teachers really understand and pay attention to the students and their learning (Blackie *et al*, 2013), that teachers use Rogers' optimistic view of the potential of any human being, to tend towards psychological health and maturity, that teachers should have congruence, unconditional positive regard and empathy and thus help to develop a deeply human relationship between student and teacher. This is similar to the findings of Barnett (2016) who concluded that the process of higher education should be more than increasing skills and knowledge, that there should be fundamental growth in the student. This idea is further developed by Sarah (2015) who emphasizes the student is a valued human being, that teachers should treat the students with respect and actively guide students in finding their own way of higher education. Mann, however, does not develop the idea about what a university could do to encourage teachers to practice this ideal.

Blackie *et al* (2013). suggest an academic staff development programme that will introduce the idea of student-centredness in higher education. Teachers and lecturers should work on increasing their own and their students' sense of value and self-esteem and begin to believe that it is possible to change (Blackie *et al.*, 2013).

Kember (2019) says that many university teachers consider that they are experts who should provide content-oriented teaching causing them to be reluctant to change their lectures to include active student engagement. According to Kember it is necessary to improve the quality of teaching and learning by encouraging teachers to adopt student- centred methods of teaching. Kember (2019) describes an initiative to promote student- centred teaching and learning. The campaign included an analysis of good practice by award-winning teachers, promoted wider use of good practice, a teacher training course which encouraged student-centred learning, projects etc.

2.10 Review of Related Empirical Studies

A very noteworthy study on the superiority of advanced organizers over the traditional method of instruction is that of Ezeh (2016). The study focused on the effect of advanced organizers on students' achievement, retention, and interest in Integrated Science. 365 JSS students in intact classes, were randomly drawn from five schools in Isi-ozo Local Government Area of Enugu State. This experimental research employed a 2 x 2 ANCOVA for data analysis. The result show that advanced organizer had significant effect on the pupils' mean post treatment and retention test score was not significant. The study focused on determining the effectiveness of advance organizers on student's achievement, retention and interest. An advance organizer is also a component of mind mapping which is being considered for this present study. In addition, since the study showed that students studying sciences taught with advanced organizers had greater gain in achievement score than those taught with traditional instruction it becomes pertinent to find out if mind mapping strategy adopted by the researcher will provide similar gain in achievement of electrical and electronic trade students in technical colleges.

In the same vein, Onyishi (2019) explored the effect of mind maps on students' interest and achievement in measures of central tendency in mathematics, the design used for the study was quasi experimental design, 350 JS1 students were selected from four purposively sampled schools. Two instruments were developed for the study while Mean, Standard deviation and Analysis of Covariance ANCOVA were used to answer the research questions and test the hypothesis. The result showed that mind map enhanced the achievement and interest of students in measures of central tendency. Result also showed that mind map teaching strategy could be used effectively in teaching both male and female students. Onyishi's study and the present study are based on the effect of mind maps on student achievement, though Onyishi's

study was conducted in the field of mathematics, the present study seek to find out what will be obtainable in electrical and electronic trades which is an entirely different field.

Keraro *et al.* (2017) conducted a research to investigate the effects of using cooperative concept mapping (CCM) teaching approach on secondary school students' motivation in Biology. A non-equivalent control group design under the quasi- experimental research was used in which a random sample of four co-educational schools was used. The study sample comprised of 156 second grade students in secondary cycle two students in Gucha district, control groups students were taught the same Biology contents but experimental group were taught using CCM approach, while control group were taught using regular teaching methods. Data were analyzed using the t-test, ANOVA and ANCOVA. The result shows that student exposed to the CCM approach have significantly higher motivation than those taught through regular method. The study is similar to the present study in that they both seek to determine the effect of mapping strategies, even though Keraro, Wachanga and Orora's study focus on the effect on student motivation while the present study is on the effect on student achievement.

Adesoji (2016) carried out a study to investigate the effect of problem-solving instructional strategy on the achievement of students' with different ability levels in chemistry. The performance of students in the high, medium and low ability levels in a problem-solving task were compared after exposing them to teacher-directed problem- solving instruction. The findings showed that there was no significant difference in the performance of students in different ability levels after the treatment. This shows that problem-solving strategies as a teaching innovations were effective in teaching students of different ability levels. This study is similar to the present study in that both of them seek to investigate the effect of instructional strategies on students' achievement. Nevertheless they differ in some aspects, Adesoji's study focus on students with different ability levels in chemistry while the present study seeks to determine achievement of mixed ability electrical and electronic trade students.

In another study, Nnamdi and Rose (2015) investigated on the effects of concept mapping and on the achievement in Biology among Nigerian secondary school students. The study involved one hundred and thirteen (113) senior secondary school students randomly selected from three mixed secondary school located in Delta State. The study utilized quasi-experimental design, pre-testing post-test treatment design. The results of the findings showed that the students exposed to concept mapping performed significantly better than those exposed to traditional methods of teaching. The study is related to the present study in the sense that they are both mapping strategies. However they differ in the sense that Nnamdi and Rose studied on students' achievement in Biology while the present study will elicit information on students' achievement in electrical and electronic trades.

Duyilemi and Olusa (2019) in their own study investigated the influence of gender and constructivist teaching strategy on student learning of Biology in secondary schools in Ondo State using the Achievement Test on selected Biology concepts (ATBC) and constructivists guide in Biology pollution. Data were analyzed using means scores and ANOVA as well as multiple classifications, hypothesis at 0.05 Alpha level. Finding shows that girls in the experimental group taught with constructivist strategy as an innovative teaching strategy performed higher in Biology. After treatment on school type, the girls in both mixed and single-sex school benefitted equally from constructivist strategy and therefore, recommended that teachers should be trained to use constructivist strategy in order to boost the performance of girls in Biology. The study is related to this study in that both studies seek to investigate the influence constructivist strategy and gender on achievement. However, the study was conducted using biology as the subject area but the present study seeks to use electrical and electronic trades as the subject area.

