

**STRATEGIES FOR IMPROVING PRACTICAL SKILL ACQUISITION OF BUILDING
TECHNOLOGY STUDENTS IN TECHNICAL COLLEGES IN NIGER STATE**

BY

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2018/3/74394TI

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

APRIL, 2023

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**A RESEARCH PROJECT SUBMITTED TO THE
DEPARTMENT OF INDUSTRIAL AND TECHNOLOGY EDUCATION
FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA IN PARTIAL FULFILLMENT
OF THE REQUIREMENT FOR THE AWARD OF BACHELOR OF TECHNOLOGY
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DECLARATION

I, Ozayashi John Osabonya with Matriculation Number 2018/3/74394TI 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 part or in full for any other diploma or degree of this or any other university.

Ozayashi John Osabonya
2018/3/74394TI

Date

CERTIFICATION

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

Mrs. Nwankwo, F. C
Project Supervisor

Date

Dr. T. M. Saba
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External Examiner

Date

DEDICATION

I dedicated this project to God Almighty for his divine grace and protection throughout the period of my study and to my lovely parents for their support, may Lord bless and reward you abundantly "Amen".

ACKNOWLEDGEMENT

I am much grateful to God almighty for given me life, wisdom, inspiration and grace to carryout this project. I do express my profound gratitude to my supervisor, Mrs F. C. Nwankwo for her guidance and timely contribution towards this project may Almighty God reward your efforts. My appreciation goes to Dr Ibrahim Dauda, Dr A. B. Kagara, Dr G. A. Usman, Mr Stephen N. Yisa for their efforts to the completion of my special thanks to the Dr T.M. Saba Head of the Department, the project coordinator Dr Hassan Abdullahi Mohammed and all other lecturers in the Department for their earnest contribution to my academic career. My gratitude goes to my wife and child Mrs patience John, Destiny and to my parents Mr Ozayashi Osabonya and my late mum Opane Ozayashi, late brother Dangana moses. And my siblings, Joseph, Mathew, Lami, Iyimoga Amegwa, Onana, Ajima and to my uncle's Chief Alh.Adamu Osabonya , Mr Christopher Odeh, Mr Samson odeh, Agbadu Onawo, Moses Onawo,Freedom,Emmanuel Osabonya , Jonathan Igavo, Daniel Osabonya, aunty Evelyn Onawo , Omogombo, Mary Osabonya, Martha Igavo, ground mum Rhoda Igavo and also to my friends Mr Andoma,shappiro, police man officer moh'd, James Osede, Abari John, Mr Samuel Ari, Ogah Benjamin David kero Oga Usman and to my coursemates Happiness, Mr. Daniel, Mr. Abraham and Ferdnard to well wishes for their advices, encouragement, support and also to all my relatives that I could did mention their names may the good Lord bless you all Amen.

ABSTRACT

This study examined the assess strategies for improving practical skill acquisition of building technology students in technical colleges in Niger state. Three research questions were developed to guide the study and three null hypotheses were tested at 0.05 level of significance. The study employed a survey research design. The study used a four-point scale questionnaire, which contains a total of 51-items, as instrument. In all, the total population of was 80 respondents comprising 58 building students from the six technical colleges and 22 technical teachers. The result showed Mixing of cement, sand and gravel plus water in their right proportion, Emphasis should be laid on how to use a particular tool or equipment/machine and Visiting relevant building industries for practical skill acquisition (field trip). The study recommended among other things, Workshop and seminars should be organized for Building Technology teachers on current technologies/issues in Building Technology from time to time.

TABLE OF CONTENTS

Cover Page	i
Title page	ii
Declaration	iii
Certification	iv
Dedication	v
Acknowledgements	vi
Abstract	vii
Table of contents	viii
CHAPTER ONE	
1.0 INTRODUCTION	1
1.1 Background to the Study	1
1.2 Statement of the Problem	4
1.3 Purpose of the Study	5
1.4 Significance of the Study	5
1.5 Scope of the Study	7
1.6 Research Questions	7
1.7 Hypotheses	7
CHAPTER TWO	
2.0 LITERATURE REVIEW	9
2.1 Theoretical Framework	9
2.1.1 Theory of Skill Development	10
2.2 Conceptual Framework	11
2.2.1 Concept of Skill Acquisition	11
2.2.2 Building Technology in Technical Colleges	16
2.2.3 Skill Acquisition in Building Technology in Technical Colleges	18
2.2.4 Technical and Building Technology Skills in Technical Colleges	20
2.2.5 Teaching Methods for teaching Building Technology Theories and practical in Technical Colleges	21
2.2.6 Evaluation Strategies in Technical Colleges	25
2.3 Related Empirical Studies	28
2.4 Summary of Review of Related Literature	30

CHAPTER THREE	
3.0 RESEARCH METHODOLOGY	32
3.1 Design of the Study	32
3.2 Area of the Study	32
3.3 Population of the Study	32
3.4 Sample and Sampling Technique	33
3.5 Instrument of Data Collection	33
3.6 Validation of the Instrument	33
3.7 Reliability of instrument	34
3.8 Administration of the Instrument.	34
3.9 Method of Data Analysis	34
3.10 Decision Rule	35
CHAPTER FOUR	
4.0 PRESENTATION AND ANALYSIS OF DATA	36
4.1 Research question One	36
4.2 Research question Two	38
4.3 Research question Three	39
4.4 Hypothesis One	41
4.5 Hypothesis Two	42
4.6 Hypothesis Three	44
4.7 Findings of the study	45
4.8 Discussions of Findings	48
CHAPTER FIVE	
5.0 CONCLUSION AND RECOMMEDATIONS	52
5.1 Summary of the Study	52
5.2 Implications of the Study	53
5.3 Contribution to Knowledge	53
5.4 Conclusion	53
5.5 Recommendations	53
5.6 Suggestion for Further Study	54
REFERENCES	55
APPENDIX	58

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The ultimate goal of Technical Vocational Education and Training (TVET) is for the acquisition of knowledge, attitude and practical skills for sustainable development. The training of TVET students is based on the production of goods and services that are not only relevant to themselves but to the society (Wiiumi, 2021). TVET equip students with practical skills in different field of work such as building technology, automobile technology, metalwork technology, woodwork technology and electrical/electronic technology.

Building technology is a field of work that equip students with various practical skills in all works related to building and constructions Okoli (2021). Building technology is an aspect of vocational technical education. According to Adebisi (2012) TVET is any form of education whose purpose is to prepare person(s) for employment in an occupation or group of occupations. Modebelu, (2014) stated that vocational technical education is the acquisition of skills and techniques in chosen occupation or profession to enable an individual earn a living. Building technology programme at the technical college level is designed to produce skilled builders for the building industry. A technical college is post primary technical institution established to offer vocational technical programmes. It is established to equip students with technical skills to earn a living. (Akpan, 2003) cited in Chioke (2018) noted that technical college is equivalent to senior secondary but designed to prepare individuals to acquire practical skills, basic scientific knowledge and attitude required as craftsmen and technicians at sub-professional level. According to Okorie (2001), technical college in Nigeria was established to prepare individual to acquire practical skills and basic scientific knowledge. It is charged with the production of skilled personnel in the area of mechanical technology,

metalwork technology, electrical/electronic technology, wood work and building technology for the needs of society (Ibidapo, 2021).

Building technology as a course comprises of different components or operations which require skills to perform them. These components include designing of building plans, setting out of the building, execution, block work on the concrete foundation, levelling of the building, roofing pattern, plastering and rendering of walls (Awolusi, 2017). These areas of operation require that students of building technology should possess the necessary skills to carry them out. Building technology students should possess skills in designing building plans and be able to read and interpret them. Students of building technology should possess skills in setting out of buildings, form block walls on the concrete foundation, be able to level the building and also possess skills in designing good roofing pattern. Adeyemi and Uko–Aviomoh (2004) viewed vocational technical education as an aspect of education which leads to the acquisition of practical and applied skills.. Skills according to Wikipedia (2009) are the learned capacities to carry out pre-determined results often with minimum outlay of time and energy. Skill according to Okorie (2000) is a manual dexterity through repetitive performance of an operation. Okorie (2000) further explained that skill is expertise, practised ability, dexterity of tact. It is well established habits of doing things by the people. Skills could be gained through experience and training on skill acquisition and development (Bakare, 2006).

Skill acquisition according to Aliozor (2004) is the process by which individuals are expected to learn and continuous practice in particular task till the learner becomes proficient in the operation and can perform them when required. Okorie (2000) said that skills are acquired when procedural instructions are matched with performance activities. For skills to be acquired, there must be opportunities for participation and practice of such skills under real life situation. Skill acquisition is very necessary at this stage of Nigeria's economic and

technological development. Edokpolor, and Owenvbiugie, (2017) said that the acquisition of skills prepares students for vocational occupation and progressive development in it. Skill acquisition remains the major goal of vocational technical education and this helps to satisfy the personal work needs of both the individual and the society (Aliozor, 2004). To acquire skills in vocational technical education courses such as building technology at technical college level, opportunities must be provided for students to practice the skills they are taught in an environment that is relevant to the job skills learnt. Such opportunities that should be provided that may improve skill acquisition of building technology students include field trip/excursion, allocation of more time for practical work, production unit, provision of materials to practice with.