Egbuara (2017) also investigated the effect of the mode of organizer on students' achievement and retention. He used the verbal, graphic, and a combination of verbal graphic organizers. He

used pre-test, post-test two factorial (ANCOVA) design to test the hypothesis. The results indicated that the combination of both verbal and graphic organizers was the most facilitative in physics achievement and that maps can be effective for psychomotor as well as cognitive instructional objectives. The study at hand is also based on the combination of verbal and graphic organizers, and will also involve the use of pre-test post-test method of quasi experimental design.

David (2018) conducted a pilot study for students in a Nursing Program at John Hopkins University. Students were divided into two groups, one group using mind mapping and mind mapping templates for various subject areas, the other group continuing with their usual learning methods. The study concluded that mind maps enhanced learning significantly; positively impacted the learning experience; and produced a 12% increase in test scores. When the group that did not use mind mapping was later introduced to the mind mapping method, their achievements increased equally validating the results. This study is related to the present study in that the nursing field which is its focus is full of abstract contents that the present study also seek to address. However the two studies differ in the geographical and demographical characteristics. This success of mind mapping in medical education, which had a similar problem with teaching and learning of abstract, creates more optimism of likely success in learning abstract contents in electrical and electronic trades.

Oloruntoba (2016) conducted a study on effect of meta-learning instructional strategies on student achievement in metal work technology. The study employed Solomon four group experimental research design. Metal work achievement test was used as the instrument for the study. The observation classroom interactions carried out by the study were done with the aid of equivalent talk category system. Analysis on pre-test and post-test scores was done with SPSS computer package for computation of mean scores and two way analysis of variance for testing the hypothesis for the study. The study revealed that students taught with meta-learning

instructional strategies differed significantly in the quality of thinking shown during the instruction as compared with students taught with conventional teaching methods. It was found that students taught with meta-learning approach asked and responded to more questions than those taught with conventional method. In addition, the findings of the study also revealed that male students had slightly higher mean scores than the female students. The study is related to this present study in that they are both meta-learning strategies, and the two focused on technical subject areas.

Osafehinti (2018) in a study using 1,200 SS III students, which comprised 711 boys and 489 girls, aimed at finding out possible sex related differences in performance and attitude towards mathematics. The result revealed that girls had lower achievement in mathematics and show greater hatred for the subject than their male counterparts. The boys showed greater interest and performed better in mathematics. The study is related to the present study in that they both have gender as a common variable. However, Osafehinti's study was carried out in the field of mathematics while the present study is aimed at electrical and electronic trade students.

Particularly impressive is the finding from a study titled effectiveness of mind mapping in educational psychology, conducted by Bharambe (2012). Fourty M. Ed. Student- teachers were selected for the study and the Pre-test Post-tests Single Group Design' was used. The unit 'Growth and Development' was selected for teaching through mind mapping. The content test was prepared on the selected content and it was used as pre-test and post-test before and after teaching through mind mapping respectively. The data was collected through pre-test and post-test which is analyzed by using t-test. The results revealed that there is a significant difference between pre-test and post-test mean scores of M. Ed. Student teachers. Mind mapping was found effective in teaching Educational Psychology; it then becomes pertinent to find out if same will provide similar gain in the achievement of electrical and electronic trade

students in technical colleges. Bharambe's study and the present study are based on the effectiveness of mind mapping, but the two studies have different subject focus. In general, it appears that students who use mind mapping seem to make greater gains than students who do not use mind mapping. However, despite the significant results recorded in other subjects, there is no record of any work done on mind mapping using electrical and electronic trade or any of the technical education courses as a content focus. Thus, the researcher want to find out the effect of mind mapping on the achievement of electrical and electronic trades students in technical colleges in Ogun State.

2.11 Summary of Literature Review

The literature reviewed by the study was in the following areas: Conceptual Framework; Theoretical Framework; and Related Empirical Studies. The conceptual framework guided the researcher in obtaining a framework of activities discussed in the study; it examined the overview of technical college education in Nigeria, Electrical and electronic trade programme in technical colleges, and methods and strategies used in teaching Electrical and electronic trades in technical colleges. The conceptual framework also discussed need for a change in methodology, as well as academic achievement in technical education. From the literature reviewed, the student centred method could be as a unique educational strategy that facilitates critical thinking, internalization of abstract contents, and knowledge retention. It has been reported to be a potent tool for promoting meaningful learning. It has been adopted by several researchers who have employed it at all levels in different disciplines.

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1 Research Design

The study adopted descriptive survey design in which questionnaire was used to obtain the opinion of the respondents that are teachers. The survey research design was chosen as an appropriate method for the researcher as it seeks the opinion of respondents about the issue that affect their daily life. Descriptive survey research is an approach of descriptive research that blends quantitative and qualitative data to provide you with relevant and accurate information. The descriptive survey design engages the people at the centre of the research objectives.

3.2 Area of Study

The study was carried out in Technical College in Niger State. Niger State is located on the North-Central Geo Political Zone of Nigeria and is one of the major economics hubs in the North-Central Zone and in the country at large. The area posses all necessary facilities like workshop, conductive classroom and personnel needed for carrying out the research.

3.3 Population of the study

The total population for this study comprise of one thousand two hundred and thirty eight (1238) students and thirty three (33) teachers in Technical colleges in Niger State. The target population of the study is one hundred and twenty (120) respondents.

3.4 Sample and Sampling Technique

A simple random sampling technique was used to sample hundred (100) students and twenty (20) teachers from five technical college in Niger State.

Table 3.1: Sampled Distribution

S/N	Technical Colleges	Students	Teachers
1	Government Technical college, Minna	20	4
2	Government Technical college, Eyagi Bida	20	4

3	Federal Science and Technical college, Shiroro	20	4
4	Government Technical college, Kontagora	20	4
5	Government Technical college, New Bussa	20	4
	Total	100	20

3.5 Instrument for Data Collection

Questionnaire was used by the researcher for the data collection of this study. The research questions comprise of two parts and three sections, which part one is personal data of the respondents and part two with three sections deals with research questions.

Section A has ten (10) items on the teachers attitudes in the application of student center method in teaching and learning of radio, television in electronics work trade in technical colleges in Niger State.

Section B has ten items on the resources available for implementation of student center method in teaching and learning of radio, television in electronics work trade in technical colleges in Niger State.

Section C has eleven (11) items on the extent students center methods are implemented in teaching and learning of radio, television in electronics work trade in technical colleges in Niger State.

3.6 Validation of the Instrument

The instrument was validated by three lecturers in the Department of Industrial and Technology Education, Federal University of Technology Minna. The validator suggestions and correction made by the validators was incorporated in the final draft of the instrument. This is to ensure that the instrument is capable of elicit necessary information for the data needed for the study.

3.7 Reliability of Instrument

The Cronbach Alpha coefficient was used to determine the internal consistency of the instruments. It was obtained by administering the questionnaire to teachers of Orozo Technical College Nyanya, Abuja, which is outside the study area but have similar features to the study area. Nworgu (2005) assertion that reliability concerns the consistency with which an instruments measures whatever it supposes to measure.

3.8 Administration of the Instrument

The questionnaires for the study was administered to the teachers and students. By the researcher and four (4) research assistants, the respondents able to read and tick in the column of their options.

3.9 Method of Data Analysis

The data collected was analysed using mean, standard deviation and t-test. The statistical tools that was employed for the analysis include mean, standard deviation and t-test. Mean was used to answer the research questions while standard deviation and t-test was employed to analyse the hypotheses. In order to determine the level of acceptance of the rejection of any item, a mean score of 2.50 will be use. Therefore, any item with a mean response of 2.50 and above was accepted and any item with a mean response of 2.49 and below was rejected. The t-test was employed to test the hypotheses at 0.05 level of significance, to compare the mean response of the road side panel beater and metalwork teachers. Each t-value calculated that is less than the critical value at 0.05level of significance was accepted while t-value that is equal to or more than critical value was rejected.

CHAPTER FOUR

4.0

RESULTS AND DISCUSSION

4.1 Results

4.1.1. Research Question One

What are the attitude of teachers in the application of student center method in the teaching and learning radio, TV and electronics work trade in Technical colleges in Niger State?

Analysis of research question one is presented in Table 4.1.

Table 4.1: Mean and standard deviation of respondents on the attitude of teachers in the application of student center method in the teaching and learning radio, TV and electronics work trade in Technical Colleges

S/N	ITEMS	\bar{X}_1 n ₁ =100	\bar{X}_2 n ₂ =20	\bar{X}_T N=120	SD	Decision
1	Teachers expected that student-centred method activities would be active	2.70	2.49	2.60	0.56	Agreed
2	Teachers expected that student-centred method activities would be interactive	2.88	2.98	2.93	0.57	Agreed
3	Teachers perceive that student-centred method activities would be contain group work	2.97	2.02	2.50	0.62	Agreed
4	student-centred method activities is creative in nature	2.87	2.92	2.90	0.69	Agreed
5	It offer flexibility in the choice of modules	2.40	2.60	2.50	0.69	Agreed
6	Teachers perceive that SCM ensure continuous qualitative feedback	2.52	2.62	2.57	0.68	Agreed
7	Teachers perceive that students should have a say in learning outcomes	2.94	2.70	2.82	0.63	Agreed
8	There should be respect for students	2.50	2.54	2.52	0.64	Agreed
9	SCM students would be treated as adults and be given greater responsibility.	2.51	2.80	2.66	0.64	Agreed
10	SCM is an empowering process, more motivating and include constructive feedback	2.60	2.67	2.64	0.51	Agreed

Key: \bar{X}_1 = Mean response of low experience teachers, \bar{X}_2 = Mean response of high experience teachers, n₁ = No of low experience teacher, n₂ = No of teachers, \bar{X}_T = Average mean response

Table 4.1 shows the responses of respondents on the attitude of teachers in the application of student center method in the teaching and learning radio, TV and electronics work trade in Technical colleges. The result revealed that items 1-10 agreed with the mean range from 2.50-2.60 on the attitude of teachers in the application of student center method in the teaching and learning radio, TV and electronics work trade in Technical colleges based on the decision. The result also revealed that the standard deviations (SD) of all items are within the ranges from 0.51 to 0.69, each of these values was less than 1.96 which indicated that respondents were not too far from the mean and from one another in their responses on the attitude of teachers in the application of student center method in the teaching and learning radio, TV and electronics work trade in Technical colleges. This indicated most of the respondents agreed that teachers have positive attitude towards the application of student center method in the teaching and learning radio, TV and electronics work trade in Technical colleges.

4.1.2 Research Question Two

What are the resources available for implementing students centre methods for teaching and learning RTV in electronics work trade?

Analysis of research question one is presented in Table 4.2.

Table 4.2: Mean and standard deviation of respondents on the resources available for implementing students centre methods for teaching and learning RTV in electronics work trade

S/N	ITEMS	\bar{X}_1 n ₁ =100	\bar{X}_2 n ₂ =20	\bar{X}_T N=120	SD	Decision
1	Internet services	2.60	2.67	2.64	0.51	Available
2	Computers	2.60	2.81	2.71	0.78	Available
3	Projectors	2.72	2.40	2.56	0.78	Available
4	e-library	2.94	2.25	2.60	0.63	Available
5	Interactive board	2.39	2.72	2.56	0.68	Available

6	Consistent power supply	2.62	2.65	2.64	0.60	Available
7	Equipped workshop	2.62	2.55	2.59	0.66	Available
8	Available safety rules during RTV practical class	2.65	2.56	2.61	0.56	Available
9	Radio and Television	2.62	2.55	2.59	0.78	Available
10	Visual aid	2.65	2.45	2.55	0.51	Available

Key: \bar{X}_1 = Mean response of low experience teachers, \bar{X}_2 = Mean response of high experience teachers, n_1 = No of low experience teacher, n_2 = No of teachers, \bar{X}_T = Average mean response

Table 4.2 shows the responses of respondents on the resources available for implementing students centre methods for teaching and learning RTV in electronics work trade. The result revealed that items 1-10 agreed with the mean range from 2.56-2.71 on the resources available for implementing students centre methods for teaching and learning RTV in electronics work trade based on the decision. The result also revealed that the standard deviations (SD) of all items are within the ranges from 0.51 to 0.69, each of these values was less than 1.96 which indicated that respondents were not too far from the mean and from one another in their responses on the resources available for implementing students centre methods for teaching and learning RTV in electronics work trade. The result indicates that most of the respondents agreed that those are the resources needed for implementing students centre methods for teaching and learning RTV in electronics work trade.