For proper skill acquisition in Building Technology, appropriate teaching strategies must be applied by teachers for teaching both the theory and practical aspect of building technology. Teachers also need relevant building tools and equipment for imparting skills to students under their control. A teacher in the opinion of Hornby (2000) is a person who gives instruction to a learner, that is, a person who communicates knowledge, skills and attitudes to someone in a school. In the context of this study, a teacher of Building Technology is one who gives instructions, communicates knowledge, skills and attitudes in building technology to students. The acquisition of life-long practical skills calls for effective and efficient teaching strategies, appropriate evaluation methods and utilization of standard teaching materials; tools, machines, and equipment to ensure the production of desired graduates with practical skills. Other requirements include training manuals and availability of qualified teachers with experiences.

Without acquiring building skills, graduates of building technology can never be functional in the society. Building skills are teachable skills. They can only be acquired when relevant

materials, tools and equipment are available for teaching. Relevant tools and equipment enhance practical teaching and learning process. Quality of instructions offered to the students depends on the teaching strategies employed. The process of offering quality instructions to students involves the use of sophisticated tools, equipment and machines, delicate materials and complex methods of work Ogbuzuru, (2016). This now demands for skilled graduates to be involved in building technology practices in the state. Hence, it is imperative to determine the strategies for improving practical skill acquisition of building technology students in technical colleges in Niger state

1.2 Statement of the Problem

Building technology programme in technical colleges is aimed at producing skilled craftsmen who will be able to perform basic functions in building technology both in private and public sector (NBTE, 2001). Unemployment among youths is on the increase. This may be due to little or no skill acquired by the students during training in technical colleges. The consequences of unemployment among youths according to Ibidapo (2021) include burglaries, robbery, psychological and financial stresses, fear, anxiety, aggression, frustration, prostitution, drug addition, vagrancy, poverty, hunger and diseases.

The teaching of technical subjects has been too theoretical that many students prefer subjects in Arts and Social Sciences because there is no longer much emphasis on the learners' practical skills acquisition in technical colleges. Teachers in most cases use lecture method only in a programme instead of applying a variety of strategies like demonstration and discussion or guided discovery and discussion

Another problem is inadequate supervision of practical activities. Ronoh, (2021) observed that the usual practice is that students' practical projects are inspected at the end of the

process, but adequate supervision on the whole practical process has a major influence on the overall performance and efficiency of skills acquisition. This problem could be as a result of lack of adequate strategies in the teaching and learning processes. Therefore, the study sought to determine the strategies for improving practical skill acquisition of building technology students in technical colleges in Niger state.

1.3 Purpose of the Study

The major purpose of this study is to assess strategies for improving practical skill acquisition of building technology students in technical colleges in Niger state. Specifically; the study will determine:

1. Skills required in Building Technology by Building Technology teachers for improving practical skill acquisition of building technology students in technical colleges in Niger state.
2. Teaching strategies of Building Technology theory to improve skill acquisition of Building Technology students in technical colleges in Niger state
3. Teaching practical strategies of Building Technology that will enhance skill acquisition of Building Technology students in technical colleges in Niger state

1.4 Significance of the Study

The findings of this study will be of benefit to the teachers of building technology, students of building technology, the communities where the institutions are located, curriculum, planners, the school administrators, the state and researchers.

The study will benefit teachers of building technology in the following ways. It will help building technology teachers to teach those saleable building technology skills that will enhance the students' performance after graduation..

The findings of this study will be of benefit to the students of building technology. If the findings of this study are properly implemented, the students of building technology will graduate with enough saleable skills that can make them to be self-employed or work in building industries. Building technology tools and equipment to establish their own business will be known to them, thereby reducing unemployment among students after graduation.

Communities will also benefit from the findings of the study in the following ways: If the findings are properly implemented, the result will be that students of building technology will begin to establish building outfit for themselves and thereby developing the area. As the businesses grow, they create job opportunities for others to be employed. When this happens, it does not only develop the community but also helps to reduce unemployment, crimes and other social vices among youths. The schools from where these students graduate will benefit from the findings of this study in this specific way. If the institutions have functional production unit, then the production unit will not only generate fund for the school but can as well undertake some infrastructural development in the school at a very low cost.

The findings of this study if properly implemented will benefit building industries. Building industries will have enough skilled personnel who possess relevant building skills that can make them excel and face challenges in their workplace. The study will also help building industries to have enough skilled building technicians to take care of their work needs.

The findings of this study will provide useful information to the government, the school management board, especially, National Board for Technical Education, curriculum planners on the strategies for improving skill acquisition. The identified strategies will be integrated into the building technology's curriculum in order to teach students. The findings of this study will also serve as source of information to research students.

1.5 Scope of the study

This study is to determine the strategies for improving practical skill acquisition of building technology students in technical colleges in Niger state. The study will also identify skills in Building Technology that can improve students' performance, teaching strategies, teaching practical strategies.

1.6 Research Questions

1. What are the Skills required in Building Technology by Building Technology teachers for improving practical skill acquisition of building technology students in technical colleges in Niger state?
2. What are the Teaching strategies of Building Technology theory to improve skill acquisition of Building Technology students in technical colleges in Niger state?
3. What are the Teaching practical strategies of Building Technology that will enhance skill acquisition of Building Technology students in technical colleges in Niger state?

1.7 Hypotheses

The following null hypothesis will be tested at 0.05 level of significance:

H₀₁: There is no significant difference between the mean responses of Building technology students and building technology teachers on Skills required in Building Technology by Building Technology teachers for improving practical skill acquisition of building technology students in technical colleges in Niger state

H₀₂: There is no significant difference between the mean responses of Building technology students and building technology teachers on teaching strategies of Building Technology

theory to improve skill acquisition of Building Technology students in technical colleges in Niger state

H₀₃: There is no significant difference between the mean responses of Building technology students and building technology teachers on teaching practical strategies of Building Technology that will enhance skill acquisition of Building Technology students in technical colleges in Niger state

CHAPTER TWO

LITERATURE REVIEW

The review of related literature to this study is organized under the following subheadings:

2.1 Theoretical Framework

2.1.1 Theory of Skill Development

2.2 Conceptual Framework

2.2.1 Concept of Skill Acquisition

2.2.2 Building Technology in Technical Colleges

2.2.3 Skill Acquisition in Building Technology in Technical Colleges

2.2.4 Technical and Building Technology Skills in Technical Colleges

2.2.5 Teaching Methods for teaching Building Technology Theories and practical in Technical Colleges.

2.2.6 Evaluation Strategies in Technical Colleges.

2.3 Related Empirical Studies

2.4 Summary of Review of Related Literature

2.1 Theoretical Framework

2.1.1 Theory of Skill Development

Theory of skill development was propounded by Cratty, (1973). The theory states that individuals have tendency of developing skills in an occupation as a result of continuous or repetitive practice. It is stated that practical skills are essential skills that could be acquired through repetitive means in all technical occupations or professions. It is on this premise that the major objective of all Technical Colleges' programmed should make provision for practical skills to its graduates for self-reliant. Therefore the teaching of vocational education at technical college level should mostly focus on practical skills so as to enable the students acquire marketable skills. Technical Colleges programmed therefore cannot be said to have accomplished without practical skills manifestation.

It is also stressed that skills acquisition cannot be expressed in word but only through demonstration. Theory of skill development is related to the present study in that graduates of and maintenance work technology need to develop skills for effective performance in their various industries or workplaces. Development of relevant skills makes them fit into various sit or positions in relevant industries. Without skills being develop there will be unemployment among graduates of general installation and maintenance work engineering craft students.

Skill development is a key factor in the employability of workers and the sustainability of enterprises, it is one of the objectives of skills development system to ensure that the skills acquired match the skills valued in the work place. Skills development systems must also help workers and enterprises adjust to changes and handle new conditions by constantly improving their skills to meet up with the climatic change, globalization, demographic trends,

technological innovation and/or financial crisis. This is in line with the theory of technical and vocational skill development (TTVSD) by Stevenson (2005). TTSD states that improvement needs in skill development under lie vocational choice development, employability, mobility and sustainability of socio-economy of energy progressive society. Hence this theory is relevant to this study because technological innovations and advancement in general installation and maintenance works is complex and each subsystem of the modern general equipment, machineries, and tools is indeed a challenge to industries in Nigeria if there is no workforce to man them for high productivity.

2.2 Conceptual Framework

2.2.1 Concept of Skill Acquisition

People working in the specialized fields required technical and knowledge in order to meet the requirements of continually changing environment of the various woodwork industries. The basic skills are needed to function effectively in the world of work. Technical competence or skills refers to both the theoretical knowledge and practical skills required by the students in the course of their education and training in the technical colleges. It also means to acquaint the graduates with all the basic knowledge and practices which they need to be able to function effectively in the world of work (Schaltegger & Burritt, 2017).

Technical competence is also referred to, as the technical skills or industry based skills embedded in the school curriculum (Pan & Seow, 2016). According to Nwokike and Eya (2015), technical skills refer to the ability to do or perform an activity in relation to some meaningful work. He further stressed that it presents challenges to the learner by integrating practical work, theoretical knowledge, common sense, observation ability and encouragement in an occupation. Kayode and Ayodele (2015) asserted that technical skill involve

application of mental and physical activities. He also described it as ability to handle objects in a skillful manner. According to him it also enables an individual to develop physical, social, intellectual, economic and emotional capabilities. Kayode and Ayodele further pointed out that an individual who wants to acquire technical skills must possess qualities such as interest, ability, aptitude, practice, personality characteristics and physical qualities.