4.1.3 Research Question Three

To what extent students centred method are implemented in radio, television in technical colleges?

Analysis of research question three is presented in Table 4.3.

Table 4.3: Mean and standard deviation of respondents on the extent students centred method are implemented in radio, television in technical colleges

S/N	ITEMS	\bar{X}_1 n ₁ =100	\bar{X}_2 n ₂ =20	\bar{X}_T N=120	SD	Decision
1	I rarely arrange the students into groups for team work.	2.96	2.22	2.59	0.55	High Extent
2	I encourage students to ask questions.	2.98	2.42	2.70	0.57	High Extent
3	I discourage the students to explore their current beliefs	2.87	2.52	2.70	0.54	High Extent
4	I often confront the students with problem to solve.	2.98	2.33	2.66	0.65	High Extent
5	I encourage students to deduce general principles from practical experiences.	2.61	2.42	2.52	0.61	High Extent
6	I consciously create conditions to stimulate students need to Know.	2.51	2.52	2.52	0.60	High Extent
7	I discuss worksheet results with students.	2.52	2.64	2.58	0.63	High Extent
8	I think cooperative work in groups is good for efficient learning.	2.84	2.74	2.79	0.64	High Extent
9	I frequently ask open-ended questions	2.65	2.75	2.70	0.64	High Extent
10	I praise students works as often as possible	2.62	2.54	2.58	0.39	High Extent
11	I help students to take responsibility for their own learning	2.96	2.22	2.59	0.69	High Extent

Key: \bar{X}_1 = Mean response of low experience teachers, \bar{X}_2 = Mean response of high experience teachers, n₁ = No of low experience teacher, n₂ = No of teachers, \bar{X}_T = Average mean response

Table 4.3 shows the responses of respondents on the extent students centred method are implemented in radio, television in technical colleges. The result revealed that items 1-11 agreed with the mean range from 2.52-2.70 on the extent students centred method are implemented in radio, television in technical colleges based on the decision. The result also revealed that the standard deviations (SD) of all items are within the ranges from 0.51 to

0.69, each of these values was less than 1.96 which indicated that respondents were not too far from the mean and from one another in their responses on extent students centred method are implemented in radio, television in technical colleges. The result indicates that most of the respondents agreed that these are the needed teachers competencies.

4.2 Testing of Hypotheses

Hypothesis One: There is no significance difference between the mean score of high experience teachers and low experience teachers on the attitude of teachers in the application of students center method in the teaching and learning RTV in electronics work trade.

Analysis of hypothesis one is presented in Table 4.4.

Table 4.4: t-test analysis on the attitude of teachers in the application of students center method in the teaching and learning RTV in electronics work trade

Variables	N	Mean	SD	T	p-value
Low experience teachers	100	2.55	0.70	0.77	0.52
High experience teachers	20	2.59	0.73		

Table 4.4 shows the comparison of t-test of the mean rating of the responses of the respondents on the attitude of teachers in the application of students center method in the teaching and learning RTV in electronics work trade. The results revealed that the mean and standard deviation of Low experience teachers are 2.55 and 0.70 while the mean and standard deviation of High experience teachers are 2.59 and 0.73 respectively. Since the p-value (0.52) is greater than 0.05, the result revealed that there is no significance difference between the mean score of high experience teachers and low experience teachers on the attitude of teachers in the application of students center method in the teaching and learning RTV in electronics work trade.. Therefore, the null hypothesis was accepted.

Hypothesis Two

There is no significance difference between the mean score of high experience teachers and low experience teachers on the resources available for implementing student centre methods for teaching and learning RTV in electronics work trade.

Analysis of hypothesis two is presented in Table 4.5.

Table 4.5: t-test analysis on the resources available for implementing student centre methods for teaching and learning RTV in electronics work trade

Variables	N	Mean	SD	Z	p-value
Low experience teachers	100	2.71	0.75	0.83	0.69
High experience teachers	20	2.59	0.68		

Table 4.5 shows the comparison of t-test of the mean rating of the responses of the respondents on the resources available for implementing student centre methods for teaching and learning RTV in electronics work trade. The results revealed that the mean and standard deviation of low experience teachers are 2.71 and 0.75 while the mean and standard deviation of high experience teachers are 2.59 and 0.68 respectively. Since the p-value (0.69) is greater than 0.05, hence there is no significance difference between the mean score of high experience teachers and low experience teachers on the resources available for implementing student centre methods for teaching and learning RTV in electronics work trade. Therefore, the null hypothesis was accepted.

Hypothesis Three

There is no significance difference between the mean score of high experience teachers and low experience teachers on the extent students centred method are implemented in radio, television in technical colleges.

Analysis of hypothesis three is presented in Table 4.6.

Table 4.6: t-test analysis on the extent students-center method are implemented in radio, television in technical colleges

Variables	N	Mean	SD	T	p-value
Low experience teachers	100	2.53	0.68	0.24	0.61
High experience teachers	20	2.63	0.54		

Table 4.6 shows the comparison of t-test of the mean rating of the responses of low experience teachers and high experience teachers on the competencies required by teachers in the teaching and learning of RTV in electronics work trade in the application of student center method in radio, TV and electronics work trade. The results revealed that the mean and standard deviation of trainer are 2.53 and 0.68 while the mean and standard of trainee are 2.63 and 0.54 respectively. Since p-value (0.61) is greater than a value (0.05), the result shows that There was no significance difference between the mean score of high experience teachers and low experience teachers on the competencies required by teachers in the teaching and learning of RTV in electronics work trade in the application of student center method in radio, TV and electronics work trade. Therefore, the null hypothesis was accepted.

4.3 Summary of Findings

1. Teachers shows attitude towards the application of students-center method in the teaching and learning radio, TV and electronics work trade in Technical colleges.
2. The result revealed the resources needed for implementing students-center method for teaching and learning RTV and electronics work trade among them are computers, projectors, e-library, Interactive board and Consistent power supply.
3. Teachers possess the required implementation of students-center method for effective teaching and learning of radio, TV and electronics work trade.

4. There was no significant difference between the mean score of high experience teachers and low experience teachers on the attitude of teachers in the application of students-center method in the teaching and learning RTV and electronics work trade.
5. There was no significant difference between the mean score of high experience teachers and low experience teachers on the resources available for implementing students-center method for teaching and learning RTV and electronics work trade.
6. There was no significant difference between the mean score of high experience teachers and low experience teachers on the extent students-center method are implemented in radio, television in technical colleges.

4.4 Discussion of Result

The findings on research question one that deals with the attitude of teachers in the application of students-center method for teaching and learning radio, TV and electronics work trade in Technical colleges in Niger State. The result revealed that teachers have positive attitude towards the application of students-center method in the teaching and learning radio, TV and electronics work trade in Technical colleges. The findings is inline with Jacobs *et al.* (2014) they found the attitude of the teachers toward SCM so important that they even developed an instrument to measure concepts about learning and teaching in student-centred medical education because several authors have noted that teachers' beliefs influence their teaching approaches. Also Plush (2014) stated that teachers shows attitude at the beginning of their career, academics have very little experience, especially if they are employed more as experts than pedagogues

The findings on research question two that deals with the resources available for implementing students centre methods for teaching and learning RTV in electronics work trade. The result revealed that among the resources needed for implementing students centre methods for teaching and learning RTV in electronics work trade are computers, projectors, e-library,

Interactive board and Consistent power supply. The findings corroborate with the Elvin (2016) who reported that Teachers' guiding and monitoring SCM should be based upon selection of materials and resources for study and upon the students' interests and capabilities. In another study by Rizkar *et al.* (2017) the study found out that the most valuable activities for students were individual resources for learning activities with adequate discussion and immediate feedback that informed students about their limitations, skills, knowledge and attitude.

The findings on research question three that deals with the extent students centred method are implemented in radio, television in technical colleges. The result revealed that teachers have the required competencies in teaching and learning of radio, TV and electronics work trade in the application of student center method in radio, TV and electronics work trade. According to Houston (2016), define competencies as that optimum level of awareness, understanding and perfection which a graduate must have achieved in order to be rated as successful and effective. Also Oranu (2015) opines that in any implementation- based technical teacher education programme, the teacher should be exposed to various skills involved in the systematic operations required in accomplishing a task. He emphasised that for this implementation to be achieved, the teacher should be trained using functional facilities, which should involve using real equipment, tools and materials by expert, for teaching these teachers.

CHAPTER FIVE

5.0 CONCLUSION AND RECOMMENDATIONS

5.1 Summary

The study investigate teachers perception in the application of students-center method for teaching and learning Radio, Television (RTV) and electronics work trade in Technical Colleges in Niger State. The objectives of the study are the attitude of teachers in the application of students center method in the teaching and learning RTV and electronics work trade, the resources available for implementing students centre methods for teaching and learning RTV and electronics work trade and examine the extent students centred method are implemented in radio, television in technical colleges. The study found that teachers possess the required implementation of student centred method for effective teaching and learning of radio, TV and electronics work trade.

5.2 Implication of the Study

The study implies that there are resources needed for implementing students centre methods for teaching and learning RTV and electronics work trade among them are computers, projectors, e-library, Interactive board and Consistent power supply.

5.3 Contribution to Knowledge

The study contribute to knowledge by establishing a positive attitude of teachers in the application of students center method for teaching and learning RTV and electronics work trade. It also established that resources are available for implementing students centre methods for teaching and learning RTV in electronics work trade

5.4 Conclusion

The study investigate teachers perception in the application of student center method in teaching and learning Radio, Television (RTV) and electronics work trade in Technical Colleges in Niger State. Three objectives, research questions and hypotheses were formulated and raised to guide the study. The study revealed that teachers shows attitude towards the

application of student center method in the teaching and learning radio, TV and electronics work trade in Technical colleges. It was also revealed that teachers need the required competencies in teaching and learning of radio, TV and electronics work trade in the application of student center method in radio, TV and electronics work trade. The study conclude that student centre method is the most important innovation on the micro level that can be placed beside the communication technologies and the use of collaborative learning approaches, innovations like SCM are most typical in organisations that have integrative structures, emphasize diversity and that also place an emphasis on collaboration and teamwork. This will help the teacher to mainly focus upon what students should learn and emphasize.

5.5 Recommendations

Based on the findings, the following recommendations are made:

1. The Teachers of RTV should show positive attitude towards the implementation of student centre method so as to stimulate and motivate the students
2. The school administrators and government should provide adequate and efficient resources for effective implementation of SCM.
3. The government should also provide funds to empower the schools for consistent power supply because without electricity implementation of SCM will be difficult
4. The teachers should be trained and retrained on high capacity level so as to build confidence when teaching the students.
5. The schools should organize workshop and seminars for teachers and students

5.6 Suggestion for Further Studies

1. Design, user ability, and acceptability of free open source software (FOSS) in teaching and learning of electronics in tertiary institutions in Niger State.

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2. The effect of concept mapping on students achievement, interest and retention in electrical/electronics in North Central.