The acquisition of psychomotor skills is central in vocational technical education. Teachers of technology are therefore expected not only to possess relevant production skills but are also required to know the process of developing psychomotor skills and to focus on them when they teach their own students. This will enable the teachers to set up appropriate training techniques that will guide them in teaching students most effectively and efficiently.

An understanding of the process by which psychomotor skills are acquired is a basic condition for effective vocational education training. This process has variously been described by several scientists (Dickson & Chujor, 2017). The studies of these authors in the theories of skills acquisition have culminated into what has been known today as the six levels of steps of psychomotor skills acquisition, namely: perceiving, motivating, performing, adapting and innovation.

Perceiving with respect to teaching psychomotor skills, in vocational education, Nweke, (2017) stressed that the teacher should develop in students a strong desire to possess the manipulative ability. He should be genuinely interested in their skillful performance. It may be desirable or even necessary to have the students see a product that has been produced by a skilled person or in some cases, see the skill performance while it is in progress. This may not only motivate the students, it could develop in them an ideal. The student must know why the skill is needed if they want to possess it and they must feel the need for that ability.

Merely telling them (as it is often done in theory lessons) that one ought to know how to do this will not supply a vigorous motive. The authors then concluded that the teacher should see that the students have a clear and correct picture (or perception) of what is to be achieved for motivation; otherwise not much improvement can be achieved.

Motivation in describing psychomotor skills acquisition, Dickson and Chujor (2017) indicated that setting goals and / or solving problem must be the first step in creating motivation in the learner or trainee. Motivation involves satisfaction, needs, rewards, and/or punishment. Initial arousal of an intention seems to be prerequisite which operates as a trigger for further action. There are indications that engaging in an activity and practicing are meaningful only when the learner shows an appropriate indication of motivation. To this, Asele, (2016) states that motivation or incentive seems to be the activator and sustainer of action or thought when acquiring a psychomotor skill. Goals are an essential part of the process of acquiring psychomotor skills. They may be externally directed by another person or internally directed or both. It looks like many psychomotor skills are attained because the learner wants to, or because it feels good to the learner. It was pointed out that various kind of external stimulation and positive internal feedback make possible a high level of achievement in psychomotor skills. In teaching and learning process both internal and external sources of motivation should be employed. Without effective motivation or incentive which may lead to imitation, psychomotor skills would not be acquired or may be poorly attained at best.

Imitation is the stage where the learner is involved in mental manipulation of the form, pattern, or sequence and or mimicking a series of patterns or procedures. In psychomotor skill acquisition, therefore, the learner receives the necessary cues, mentally manipulates the cues and organizes them into a series of set before attempting to perform a function.

As a practical ways of assisting students to imitate Harwood and Koyama (2020) advised that the teacher should ask the students to name the important steps in doing what they are now ready to learn to do. Furthermore, the teacher should demonstrate the procedure, if it is difficult for the students to understand. Usually in learning from a demonstration, the students watch being done, and then try their hands, at doing what was demonstrated. The teacher should show and explain how to perform each operation step by step. The students should be made to go through the process each trying his hand at it. Performing operation is necessary to acquiring the skill; knowledge and imitation alone cannot develop a manipulative skill.

Performing, by same authors point to the fact that practice is necessary pre-requisite for learning a task and learning process with an increase in the amount of practice. Students in vocational technical education need to be given enough opportunities to practice what they are being though in theory lessons. Usually, the students will need to develop considerable skill before using operation on a large scale or on a valuable piece of work. To develop this degree of skill, repeated practice exercise may be used which involves various operations and standard of workmanship, Olaitan, (2017) stated that work experience will be effective in proportion to the specific experience for training habits of doing and thinking through repetitive performance. When such is done students may be able to adopt well.

Adaption is the ability to perform expertly to the ultimate goal of most psychomotor skill training but ideally it should go beyond that. Umar and Rashid, (2019) recommended that certain psychomotor skill should be adapted to new situations (a sort of transfer of learning). Adapting according to Umar and Rashid, involves diagnosing and problem solving and the added dimension of creativity. Automatic action may be easier to evaluate, but vocational technical teachers should equally emphasize adaptive learning. This stem from the fact that

transfer of learning is often required in problem solving situation which is a typical characteristic of the productive or service world. Adoption may bring about innovation.

Innovation is the highest level of psychomotor skill acquisition, which emphasizes the ability to experiment and create new forms of the learned skill. Singer (1981) stressed that the opportunity to express feelings and to gain a feeling of self-actualization are inherent in the innovative act. Innovation presents a challenge and an opportunity for fulfillment and positive self-concept. Expressing and symbolizing need not be restricted to the other fields of Endeavour but equally applicable to the fields of industry. Indeed, in the words of Umar and Rashid, (2019) “that uniqueness and variation from standard forms characterize creative activity.

Innovation requires all the domains of learning and creativity, and much feedback. The need to provide adequate exposure to students who are enrolled in vocational technical programmed in practical skill areas while in school has variously been emphasized by vocational and technical educators. Olaitan,(2017) for instance observed that vocational technical education is education for work, hence technical teachers should expose trainees to learning in job related models and in an environment that depicts real work situations.

Ndinechi (1994) stressed the need to strengthen the links between learning in school and the practice of work with the aim of facilitating the transition from school to employment. Ali, in Olaitan, (2017), remarked that while many subjects may be more theoretical than practical, vocational technical education is more practical than theoretical, hence every effort must be made to expose learners to practical situations where skills and knowledge could be learned concurrently. Indeed, it may be said that any instructional arrangement that is initiated to facilitate the process of skills acquisition in vocational technical institution is a commendable

innovation and a giant step in the right direction. The only way to learn practical skill is by doing. Since the ultimate goal of vocational technical education is preparing an individual for work, any learning situation that promotes the accumulation of theoretical knowledge only at the expense of practical interaction with the objects and equipment is not only operating contrary to the principles of vocational technical education but runs the risk of operating an irrelevant curriculum (Gowon, 2004).

2.2.2 Building Technology in Technical Colleges

Human beings of today have basic needs for shelter (building) the early men went into caves for shelter, but this could not protect them from wild animals, cool weather and hot weather. People in the process of time required an aspect of education that involves in addition to general education, skills attitudes, understanding and knowledge relating to occupation in various sectors of economic and social life.

(Ogbuzuru, 2016) stated that, teaching is a research activity in which the teacher as a facilitator creates opportunities for learners to observe situations and investigate phenomena. He stressed that it is only after this has been settled that efforts invested in curriculum development can yield visible results. Building Technology plays a vital role in the economic development of any Nation. Being a developing country, the following are the identifiable roles which Building Construction as a programme could play in Nigeria economic development.

- Meeting the demands of a rapidly growing population for much better and cheaper buildings.
- Supplying adequate and cheap raw materials for building local industries.

- Foreign exchange or capital information through increased earnings from building exports.
 - Providing markets for industrial/manufactured consumer goods and providing profitable employment opportunities in the rural areas for our teaming school leavers.
- If building construction must play these roles, the need for buildings construction development should therefore be paramount in the technical colleges program

Building technology is a branch of environmental studies which deal with building construction, the emphasis is on the building team or personnel involve in the construction, building industries and the process of construction principles and practice of constructional tools, equipment and materials and organization of building industry, like the client, Architect, Quantity Surveyor, Engineer, Land Surveyor, Builders and Constructors. El-Haggag and Samaha, (2019) describe, building construction as any industry that has the main objective of constructing, renovating, demolishing, relocating, maintaining and repairing of buildings, chimneys, sporting, recreational activities waste disposal, fencing, landscaping, structural works using building equipment and tools. (Myers, 2016) stated that building construction covers a wide range of loosely integrated group involved in the construction, renovation, alteration repairs and maintenance of buildings. (Ogbuzuru, 2016) observes that, building construction satisfies man's needs for shelter and infrastructures such as houses, schools, offices, hospitals, shops, factories, recreational facilities warehouses, banks, churches etc. and to construct all equipment, tools and materials are involved. Thus building construction is the pivotal and primary conduit for infrastructure development in developed and developing countries. Building construction is an organized education which is directly related to preparation of individual for paid or unpaid employment or for additional preparation for a career. Preiser, et al. (2015) stated that, building construction is a type of

technical programme designed specifically to improve efficiency of a person in specific occupation, through and learn in relation to Manca and Ranieri (2017). explained that, the most crucial change agents in building construction programmes are the teachers with adequate skills, knowledge and information in the area of building construction. It is therefore important to import the spirit of programme among building construction students in primary and secondary schools through efficient and tracked B.Sc. building technology teachers. In order to develop building construction programme in technical colleges and information necessary in building construction programmes. It is also necessary to identify objectives, content and teaching methods of the programme in technical colleges.

2.2.3 Skill Acquisition in Building Technology in Technical Colleges

Vocational education is the education for work. It is all about skill. There is the need to assist people to learn and acquire appropriate knowledge, habits of thought and conduct, skill as well as other qualities of character that will enable them to develop intellectually, socially, physically, emotionally, morally, spiritually, politically and economically Thurlings, et al, (2015).. Skill acquisition is one of such ways of learning. (ASRES, 2020) described skill acquisition as a process by which individuals are exposed to the learning and continuous practices in a particular task till the learner becomes proficient in the operation and can perform them when required. Skills are therefore, acquired first and developed subsequently, through utilization and practice. According to (Ibelegbu, 2017)., skills are acquired when procedural instructions are matched with performance activities. He added that repetition is the watchword. (Okon, 2016). said that for students to acquire skills in vocational education courses such as building technology, metal work, woodwork etc. opportunity should be provided for them to practice the skills they are taught in an environment that is relevant to the job skills learnt. For instance, science laboratories are provided in studying sciences, and

the students are taught the practical aspect of the subjects. In the same manner, typing pools, office practice and language laboratories, computer rooms or laboratories are for business and computer education. Workshops are for technical education students where skills can be acquired.