REFERENCES

- Abel, D. (2015) Educational achievement and mind mapping. Retrieved from www.wordpress.com
- Adesoji, F. A. (2016). Average student and effectiveness of problem-solving instructional strategies. *Ife Journal of Educational Studies*, 4(1), 16-19.
- Ahmet, H. K & Ahmet J. O. (2011). Influence of sex difference of students on their achievement in secondary school mathematics. *ABACUS: Journal of the Mathematics association of Nigeria*, 25(1), 109-113.
- Akindolu, R. (2017). Dictionary of guidance and counseling psychology. Ibadan: Olu- Akin Publishers.
- Akindolu, R. (2017). *Dictionary of guidance and counseling psychology*. Ibadan: Olu- Akin
- Alade, I.A. (2019). *Administration and curriculum development of vocational/technical education in Nigeria*. Ibadan: Higher Ground Publisher.
- Alade, I.A. (2019). Administration and curriculum development of vocational/technical education in Nigeria. Ibadan: Higher Ground Publisher.
- Alevi, N. (2017). An exploration of teachers' contemporary educational technology. Retrieved from www.cedtech.net/articles/31/313.pdf
- Altun, T., Yigit, N., & Alevi, N. (2017). An exploration of teachers' contemporary educational technology. Retrieved from www.cedtech.net/articles/31/313.pdf
- Aworanti, O. (2017). 33,614 candidates passes NABTEB examination. Retrieved from www.nigeraniversitynews.com/33614-candidates-passes-nabteb-examination.html
- Bakare, J.A. (2017). Skill improvement needs of electrical and electronic trade graduates in technical colleges. *A paper presented at the biennial conference of the national Association of Teachers of technology (NAAT)*. Benue state university.
- Bamett, E. (2016). Teaching with the brain in mind. ASCD-Association for supervision and curriculum development. Virginia: Alexandria.
- Beausaert, N Houser, M., Bainbridge, & Frymier, A. (2019) The Role of Student Characteristics and Teacher Behaviors in Students' Learner Empowerment, *Communication Education*, 58 (1), pp. 35.
- Bharambe, I. (2012). Effectiveness of mind mapping in educational psychology. *Indian streams Research Journal (ISRJ)*, 2(4) 10-18.
- Blackie, S., Jocz, J.A., Zhai, J., Tan, A.L. (2013) Inquiry Learning in the Singaporean Context: Factors affecting student interest in school science, *International Journal of Science Education*, vol. 36 (15), pp. 2596-2618.
- Bransord, A. A., Alevi, K. & Mji, A. (2014). Is gender a factor in mathematic performance among Nigeria pre-service teachers? *Sex Role*, 51(11 & 12), 749-753.
- Cabrera, M. J., & Nassa, K. M. (2018) Cognition and Student-centered, Web-based Learning: Issues and Implications for Research and Theory Available at: http://link.springer.com/chapter/10.1007/978-1-9-1551-1_2# [Accessed 20 January, 2015].

- Cannon, A. & Newble, U (2010) Computer-aided Mathematics Instruction with Mathematica 3.0. *Mathematica in Education and Research*, 6 (4), pp. 37-40.
- Clark.T.E., & Star, Z. M (2018) Improving student learning using the personalised system of instruction, *Higher education*,35, pp. 187-203.
- Cubukcu, G. (2014). Applications of the mind map learning technique in chiropractic education. *The Journal of Chiropractic Education*, 19, 53-54.
- David, R.H. (2018). Medical Student Research Day-johns Hopkins Medicine. Retrieved from www.hopkinsmedicine.org/som/.../MSRD_2012_abstract_booklet.pdf,
- Duyilemi, A.N.,&Olusa, O. L. (2019).Gender and constructivist strategy in students learning of biology at senior secondary level. *Journal of Science and Technical Education*, 1(1), 56-62.
- Efuwape, B.M. (2012). Design, user ability, and acceptability of free open source software (FOSS) in teaching and learning of electronics in tertiary institutions in Ogun state (*Unpublished doctoral thesis*). University of Ibadan, Nigeria.
- Egbuara, A. A. (2017). Effect of mode of organizer on student achievement in science education(Unpublished master's thesis).Department of Science Education, University of Nigeria, Nsukka.
- Egwu, S. (2017). Road map or Nigerian education system. Vanguard
- Elvin R. (2006). Enhancing freshman students writing skills with a mind mapping software. *Paper presented at the 5th International Scientific Conference, e-Learning and software for education*. 7(2) 81-84. Bucharest
- Ericson, R. (2015). Teaching in the industrial arts. USA: Bennett Press.
- Ezeh, T. C. (2016). Effect of advanced organizers on students' achievement, retention and interest in integrated science (Unpublished master's thesis).Department of Science Education, University of Nigeria, Nsukka.
- Ezeudu, F. O. (1995). The effect of concept mapping on students achievement, interest and retention in basic studies. Unpublished Ph. D Thesis Faculty of Education, University of Nigeria, Nsukka
- Ezugu, R. (2014). Mind mapping: A graphic organizer for the pedagogical toolbox. *Science Scope*, 25 (8), 20-24.
- Fafunwa, P. A. (2018). Heritability of frontal brain function related to action monitoring. *Psychophysiology*,45 (4),524–534.
- Fakorede, S.A. (2016). Effect of mapping strategies and learning modes on the psychomotor achievement of automobile technology students in Lagos state technical colleges (Unpublished doctoral thesis).Vocational Teacher Education Department, University of Nigeria, Nsukka.
- Federal Ministry of Education.(2004). National Policy on Education. Lagos: NERDC.
- Feinstein, N. (2015). *An exploration of teachers' contemporary educational technology*. Retrieved from www.cedtech.net/articles/31/313.pdf

- FRN, R. (2004). Enhancing freshman students' writing skills with a mind mapping software. Paper presented at the 5th International Scientific Conference, e- Learning and Software for Education. Bucharest.
- Ginzberg, A. (1951). *Conducting research in education and the social sciences*. Enugu: Tian Ventures
- Hall, A. & Sanders, M (2011) *Cognitive Fundamentals of Multimedial Information Systems, Multimedia Basics, Volume 2: Learning*, New Delhi, Laxmi Publications.
- Harden, R.M., Laidlaw, J.M. (2013) Be fair to students: four principles that lead to more effective learning, *Medical teacher*, vol. 35, pp. 27–31.
- Harkema, S.J.M., Schout, H. (2018) Incorporating Student-Centred Learning in Innovation and Entrepreneurship Education, *European Journal of Education*, vol. 43 (4), pp. 513-526.
- Hattie, J., Timperley, H. (2017) The Power of Feedback, *Review of Educational Research*, vol. 77 (1), pp. 81-112.
- Herington, C., Weaven, S. (2018) Action Research and Reflection on Student Approaches to Learning in Large First Year University Classes, *The Australian Educational Researcher*, vol. 35 (3), pp. 111-134.
- Herington, T. & Weaven, M. (2018). UCU study skills online-mind mapping. Retrieved from <http://www.map/netshare/lear/mindmap/index/html>
- Hockings, C. (2019) Reaching the students that studentcentred learning cannot reach. *British Educational Research Journal*, 35 (1) pp. 83–98.
- Honkimaki, S., Tynjala, P. & Valkonen, S. (2014) University students' study orientations, learning experiences and study success in innovative courses, *Studies in Higher Education*, vol. 29 (4), 431–449.
- Houston, M. J. (2016). *How to think like Leonardo da Vinci: Seven steps to genius everyday*. New York: Dell.
- Jacobs J.C.G, Van Luijk, S.J., Van Berkel, H., Van der Vleuten, C.S P.M., Croiset, G., Scheele, F. (2014) Development of an instrument (the COLT) to measure conceptions on learning and teaching of teachers, in student-centred medical education, *Medical teacher*, 34, pp. 483–491.
- Kember, D. (2019) Promoting student-centred forms of learning across an entire university, *High Education*, vol. 58, pp. 1–13
- Keraro, F.N., Wachanga, S.W., & Orora, W. (2017). Effects of cooperative concept mapping teaching approach on secondary school students motivation in biology, Gucha District, Kenya. *International Journal of Science and Mathematics Education*, 5, 111-124.
- Lea, E, Balim, A. G. & Inela D. (2003). Mind mapping applications in special teaching methods courses for science teacher candidates and teacher candidates' opinions concerning the applications. *Procedia*, 1 (1), 2274-2279.
- Lemos, S., DePorter, B., Reardon, M., & Nourie, S. (2014). *Quantum Teaching: Orchestrating students' success*. Boston: A Pearson Education Company.

- Longa, S. & Ahola, M. (2000). Mind Mapping: Learning and teaching with both sides of the brain. Retrieved from www.wordpress.com/teachingvillage
- Mc Combs, N. D. Ashman, A. F. & Conway, R.N. (2017) Cognitive strategies for special education. Retrieved from <http://www.infibeam.com/Books/search?author=Adrian%20F%20Ashman>. Ausubel, D. P. (1973). The psychology of meaningful verbal learning. New York, NY: Harvard University Press.
- Mclean, M., & Gibbs, L. (2015). Changes in the teaching and learning process in a complex system. New England Complex Systems Institute. Retrieved from <http://necsi.org/research/management/education/teachandlearn.html>
- Milanese, P., Hussain, F., & Hennessy, E. (2016). The efficacy of the ‘mind map’ study technique. *Medical Education*, 36, 426-431.
- Moore, R. (2000) Will Flexible Learning Raise Student Achievement? *Education Economics*, 13 (3), pp. 287–297.
- Moseley, P. A. (2014). Heritability of frontal brain function related to action monitoring. *Psychophysiology*, 45 (4), 524–534.
- NABTEB (2017). External examiner Reports.
- National Board for Technical Education (NBTE). (2000). National technical certificate and Advanced National Technical Certificate curriculum and module specifications for radio and TV works. Kaduna: Author
- National Board for Technical Education (NBTE). (2001). National technical certificate examination (craft level) syllabus for engineering trades based on the NBTE modular curricular. Kaduna: Author
- National Board for Technical Education (NBTE). (2011). Directory of accredited programmes in polytechnics, similar tertiary institutions, technical colleges, and vocational enterprise institutions in Nigeria (16th edition). Kaduna: Author
- National Board for Technical Education, NBTE (2016). Experiencing technology integration in education. Retrieved from www.NBTE.gov.ng/32_2011/3_2_139_151.pdf . accessed on 5th November, 2021
- NBTE (2013). Office Technology and management curriculum and course specifications.
- Nnamdi, S.O., & Rose, N.O. (2015). The effect of concept mapping and problem solving strategies on achievement in biology among Nigerian secondary school students. *Education Winter*, 131 (2), 288.
- Nwachukwu, C.E. (2016). Designing appropriate methodology in vocational and technical education for Nigeria. Nsukka: University Trust Publishers.
- Ogbuanya, T.C., & Usoro, A. D. (2009). Quality Teacher Preparation for Effective Implementation of Technical in Nigeria. *Nigerian Vocational Journal*, 14(1), 41-51.
- Ogwo, U. & Oranu B.A. (2006). Effects of meta-learning instructional strategies on students achievement in metal work technology (Unpublished doctoral thesis). Department of Vocational Teacher Education, University of Nigeria, Nsukka.
- Ogwo, U.Q. & Oramu B.A. (2006). Modern instructional techniques and their application in technical/vocational education (TVE) programmes of polytechnics and monotechnics. A commissioned paper presented at Abeokuta, MoshoodAbiola Polytechnic;