To acquired skills according to (Olubisi, 2018), three factors are involved; they include imitation, repetition and participation.

- To imitate implies to mimic or copy the behaviour or acts of the teacher by students. As they watch the teacher perform certain acts, they consciously or unconsciously follow and practice the examples of the teacher.
- Repetition involves the performance of an act many times to master the act. They highlighted that after acquiring a skill, the learner must repeat the action many times before he attains any useful degree of readiness.
- Participation in vocational education involves the learners practicing under the actual production conditions or situations. They adduced that both the imitation of a master and frequent practice, fall short of complete preparation for skilled vocational practice, hence the need for practice by the learner in the actual production conditions.

Mgbeahurike (2000) observed that the process of skill acquisition involves the following; observation, imitation, manipulation, performing and perfecting. Olaitan (1996) explained that in the course of developing skills in an occupation, knowledge and ability required for success in that occupation should be taught. This is because skills consist of habits, which must ensure adaptation. The acquisition of skill is important in vocational education since it is occupationally oriented. Okorie (2001) said that if education is preparation for life and if practically every one's life and opportunities for self-expression The relevance of acquisition

of skills on the part of vocational education graduates or her teachers is that it equips the teachers as well as those who acquired them well enough to be able to apply the relevant skills acquired and developed in the management of their laboratories and other members of staff (Aliozor, 2004). Skill acquisition in building technology to Nigerians economy cannot be over – stressed. People who have acquired skills in different spheres of life endeavours are sure to be either self-employed or they secure related employment in government agencies or in private business organization. Okoro (1993), pointed out that the purpose of vocational education is not to reduce people’s need for work but rather to make more pleasant and productive. Skill acquisition remains the major goal of vocational education and this helps to satisfy the personal work needs of both the individual and the society. And fulfillment include work and skills possessed, then only the successfully employable are successfully educated and skilled.

2.2.4 Technical and Building Technology Skills in Technical Colleges

Technical skills are important skills in vocational and technical education. Vocational and technical education is an education for work. Work can only be done if necessary skills are acquired. A technical skill according to (Ibidapo, 2021) is the ability or dexterity in the use of tools effectively and in an efficient manner. (Ibidapo, 2021) defined technical skill as the most important skills required in the modern workplace which involve the understanding, use and application of various technologies in the workplace. Technologies ranged from information technology through to robotics, computerized production systems equipment and machinery. Employers therefore need their employees to be able to operate within a technological environment. However, the most importance of this skill according to the body is in terms of information and communications technology. Technical skill is the answer in a work place. Employers need their employees to have technical skills relevant not just to a

particular job but to participate in a range of work-related processes. Employees are then required to become familiar with relevant software and technological procedures that are increasingly becoming the norm in most modern workplaces.

The body reviewed that there are four areas where technical skills would need to be applied in the workplace depending on the context and the experience of the employees. These areas include:

- Routine work – use of programs such as Word, Excel, Power point and Lotus Notes, which are part of the everyday communication processes; use of programs to manage production processes.
- Specialized technical work – use of software to plan and subsequently manage project timelines and costs, and design products and services.
- Design or adaptation – use of principles and theories of electronics and IT to design or adapt software in order to provide a technical solution to a common problem.
- Information seeking – use of the internal and intranets to identify successful strategies used by overseas affiliates.

2.2.5 Teaching Methods for teaching Building Technology Theories and practical in Technical Colleges.

The use of appropriate teaching methods is an essential ingredient in providing qualitative training in vocational technical Education. The method to employ in any given situation, according to Hatlevik, et al, (2018), is determined by the following factors:

- Nature of subject matter taught and objectives to be attained.

- Nature and Number of students involved;
- Time available for the lesson.
- Facilities and materials available.
- Interest and ability of the teacher.
- Effectiveness of the methods.

(Achora, 2014). , noted that there is no one method that is considered sufficient to ensure the acquisition of qualitative education. He added that teachers should choose a combination of methods when teaching so as to achieve the following objectives:

- Ensure that the students are taught the correct materials.
- Make sure the students understand the basic concept.
- Help the students acquire practical laboratory or workshop skills.
- Motivate the interest of the students in the subject and
- Develop the abilities of the students to express themselves in their own words.

Eze and Okorafor (2012) state that technical and vocational courses are taught in junior secondary school, senior secondary school, technical colleges and polytechnics. He said that different teaching methods should be used at these levels. He goes on to explain the principles guiding the choice of particular teaching methods in the different institutions, and concerning technical college and polytechnics he said:

In technical colleges and polytechnics the aim of vocational and technical education is full occupational preparation. The tools, equipment and procedures normally used in the occupation the student is preparing for, must be used in the teaching process. Students should

be trained to attain full occupational mastery in their respective occupations so that they will function effectively in their places of employment and win the respect and administration of their employers and customers.

(Joshua, 2015) further asserts that in practical arts courses students learn about various occupations and acquire general skills in the use of hand tools. They learn about the necessity for human being to work and are encouraged to develop good attitudes towards work. He also state that all technical courses irrespective of their levels and objectives must stress practical activity, any technical courses in which a large proportion of the allotted time is not devoted to practical work, projects and experiment is not likely to be very successful. Mere provision of technical information, according to Joshua, cannot serve that demand of vocational and technical education, adding that both in prevocational and vocational course, the use of tools and equipment should be considered on indispensable component even though the types of tools and equipment used might vary.

These tools and equipment are mostly unserviceable, the instructions of some of these equipment are written in the languages not spoken in the country. This contributed to the poor teaching in the educational system. In most of the technical institutions in Nigeria, lessons are mostly theoretical (Ugwu, 2016). This means learners cannot apply what they have learnt in solving new or unfamiliar problems. Hence, the failure of technical colleges in producing employable manpower in Nigeria's labour market. (Ololube, 2013) contends that the educational and skills level of a country's workforce can determine how much and how widely diffused is the technological progress it can achieve.

The failure of psycho-productive skill acquisition in technical colleges in Nigeria is mostly blamed on technology teacher programme. The teachers produced today from various

technical institutions, seem not to be prepared for teaching technology programme. The present trend tends to suggest that there is inadequate opportunity for graduates from technical institutions to relate what they have learnt to the real world. Also technology teacher education tends to be more suggestion and theoretical in approach than desired. Most of the time, two or three experts are assembled to draw curriculum for technology education instead of involving subject matter specialists and practitioners in the field, hence the drawn curriculum becomes unproductive Pantić and Wubbels (2010).

The solution to the problem ties on Nigeria's ability to make the country's technological curriculum to lay more emphasis on inter-disciplinary skills. The curriculum should be structured to provide learning experiences in transportation, manufacturing, construction and communication technologies. This is because, these activities are basic to every society. In developing curricula and curriculum guides, it is necessary to use the input of teachers of technology, education administrators, and experts from industries and Industrial Training Fund (Enemali, 1998).

Practical project is an activity or an instructional method which tends to aid students in organizing and integrating their experiences as they put their efforts toward solving a given problem. Such activities are usually characterized by doing actions such as designing, constructing, repairing and experimenting.

The importance of practical in vocational and technical college need not to be over emphasized. This is because;

- Practical projects help students in organizing their experiences as they put effort towards getting solutions to their problems.

- Practical project provides teachers with a basis for assessing the learning outcomes, Originality and creativity of their students.

2.2.6 Evaluation Strategies in Technical Colleges.

A lot of technical teachers do not take their time to properly evaluate their students' practical even though the practical have caused the students energy, time, money and materials resources to complete. Part of the reasons often given is that, the practical projects are difficult and tedious to assess. A more convincing fact is that, the teachers themselves lack the methodology and technicality of approaching the issue. Okoro (2002) identified six specific methods of evaluating project in practice which he summarized as follows:

Performance Testing

This method is employed in assessing mostly achievement of objectives in the psychomotor domain. The psychomotor domain of educational objectives is concerned with the practical or motor skills possessed by the students. It is usually referred to as alternative to practical and it could be in form of essay or objective test. For assessing psychomotor skills, practical performance test which involves setting students on a task and rating them as they work, is the best.

Product Evaluation Method

Product evaluation entails measuring and grading of only the final product or completed project work. The process involves observing the product and making appropriate judgment through the use of rating scales or checklist. Certain criteria are usually set on the characteristics to be observed in the product and scoring is appropriately done. Okoro (2002) maintained that the product evaluation alone is not a complete measure of assessment. To

him, this method should be combined with the process evaluation technique. According to him, this is because the product method alone is prone to abuse. Besides complete projects may merely have been executed by trial and errors means, yet since the focus is on the product, the students may not have actually followed the correct steps required, but could earn high marks based on the product without necessarily mastering the skill.

Process Evaluation Method

This method involves observing the student while he is carrying out the practical activity and rating him on the processes or procedures adopted. With this method, all steps and procedures followed to arrive are rated by the teacher. Because of the over concentration on the processes alone, this method too is not completely adequate for evaluating performance. This is because errors committed at the initial stages of production could be corrected so that it does not affect the final product.

Thus, without considering also the products, it would not be easy to justify the scores of a student's performance based on the process alone. The most appropriate way is to combine both the processes and the product methods when evaluating students' practical works.

Ranking Method

This is the simplest of the procedures and is employed only in product evaluation. All the products submitted by students are placed in rank order based on the possession of certain important qualities or base on the absence of defects. The teacher then assigns grades using the norm reference system for awarding grades. The best project might obtain the highest grade while the poorest project obtains poorest grade. In the ranking system of grading no external criterion measure is necessary, and individual's grade when compared to the products submitted by other students.

Checklist Methods

The methods are used both in process evaluation and product evaluation. In process evaluation, the teacher prepares a list of the things that a students should do in the process of carrying out an activity or completing a task. As the student engages in the task, the teacher observed and checks the activities or processes that are carried out by the students. Any activities not performed count against the student.

Checklists are useful in an accurate evaluation of processes and products especially in situations where products have few essential qualities, and processes are simple and can be performed correctly by all those who remember to perform them. Sometimes process checklists take into account the order of performance if an activity is performed out of sequence, it is checked as not being performed at all.

Rating Scales

Rating scales are evaluation instruments that assign numbers or descriptive words to processes and products to indicate how good they are considered to be. Rating scales may be regarded as checklists that have more than two response categories. They are more useful than checklist because, they do not merely show the activities that are performed or the characteristic that are possessed by a product, they indicate the quality of the performance or the characteristics. Rating scales provide more evaluation information than checklists. Although the words: very good, fair, satisfactory and unsatisfactory are not clearly defined in terms of quality, it is hope that the teacher could establish in his mind the level of performance that should attract each rating.

It is worth noting that, in line with the principles of Blooms Taxonomy of Educational objectives, the process of acquiring skills have been categorized into three by (Olaitan, 2017). and summarized as follows:

- Knowledge about the task to be executed (Cognitive).
- Attitudes, interest and value systems acquired, developed or exhibited in the course of producing the projects (affective).
- Physical skills acquired, developed or exhibited in the course of the project (psychomotor). This is why in carrying out any practical projects thinking and knowing what to use or do is required. Physically designing or constructing the work, as well as demonstrating good cooperative attitude towards the equipment work and others around is also very necessary. It becomes evidently clear therefore, that assessment of students' practical works should proceed logically from actions and their sequences to the outcome and its qualities

2.3 **Related Empirical Studies**

Ogbuzuru (2011) carried out a study to determine strategies for improving skill acquisition of building technology students in technical colleges in Ebonyi State. Survey research design was used for the study. The population for the study was 31 building technology teachers in technical colleges. Structure questionnaire was used as instruments for data collection. Five research questions and five null hypotheses were formulated. Cronbach alpha method was used for the reliability of the instrument which yielded a coefficient of 0.83. Mean was used to analyze the data for answering research questions while t- test was used to test the hypotheses of no significant difference at 0.05 level of significance. It was found out that: twenty two (22) skills were required for improving Building Technology students'

performance, nine (9) teaching strategies were required for improving skill acquisition among Building Technology students of technical colleges in Ebonyi State, twenty (20) teaching strategies were also required for teaching practical to students of Building Technology of technical colleges, thirteen (13) evaluation strategies were required for evaluating Building Technology students in technical colleges and fourteen (14) ways were required for utilizing building technology production units as strategy for improving skill acquisition of Building Technology students in technical colleges in Ebonyi State.

Promise (2017) designed to ascertain the strategies for enhancing practical skill acquisition among technical college students through the use of ICT for self-reliance in Abia State. The study employed a descriptive survey research design and was carried out in technical colleges in Aba South, Aba North and Ukwa East Local Government Areas of Abia State respectively with a population of 42 respondents (31 male and 11 female technical college teachers). Due to the manageable size of the population, there was no sampling. The instrument for data collection was a structured questionnaire developed by the researchers and validated by three experts while the reliability index of 0.86 was established using Cronbach's Alpha. Two research questions were raised and answered using mean and standard deviation while the null hypotheses formulated were tested using t-test statistics at 0.05 level of significance. Some of the findings include that web search engine can enhance practical skill acquisition to a great extent by providing up to date components information; digital videos can enhance practical skill acquisition among technical college students to a great extent by maintaining students' learning interest and presenting clear pictures of stories to practical. It was therefore recommended that education policy makers and implementers should encourage the use of ICT in teaching practical oriented subjects for professional development of students at technical colleges for self-reliance in Abia State

Adeila (2021) conducted a study to investigate the managerial strategies for enhancing student's skill acquisition in block/brick laying and concreting trades in technical colleges in south - south Nigeria. Four research questions and null hypotheses were formulated and tested at .05 level of significance. The study adopted a descriptive survey design. The population of the study consisted of 84 and 62 block laying and concreting trade teachers and instructors respectively. The entire population was used therefore no sampling was made. The instrument used for the study was a self made questionnaire tagged “Managerial Strategies for Enhancing Students Skills Acquisition in Block Laying and Concreting Trades”. The instrument was validated by two experts. The reliability of the instrument was established using Cronbach Alpha reliability co-efficient which resulted in .81 reliability coefficient. Mean and Standard deviation were used in answering the research questions while z-test was used in testing the hypotheses. This study found that initiating a logical step in facility management, adequate integration of practical's in the curriculum, preparing list of specification necessary for practical, ensuring that tools and equipment are used harmoniously, ensuring a more appropriate functioning training center, maintaining cordial relationship between students and teachers during the programme and carrying out regular inspection during and after practical sections are strategies for enhancing students' skill acquisition in block/bricklaying and concreting trades in south-south Nigeria. It was recommended among others that technical teachers should prepare practical guidelines and list of specifications necessary for practical before any practical activities since it will help in ensuring that practical activities are properly managed.

2.4 Summary of Review of Related Literature

The literature review for the study covers strategies for skill acquisition among students of Building Technology in technical colleges. Concept of skill acquisition and various technical

skills in Building Technology were reviewed in the study. Teaching methods that could be used in teaching building technology to students in technical colleges in order to acquire technical skills were dealt with. Relevant evaluation strategies that can be used by the technical teachers for evaluating practical or technical skills acquired by the students in Building Technology were also described. Among the strategies reviewed in the study include rating scale, checklist, ranking strategies and performance test and process and product evaluation strategies. Various works on Building Technology in Nigerian technical colleges were also reviewed. Skill theory was also explained and shown how it related to the study.

The review also showed that the failure of psycho-productive skill acquisition in technical colleges in Nigeria is mostly blamed on technology teacher's programmes. The technology teachers produced today from various institutions seem not to be prepared for teaching technology courses. The present trend tends to suggest that there is lack of saleable skills acquired by students at the end of their course that can enable them relate what they have learnt to the real world, hence technology teacher programmes tend to be more subjective and theoretical in approach than desired.

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1 Design of the Study

The study will adopt survey research design to determine strategies for improving practical skill acquisition of building technology students in technical colleges in Niger state. Survey design according Nworgu (1991) is aimed at collecting data on and describing in a systematic manner, the characteristics features or facts about a given population. Osuala (2005) said that it is a design which studies the characteristics of people, the vital facts about people and their beliefs, opinions, attitude, motivation and behavior.

3.2 Area of the study

The study will be carried out in six (6) technical colleges in Niger state Nigeria. Niger state falls on the land mass area of about 76,363km², with a population of about 3,950,349 (NPC, 2006).

3.3 Population for the Study

The population for the study consists of 80 respondents comprising 58 building students from the six technical colleges and 22 technical teachers. Below is the population description table:

List of technical colleges in Niger state	No. of building technology students
Government Technical college Eyagi Bida	10
Government technical Minna.	10
Suleiman technical college Suleja	10
Federal Science and technical college Shiroro	10
Government technical college Kontongora	10
Government technical college New-Bussa	8
Total	58

3.4 Sample and Sampling Technique

There will be no sampling because the entire population will be used and the population was manageable.

3.5 Instrument for Data Collection

The instrument for data collection will be a researcher designed structured questionnaire titled "strategies for improving practical skill acquisition of building technology students in technical colleges in Niger state ". The questionnaire will be made up of four sections (A, B, C and D). Section 'A' contains items on personal information of the respondents. Section 'B' seeks Skills required in Building Technology by Building Technology teachers for improving practical skill acquisition of building technology students in technical colleges in Niger state. Section 'C' find out the strategies for teaching practical skills for building technology students in technical colleges in Niger state. Section 'D' find out teaching strategies of Building Technology theory to improve skill acquisition of Building Technology students in technical colleges in Niger state. The questionnaire items were based on four points scale types. Items for section 'B', 'C' and 'D' contain four responses category each. The response categories for section 'B', 'C' and 'D' are strongly Agree (SA), Agree (A), and Disagree (D) and strongly disagree (SD). These response categories will be assign numerical values of 4, 3, 2 and 1 respectively. Respondents were require checking (√) against the response category that best satisfies their opinion.

3.6 Validation of instrument

The instrument will be validated by three lecturers in the department of Industrial and Technology Education, Federal University of Technology, Minna and contributions on the appropriateness of the instrument will be considered in the production of the final copy of the research instrument.

3.7 Reliability of instrument

In order to determine the reliability of the research instrument, a pilot test will be conducted using three technical colleges in Kaduna State. During the test, the questionnaires were distributed by the researcher. The questionnaire was filled by the respondents and then returned to the researcher. The data collected will be analyzed using Crombach Alpha

3.8 Administration of instrument

The instrument that will be used for the data collection was administered to the respondents by the researcher and three research assistant in the study area.