- AkwaIbom Polytechnic, and Federal Polytechnic Auchi (from August 24-November,2).
- Okoro, K. (2014) *Management of Organizational Behaviour*, PrenticeHall, Englewood Cliffs.
- Olaitan, F. A. (2017). Average student and effectiveness of problem-solving instructional strategies. *Ife Journal of Educational Studies*, 4(1), 16-19.
- Oloruntoba, L. (2019) *The Student-Centred Classroom*. Oxford University Press [Booklet]. Available at: http://www.cambridge.org/other_files/downloads/esl/booklets/Jones-Student-Centered.pdf [Accessed 2 December 2014].
- Onyishi, M.(2019)Personalisedlearning:Newdirectionsfor schools?Neweconomy,pp.224-228.
- Oranu, R. N. (2015).Methodology in Formal and Non-Formal
- Osafehinti, C.R. (2018). Learning strategies: Cognitive apprenticeship.Retrieved from <http://www.kaironews.org/nod/view/3515>.
- Pham, M.S. & Renshaw, O. L. (2013) *The mind's past*. USA: University of California Press.
- Plush, E. C. (2014). .Social and economic research principles and methods in Nigeria. *African Institute of Applied Economic Research*.
- Protheroe, M. (2017).Looking into pictures. Brooklyn: MIT Press
- Rizescu, M. D., Gall, J. P., & Borg, W. R. (2019). *Educational research: an introduction*. Boston. Pearson Educational Inc.
- Sanni, U.N.V. (2016).The effect of instruction in mathematics reading on pupils' achievement and retention in mathematics education. *Journal of Quality Education*, 1 (1), 67-72.
- Sarah, E. (2015) *The Student Centered Classroom, Social Studies and History*, vol. 1, pp. 19.
- Takashi, L. & Akbay A. Y. (2017). Experiencing technology integration in education. Retrieved from www.iejee.com/32_2011/3_2_139_151.pdf
- Ukoha, D. O. & Enegwe, V. K. (2017).The organization of behaviour: A neuropsychological theory of learning. Retrieved from www.psychoreview.com
- UNESCO (2017). Influence of sex difference of students in rural and urban areas in Africa. *Report on Sex Difference* 6(3), 56-58.
- Union, M. (2018). Quantum Learning: Membiasakan Belajar Nyamandan Menyenangkan.
- Uwaifo, R. (2013). Enhancing freshman students' writing skills with a mind mapping software. *Paper presented at the 5th International Scientific Conference, e- Learning and Software for Education*.7(2), 81-84. Bucharest.
- Wenchieh, J. & Hwang, U.N.V. (2010). The effect of instruction in mathematics reading on pupils' achievement and retention in mathematics education. *Journal of Quality Education*, 1 (1), 67-72.
- Zepp, A. (2015). *Conducting research in education and the social sciences*. Enugu: Tian, 67-69.
- Zhu, E. U. & Engels, M. V. (2013). *Overview of research methodology*. In E. U. Anyakoha (Ed.), *Developing research skills: Concepts and conceptual frameworks*(pp. 7-20). Enugu: Great AP Express Publishers Ltd.

APPENDIX A

QUESTIONNAIRE FOR TEACHER'S PERCEPTION IN THE APPLICATION OF STUDENT CENTER METHOD IN TEACHING AND LEARNING OF RADIO, TV IN ELECTRONICS WORK TRADE IN TECHNICAL COLLEGES IN NIGER STATE

FEDERAL UNIVERSITY OF TECHNOLOGY MINNA, NIGER STATE

SCHOOL OF SCIENCE AND TECHNOLOGY EDUCATION

DEPARTMENT OF INDUSTRIAL AND TECHNOLOGY EDUCATION

INTRODUCTION: please kindly complete this questionnaire by ticking (✓) the column that best represent your perception about the topic. The questionnaire is for research purpose and your view will be confidentially and strictly treated in response to the purpose of this research work.

PART I

PERSONAL DATA

Teaching Experience:

1 – 15years

16 – 30years

Note; A four point scale is used to indicate your opinion, tick the option which best describe your agreement as shown below.

Strongly Agreed = SA, Agreed = A, Strongly Disagreed = SD, Disagree = D

Highly Required = HR, Moderately Required = MR, Required= R, Not Required= NR

PART II

Respond options for this section are:

Highly Required = HR, Moderately Required = MR, Required= R, Not Required= NR

SECTION A

RESEARCH QUESTION ONE

What are the attitude of teachers in the application of student center method in the teaching and learning radio, TV and electronics work trade in Technical colleges in Niger State?

S/N	ITEMS	SA	A	D	SD
1	Teachers expected that student-centred method activities would be active				
2	Teachers expected that student-centred method activities would be interactive				
3	Teachers perceive that student-centred method activities would be contain group work				
4	student-centred method activities is creative in nature				
5	It offer flexibility in the choice of modules				
6	Teachers perceive that Student Centred Method ensure continuous qualitative feedback				
7	Teachers perceive that students should have a say in learning outcomes				
8	There should be respect for students				
9	Students Centred Method students would be treated as adults and be given greater responsibility.				
10	Students Centred Method is an empowering process, more motivating and include constructive feedback				

SECTION B

Respond options for this section are:

Highly Required = HR, Moderately Required = MR, Required= R, Not Required= NR

RESEARCH QUESTION TWO

What are the resources available for implementing students centre methods for teaching and learning RTV in electronics work trade?

S/N	ITEM	HR	MR	R	NR
1	Internet services				
2	Computers				
3	Projectors				

4	e-library				
5	Interactive board				
6	Consistent power supply				
7	Equipped workshop				
8	Available safety rules during RTV practical class				
9	Radio and Television				
10	Visual aid				

SECTION C

Respond options for this section are:

Highly Required = HR, Moderately Required = MR, Required= R, Not Required= NR

RESEARCH QUESTION THREE

3.To what extent students centred method are implemented in radio, television in technical colleges.

S/N	ITEMS	HR	MR	R	NR
1	I rarely arrange the students into groups for tam work.				
2	I encourage students to ask questions.				
3	I discourage the students to explore their current beliefs				
4	I often confront the students with problem to solve.				
5	I encourage students to deduce general principles from practical experiences.				
6	I consciously create conditions to stimulate students need to Know.				
7	I discuss worksheet results with students.				
8	I think cooperative work in groups is good for efficient learning.				
9	I frequently ask open-ended questions				
10.	I praise students works as often as possible				
11	I help students to take responsibility for their own learning				