3.9 Method of Data Analysis

Data collected will be analyzed using mean and standard deviation for the research questions while t-test was used to test the hypothesis at the 0.05 level of significant. A four (4) point rating scale was to analyze the data as shown below.

Strongly Agree	(SA)	=	4points (3.5 – 4.0)
Agree	(A)	=	3points (2.5 - 3.49)
Disagree	(D)	=	2points (1.5 – 2.49)
Strongly Disagree	(SD)	=	1point (1.0 – 1.49)

Therefore, the mean value of the 4 point scale is:

$$\bar{X} = \frac{4+3+2+1}{4} = \frac{10}{4} = 2.5$$

3.10 Decision Rule

The cutoff point of the mean score of 2.50 will be chosen as the agreed or disagreed point. This will be interpreted relatively according to the rating point scale adopted for this study. Therefore, an item with response below 2.49 and below was regarded or considered as disagreed while an item with response at 2.5 and above was regarded or considered as agreed.

CHAPTER FOUR

PRESENTATION AND ANALYSIS OF DATA

4.1 Research Question One

What are the Skills required in Building Technology by Building Technology teachers for improving practical skill acquisition of building technology students in technical colleges in Niger state?

Table 4.1: Mean responses of the Building technology students and building technology teachers on the Skills required in Building Technology by Building Technology teachers for improving practical skill acquisition of building technology students in technical colleges in Niger state.

S/N	ITEMS	N ₁ = 58		N ₂ =22
		\bar{X}	SD	Remark
1	Ability to read and interpret Building plans	3.27	.675	Agreed
2	Ability to Choose appropriate foundation for a particular building	3.59	.758	Agreed
3	Ability to Determine correct foundation depth for a particular building	3.14	.882	Agreed
4	Ability to Use simple leveling instruments to determine the level of the building from the road	3.36	.783	Agreed
5	Setting out of building using builder s square or 3:4:5 method	3.21	.774	Agreed
6	excavating concrete foundation correctly	2.96	.863	Agreed
7	Ability to Use pegs to determine the thickness of concrete foundation	3.79	.544	Agreed
8	Mixing of cement, sand and gravel plus water in their right proportion	2.97	1.018	Agreed

9	Ability to use machine mixer to mix concrete	3.58	.671	Agreed
10	Placing concrete on foundation using head pans, wheel barrows or concrete hose	3.64	.601	Agreed
11	Ability to mix concrete manually	3.70	.644	Agreed
12	Ability to choose the right block for the right job	3.67	.671	Agreed
13	Determining correct foundation depth for a particular building	3.74	.545	Agreed
14	Mixing of cement, sand and gravel plus water in their right proportion	3.65	.597	Agreed
15	Using head pan or wheelbarrow for measuring materials	3.61	.646	Agreed
16	Ability of filling in the cross joints to form the wall	3.31	.587	Agreed
17	Ability to plumb block walls using spirit level	3.30	.624	Agreed
18	Using trowel for picking up mortar from the board	3.38	.537	Agreed

N=80

\bar{X} = mean of the respondents

N₁ = building technology students

N₂= building technology teachers

SD = standard deviation of the respondents

Table 4.1 showed that both the Building technology students and building technology teachers agreed on all items from 1 to 18. This is because none of the mean response was below 2.50 which was the beach mark of agreed on the 4-points response options. The standard deviation score ranged between 0.537 and 1.018. This showed that the responses of the Building technology students and building technology teachers on the items were not divergent.

4.2 Research Question Two

What are the Teaching strategies of Building Technology theory to improve skill acquisition of Building Technology students in technical colleges in Niger state?

Table 4.2: mean response of the Building technology students and building technology teachers Teaching strategies of Building Technology theory to improve skill acquisition of Building Technology students in technical colleges in Niger state.

		N ₁ = 58	N ₂ =15		
S/N	ITEMS	\bar{X}	SD	Remark	
1	Allowing students to engage themselves in practicing during the practical classes	3.61	.921	Agreed	
2	Using modem hand tools for teaching during practical	3.44	.898	Agreed	
3	Using well equipped and organized workshop for practicals	3.60	.565	Agreed	
4	Grouping students into small groups during practicals for monitoring	3.65	.553	Agreed	
5	Emphasis should be laid on how to use a particular tool or equipment/machine	2.70	1.400	Agreed	
6	Always inviting building experts from building industries to give lectures to students on practical innovations	2.96	.863	Agreed	
7	Allowing students to handle basic building technology tools during practical	3.79	.544	Agreed	
8	Visiting relevant building industries for cheat skill acquisition (field trip)	2.97	1.018	Agreed	
9	Allowing students to teach themselves the acquired practical skills after the trip	3.58	.671	Agreed	
10	Giving project works or model to students to constructed at the end of each lesson	3.18	1.065	Agreed	
11	Making it compulsory fin Budding Technology students to have their own basic hand tools for	3.70	.644	Agreed	

practical				
12	Providing practical manuals to guide students during practicals	3.04	.818	Agreed
13	Using provided equipment/machines for teaching practicals	3.79	.544	Agreed
14	Allocating more time for practicals than for theory	2.97	1.018	Agreed
15	Assigning more marks to practice's than theory	3.51	.746	Agreed
16	Encouraging students to sketch a 2-bedroom bungalow	3.64	.601	Agreed
17	Engaging students in costing a 2-bedroom bungalow	3.66	.711	Agreed
18	Allowing knowledgeable students to teach colleague practical concepts	3.59	.791	Agreed

N=80

\bar{X} = mean of the respondents

N₁ = building technology students

N₂ = building technology teachers

SD = standard deviation of the respondents

Table 4.2 showed that both the Building technology students and building technology teachers agreed on all items. This was because none of the mean response was below 2.50 which was the bench mark of agreed on the 4-point response options. The standard deviation score ranged between 0.544 and 1.400. This showed that the responses of the Building technology students and building technology teachers on the items were not divergent.

4.3 Research Question Three

What are the Teaching practical strategies of Building Technology that will enhance skill acquisition of Building Technology students in technical colleges in Niger state?

Table 4.3: mean responses of the Building technology students and building technology teachers on the Teaching practical strategies of Building Technology that will enhance skill acquisition of Building Technology students in technical colleges in Niger state.

		N ₁ = 58	N ₂ =22		
S/N	ITEMS	\bar{X}	SD	Remark	
1	Using students centered teaching method for teaching Building Technology	3.61	.515	Agreed	
2	Giving tests or assignments to students at the i end of lessons	3.42	1.111	Agreed	
3	Grouping students to deliberate and find out innovations in Building Technology	3.79	.544	Agreed	
4	Applying reciprocal peer tutoring as teaching strategy for teaching theory In building technology	3.65	.553	Agreed	
5	Visiting relevant building industries for practical skill acquisition (field trip)	2.88	1.296	Agreed	
6	Varying teaching styles. techniques or methods from time to time during lessons	3.04	.818	Agreed	
7	Visiting Building Technology industries at the end terms or session for better understanding of some building concepts	3.79	.544	Agreed	
8	The use gamification method to increase the level of students engagement in the practical skills	2.97	1.018	Agreed	
9	The use of project-based learning (PBL) to build students creative capacity to work through difficult problem	3.51	.746	Agreed	
10	The use of problem-based learning in which students learn about a subject through the experience of solving an open-ended problem	3.64	.601	Agreed	
11	The use of blended learning help in combines online learning and traditional classroom instruction for students to learn skills in their own pace	3.66	.711	Agreed	
12	The use of media literacy helps students to develop	3.41	.706	Agreed	

	critical thinking skills within the context of their existing interests			
13	The use of active learning build students to be actively or experientially during learning process and engaged themselves in problems solving	3.72	.551	Agreed
14	The use growth mind set help students to develop their skills and talents through effort and persistence as well as being receptive to lesson and feedback	3.64	.601	Agreed
15	The use of Culturally responsive teaching method help in aims to link content with student's contemporary and ancestral cultures	3.53	.779	Agreed

N=80

\bar{X} = mean of the respondents

N₁ = building technology students

N₂= building technology teachers

SD = standard deviation of the respondents

Table 4.3 showed that both the Building technology students and building technology teachers agreed on all items from 1 to 15. This was because none of the mean response was below 2.50 which was the bench mark of agreed on the 4-point response options. The standard deviation score ranged between 0.515 and 1.296. This showed that the responses of the Building technology students and building technology teachers on the items were not divergent.

4.4 Hypothesis One

There is no significant difference between the mean responses of Building technology students and building technology teachers on Skills required in Building Technology by Building Technology teachers for improving practical skill acquisition of building technology students in technical colleges in Niger state

Table 4.4 T-test on Skills required in Building Technology by Building Technology teachers for improving practical skill acquisition of building technology students in technical colleges in Niger state.

N₁ = 58 AND N₂ = 22

Respondents	N	X	SD	Df	Tcal	P-value	Remark
Building technology student	58	3.53	.503	78	9.580	0.007	NS
Building technology teachers	22	2.09	.811				

N=80

\bar{X}_1 = mean of site building technology students

\bar{X}_2 = mean of building technology teachers

N₁ = No. of building technology students

N₂ = No. building technology teachers

SD₁ = standard deviation of building technology students

SD₂ = standard deviation of building technology teachers

NS = Not Significant

Table 4.4 showed that there was no significant difference in the responses of Building technology students and building technology teachers on all the items as Skills required in Building Technology by Building Technology teachers for improving practical skill acquisition of building technology students in technical colleges in Niger state; therefore the null hypothesis of no significant difference was upheld at 0.05 level of significance.

4.5 Hypothesis Two

There is no significant difference between the mean responses of Building technology students and building technology teachers on teaching strategies of Building Technology

theory to improve skill acquisition of Building Technology students in technical colleges in Niger state.

Table 4.5 T-test on the teaching strategies of Building Technology theory to improve skill acquisition of Building Technology students in technical colleges in Niger state.

N₁ = 58 AND N₂ = 22

Respondents	N	X	SD	Df	Tcal	P-value	Remark
Building technology student	58	3.52	.569	78	2.178	0.001	NS
Building technology teachers	22	3.82	.501				

N=80

\bar{X}_1 = mean of site building technology students

\bar{X}_2 = mean of building technology teachers

N₁ = No. of building technology students

N₂= No. building technology teachers

SD₁ = standard deviation of building technology students

SD₂ = standard deviation of building technology teachers

NS=Not Significant

Table 4.5 showed that there was no significant difference in the responses of Building technology students and building technology teachers on all the items as teaching strategies of Building Technology theory to improve skill acquisition of Building Technology students in technical colleges in Niger state; therefore the null hypothesis of no significant difference was upheld at 0.05 level of significance.

4.6 Hypothesis Three

There is no significant difference between the mean responses of Building technology students and building technology teachers on teaching practical strategies of Building Technology that will enhance skill acquisition of Building Technology students in technical colleges in Niger state

Table 4.6 T-test on the teaching practical strategies of Building Technology that will enhance skill acquisition of Building Technology students in technical colleges in Niger state.

N₁ = 58 AND N₂ = 22

Respondents	N	X	SD	Df	Tcal	P-value	Remark
Building technology student	58	3.53	.537	78	2.254	0.000	NS
Building technology teachers	22	3.82	.395				

N=80

\bar{X}_1 = mean of site building technology students

\bar{X}_2 = mean of building technology teachers

N₁ = No. of building technology students

N₂ = No. building technology teachers

SD₁ = standard deviation of building technology students

SD₂ = standard deviation of building technology teachers

NS = Not Significant

Table 4.6 showed that there was no significant difference in the responses of Building technology students and building technology teachers on all the items as teaching practical strategies of Building Technology that will enhance skill acquisition of Building Technology

students in technical colleges in Niger state; therefore the null hypothesis of no significant difference was upheld at 0.05 level of significance.

4.7 Findings of the study

The following are the main findings of the study; they are prepared based on the research questions and hypothesis tested.

What are the Skills required in Building Technology by Building Technology teachers for improving practical skill acquisition of building technology students in technical colleges in Niger state?

- Ability to read and interpret Building plans
- Ability to Choose appropriate foundation for a particular building
- Ability to Determine correct foundation depth for a particular building
- Ability to Use simple leveling instruments to determine the level of the building from the road
- Setting out of building using builder s square or 3:4:5 method
- excavating concrete foundation correctly
- Ability to Use pegs to determine the thickness of concrete foundation
- Mixing of cement, sand and gravel plus water in their right proportion
- Ability to use machine mixer to mix concrete
- Placing concrete on foundation using head pans, wheel barrows or concrete hose
- Ability to mix concrete manually
- Ability to choose the right block for the right job
- Determining correct foundation depth for a particular building

- Mixing of cement, sand and gravel plus water in their right proportion
- Using head pan or wheelbarrow for measuring materials
- Ability of filling in the cross joints to form the wall
- Ability to plumb block walls using spirit level
- Using trowel for picking up mortar from the board

What are the Teaching strategies of Building Technology theory to improve skill acquisition of Building Technology students in technical colleges in Niger state?

- Allowing students to engage themselves in practicing during the practical classes
- Using modern hand tools for teaching during practical
- Using well equipped and organized workshop for practicals
- Grouping students into small groups during practicals for monitoring
- Emphasis should be laid on how to use a particular tool or equipment/machine
- Always inviting building experts from building industries to give lectures to students on practical innovations
- Allowing students to handle basic building technology tools during practical
- Visiting relevant building industries for cheat skill acquisition (field trip)
- Allowing students to teach themselves the acquired practical skills after the trip
- Giving project works or model to students to constructed at the end of each lesson
- Making it compulsory fin Budding Technology students to have their own basic hand tools for practical
- Providing practical manuals to guide students during practicals
- Using provided equipment/machines for teaching practicals
- Allocating more time for parcticals than for then
- Assigning more marks to practice's than theory

- Encouraging students to sketch a 2-bedroom bungalow
- Engaging students in costing a 2-bedroom bungalow
- Allowing knowledgeable students to teach colleague practical concepts

What are the Teaching practical strategies of Building Technology that will enhance skill acquisition of Building Technology students in technical colleges in Niger state?

- Using students centered teaching method for teaching Building Technology
- Giving tests or assignments to students at the end of lessons
- Grouping students to deliberate and find out innovations in Building Technology
- Applying reciprocal peer tutoring as teaching strategy for teaching theory In building technology
- Visiting relevant building industries for practical skill acquisition (field trip)
- Varying teaching styles. techniques or methods from time to time during lessons
- Visiting Building Technology industries at the end terms or session for better understanding of some building concepts
- The use gamification method to increase the level of students engagement in the practical skills
- The use of project-based learning (PBL) to build students creative capacity to work through difficult problem
- The use of problem-based learning in which students learn about a subject through the experience of solving an open-ended problem
- The use of blended learning help in combines online learning and traditional classroom instruction for students to learn skills in their own pace
- The use of media literacy helps students to develop critical thinking skills within the context of their existing interests

- The use of active learning build students to be actively or experientially during learning process and engaged themselves in problems solving
- The use growth mind set help students to develop their skills and talents through effort and persistence as well as being receptive to lesson and feedback
- The use of Culturally responsive teaching method help in aims to link content with student's contemporary and ancestral cultures

4.8 Discussion of findings

The result from table 4.1 shows the findings on the Skills required in Building Technology by Building Technology teachers for improving practical skill acquisition of building technology students in technical colleges in Niger state. The findings of the study shows the Ability to read and interpret Building plans, Ability to Choose appropriate foundation for a particular building, Ability to Determine correct foundation depth for a particular building, Ability to Use simple leveling instruments to determine the level of the building from the road, Setting out of building using builder s square or 3:4:5 method, excavating concrete foundation correctly, Ability to Use pegs to determine the thickness of concrete foundation, Mixing of cement, sand and gravel plus water in their right proportion, Ability to use machine mixer to mix concrete, Placing concrete on foundation using head pans, wheel barrows or concrete hose, Ability to mix concrete manually, Ability to choose the right block for the right job, Determining correct foundation depth for a particular building, Mixing of cement, sand and gravel plus water in their right proportion, Using head pan or wheelbarrow for measuring materials, Ability of filling in the cross joints to form the wall, Ability to plumb block walls using spirit level, Using trowel for picking up mortar from the board. The findings of the study is inline with Baber and Janulis (2021) who stated that skill is the ability or dexterity in the use of tools effectively and in an efficient manner. Ibidapo, (2021) also stated that that

different skills are required in the modern workplace which involve the understanding, use and application of various technologies in the workplace.

The result of the hypothesis on the Skills required in Building Technology by Building Technology teachers for improving practical skill acquisition of building technology students in technical colleges in Niger state shows that there was no significant difference in the responses of Building technology students and building technology teachers on all the items as Skills required in Building Technology by Building Technology teachers for improving practical skill acquisition of building technology students in technical colleges in Niger state.

Table 4.2 shows the result of the findings on the Teaching strategies of Building Technology theory to improve skill acquisition of Building Technology students in technical colleges in Niger state. The findings of the study shoes Allowing students to engage themselves in practicing during the practical classes, Using modern hand tools for teaching during practical, Using well equipped and organized workshop for practicals, Grouping students into small groups during practicals for monitoring, Emphasis should be laid on how to use a particular tool or equipment/machine, Always inviting building experts from building industries to give lectures to students on practical innovations, Allowing students to handle basic building technology tools during practical, Visiting relevant building industries for cheat skill acquisition (field trip), Allowing students to teach themselves the acquired practical skills after the trip, Giving project works or model to students to constructed at the end of each lesson, Making it compulsory fin Budding Technology students to have their own basic hand tools for practical, Providing practical manuals to guide students during practicals, Using provided equipment/machines for teaching practicals, Allocating more time for parcticals than for then, Assigning more marks to practice's than theory, Encouraging students to sketch a 2-bedroom bungalow, Engaging students in costing a 2-bedroom bungalow, Allowing

knowledgeable students to teach colleague practical concepts. The findings of the study is inline with Ogbuzuru (2016) noted that students and teachers should be visiting Building Technology industries at the end of each lesson for better understanding of some building concepts, inviting Building Technology personnel from industries to deliver lessons on new innovations in building industry and applying appropriate strategies for teaching building technology concepts.

The result of the hypothesis on the teaching strategies of Building Technology theory to improve skill acquisition of Building Technology students in technical colleges in Niger state shows that there was no significant difference in the responses of Building technology students and building technology teachers on teaching strategies of Building Technology theory to improve skill acquisition of Building Technology students in technical colleges in Niger state

The result from table 4.3 reveal the findings on Teaching practical strategies of Building Technology that will enhance skill acquisition of Building Technology students in technical colleges in Niger state. The findings of the study revealed that Using students centered teaching method for teaching Building Technology, Giving tests or assignments to students at the end of lessons, Grouping students to deliberate and find out innovations in Building Technology, Applying reciprocal peer tutoring as teaching strategy for teaching theory In building technology, Visiting relevant building industries for practical skill acquisition (field trip), Varying teaching styles. techniques or methods from time to time during lessons, Visiting Building Technology industries at the end terms or session for better understanding of some building concepts, The use gamification method to increase the level of students engagement in the practical skills, The use of project-based learning (PBL) to build students creative capacity to work through difficult problem, The use of problem-based learning in

which students learn about a subject through the experience of solving an open-ended problem, The use of blended learning help in combines online learning and traditional classroom instruction for students to learn skills in their own pace, The use of media literacy helps students to develop critical thinking skills within the context of their existing interests, The use of active learning build students to be actively or experientially during learning process and engaged themselves in problems solving, The use growth mind set help students to develop their skills and talents through effort and persistence as well as being receptive to lesson and feedback, The use of Culturally responsive teaching method help in aims to link content with student's contemporary and ancestral cultures. The findings of the study is inline with Ebirim (2016) noted that teaching methods/strategies such as questioning, demonstration, project, experiment, assignment and field trips are appropriate for teaching vocational technical education courses in technical colleges.

The result of the hypothesis on the teaching practical strategies of Building Technology that will enhance skill acquisition of Building Technology students in technical colleges in Niger state shows that there was no significant difference in the responses of Building technology students and building technology teachers on teaching practical strategies of Building Technology that will enhance skill acquisition of Building Technology students in technical colleges in Niger state

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary of the Study

The main focus of this research study was to find out the strategies for improving practical skill acquisition of building technology students in technical colleges in Niger state

Chapter 1 of the study discussed the background of the study, the statement of problem, purpose, significance, scope and the research questions were all stated and discussed for the conduct of this research.

The review of related literature looked into Concept of Skill Acquisition, Building Technology in Technical Colleges, Skill Acquisition in Building Technology in Technical Colleges, Technical and Building Technology Skills in Technical Colleges, Teaching Methods for teaching Building Technology Theories and practical in Technical Colleges, Evaluation Strategies in Technical Colleges. Various views of different authors concerning the topic were harmonized in a comprehensive literature review and empirical studies.

A survey approach was used to developed instrument for the study; the respondents identified as the population of the study were the Building technology students and building technology teachers. The entire respondents were used. A number of 80 questionnaires were administered. The instrument used was analysed using frequency count, and mean scores. The research questions were discussed base on the findings from the responses and results of the instrument used.

Implication of the study and conclusions were also drawn from the findings discussed. Recommendations and suggestions for further study were formulated and stated according to the findings of the study.

5.2 Implication of the Study

The findings of this study had implications for teachers of building technology, curriculum developers and the government. If the skills required by students and teaching and evaluation strategies identified by the study are incorporated into the curriculum of building technology. The teachers will be forced to write relevant materials such as textbooks and handouts in order for students to read and for other teachers. The identified skills, teaching strategies and evaluation will be incorporated into the curriculum of Building Technology by the curriculum planners and developers. In order to teach the identified skills effectively to students, adequate instructional materials must be supplied to schools by the government and employers of Building Technology Graduates. If the teaching and evaluation strategies identified by this study are used in teaching and evaluating students of Building Technology students while in Technical Colleges, it could assist them in acquiring skills for employment after graduation.

5.3 Contribution to Knowledge

This study established the strategies for improving practical skill acquisition of building technology students in technical colleges

5.4 Conclusion

Based on the findings of the study, the following conclusions are drawn:

Building Technology at Technical College level is all about teaching skills to students for employment and wealth creation after graduation. In order for students to acquire these skills, teachers are required to teach relevant skills to students by employing appropriate teaching and evaluation strategies.

5.5 Recommendations

Based on the findings of the study, the following recommendations were made:

1. Workshop and seminars should be organized for Building Technology teachers on current technologies/issues in Building Technology from time to time.
2. Teachers of Building Technology should endeavour to adopt identified teaching and evaluation strategies for training their students.
3. Training equipment, machines and books should be donated to schools offering Building Technology by government and employers of labour in order to teach skills to students.

5.6 Suggestion for Further Study

The following are suggested for further studies:

1. Competency improvement needs of teachers in teaching Building Technology to students in Technical Colleges
2. Similar studies should be carried out in other states on strategies for improving skill acquisition of building technology students in technical colleges, polytechnics and university

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APPENDIX

QUESTIONNAIRE FEDERAL UNIVERSITY OF TECHNOLOGY MINNA, NIGER STATE SCHOOL OF SCIENCE AND TECHNOLOGY EDUCATION DEPARTMENT OF INDUSTRIAL AND TECHNOLOGY EDUCATION A QUESTIONNAIRE FOR BUILDING TECHNOLOGY TEACHERS AND BUILDING TECHNOLOGY STUDENTS ON STRATEGIES FOR IMPROVING PRACTICAL SKILL ACQUISITION OF BUILDING TECHNOLOGY STUDENTS IN TECHNICAL COLLEGES IN NIGER STATE

INTRODUCTION: Please kindly complete this questionnaire by ticking the column that best present 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 the research work.

SECTION A

PERSONAL DATA

Building Technology Teachers:

Building Technology Students:

Note: A four (4) point scale is used to indicate your opinion, tick the options which best describe your agreement as shown below:

Strongly Agree (SA) = 4points

Agree (A) = 3points

Disagree (D) = 2points

Strongly Disagree (SD) = 1points

Section B: what are the Skills required in Building Technology by Building Technology teachers for improving practical skill acquisition of building technology students in technical colleges in Niger state?

S/N	Items	Scales			
		SA	A	D	SD
1	Ability to read and interpret Building plans				
2	Ability to Choose appropriate foundation for a particular building				
3	Ability to Determine correct foundation depth for a particular building				
4	Ability to Use simple leveling instruments to determine the level of the building from the road				
5	Setting out of building using builder's square or 3:4:5 method				
6	Excavating concrete foundation correctly				
7	Ability to Use pegs to determine the thickness of concrete foundation				
8	Mixing of cement, sand and gravel plus water in their right proportion				
9	Ability to use machine mixer to mix concrete				
10	Placing concrete on foundation using head pans, wheel barrows or concrete hose				
11	Ability to mix concrete manually				
12	Ability to choose the right block for the right job				
13	Determining correct foundation depth for a particular building				
14	Mixing of cement, sand and gravel plus water in their right proportion				
15	Using head pan or wheelbarrow for measuring materials				
16	Ability of filling in the cross joints to form the wall				
17	Ability to plumb block walls using spirit level.				
18	Using trowel for picking up mortar from the board				

Section C: What are the strategies for teaching practical skills for building technology students in technical colleges in Niger state?

S/N	Items	Scales			
		SA	A	D	SD
1	Allowing students to engage themselves in practicing during the practicals classes				
2	Using modern hand tools for teaching during practicals				
3	Using well equipped and organized workshop for practicals				
4	Grouping students into small groups during practicals for monitoring				
5	Emphasis should be laid on how to use a particular tool or equipment/machine				
6	Always inviting building experts from building industries to give lectures to students on practical innovations				
7	Allowing students to handle basic building technology tools during practical				
8	Visiting relevant building industries for practical skill acquisition (field trip)				
9	Allowing students to teach themselves the acquired practical skills after the trip				
10	Giving project works or model to students to constructed at the end of each lesson				
11	Making it compulsory for Building Technology students to have their own basic hand tools for practical				
12	Providing practical manuals to guide students during practicals				
13	Using provided equipment/machines for teaching practicals				
14	Allocating more time for practicals than for theory				
15	Assigning more marks to practicals than theory				
16	Encouraging students to sketch a 2-bed room bungalow				
17	Engaging students in costing a 2-bedroom bungalow				

18	Allowing knowledgeable students to teach colleagues practical concepts				
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Section D: what are teaching strategies of Building Technology teachers to improve skill acquisition of Building Technology students in technical colleges in Niger state?

S/N	Skill Items	Scale			
		SA	A	D	SD
1	Using students' centered teaching method for teaching Building Technology				
2	Giving tests or assignments to students at the end of lessons.				
3	Grouping students to deliberate and find out innovations in Building Technology				
4	Applying reciprocal peer tutoring as teaching strategy for teaching theory in building technology				
5	Visiting relevant building industries for practical skill acquisition (field trip)				
6	Varying teaching styles, techniques or methods from time to time during lessons.				
7	Visiting Building Technology industries at the end terms or session for better understanding of some building concepts.				
8	The use gamification method to increase the level of students engagement in the practical skills				
9	The use of project-based learning (PBL) to build students creative capacity to work through difficult problem				
10	The use of problem-based learning in which students learn about a subject through the experience of solving an open-ended problem				
11	The use of blended learning help in combines online learning and traditional classroom instruction for students to learn skills in their own pace				
12	The use of media literacy helps students to develop critical thinking skills within the context of their existing interests				

13	The use of active learning build students to be actively or experientially during learning process and engaged themselves in problems solving.				
14	The use growth mindset help students to develop their skills and talents through effort and persistence, as well as being receptive to lesson and feedback				
15	The use of Culturally responsive teaching method help in aims to link content with student's contemporary and ancestral cultures.				