



# Challenges of Practical Skills Acquisition Among Building Trade Students of Federal Polytechnics in North-Eastern Nigeria

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Article DOI: 10.48028/iiprds/ijirtbas.v7.i1.07

## Abstract

The research investigated some of the Challenges of practical skills acquisition among building trade students of federal polytechnics in north-eastern Nigeria. The philosophy underlining building trade practical skills acquisition is to develop and advance the science, technology, and practice of building production, building surveying, building estimation, building construction, and maintenance of building in all its ramifications. Via this philosophy, graduates of building trade would have been exposed to the practical skills aspects of the trade. Therefore, continual reviews towards improvement of the practical skills acquisition among building trade students is a necessity. One major goal of polytechnic education in Nigeria is the provision of trained manpower in applied sciences, technology and business. Particularly at craft, advanced craft and technician levels. The attainment of this objective depends on the quality of craftsmen produced by the polytechnics in the country. However, some researches by researchers showed that majority of graduates from the polytechnics in Nigeria have great deficiencies in practical skills. Perhaps, this could be major reason why considerable number of the polytechnic graduates could not become self-reliant, which is the ultimate goal of the polytechnic education in the country. It is on this basis that the researcher took decision to embark on research work titled: Challenges of practical skills acquisition among building trade students of federal polytechnics in north-eastern Nigeria. Purposes of the study were raised by the researcher to guide the research work. The findings of the study is of significant benefit to the building trade lecturers and students in the polytechnics, building trade curriculum planners, national board for technical education (NBTE), ministries of education, technical skills acquisition institutions such as the basic engineering skills training (BEST) Centres students, 'parents/guardians, and the society at large; because the research work had reveal some of the challenges of practical skills acquisition among building trade students of the federal polytechnics in north-eastern Nigeria. The review of related literature was based on the research objectives. Research questions, research design, area of the study, population of study, sample and sampling techniques, validation of instrument, reliability of instrument, data collection, and data analysis had formed part of the study. The findings and recommendation of the study were stated there in the text.

**Keywords:** *Challenges, Practical skills acquisition, Building trade students, Federal polytechnics, North-Eastern Nigeria.*

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### **Background of the Study**

Building is the techniques and industry involved in the assembly and erection of structures, primarily those used to provide shelter. Building is almost as old as mankind. The early mankind built with: grasses, tree branches, animal skins, stones, mud among others as reported by the National Board for Technical Education (NBTE, 2011). The philosophy underlining building trade practical skills acquisition programme is to develop and advance the science, technology, and practice of building production, building surveying, building estimation, building construction, and building maintenance in all its ramifications. Via this philosophy, graduates of building trade would have been exposed to both theoretical and practical skills aspects of their professional careers. Therefore, continual reviews towards improvement of the practical skills acquisition among building trade students at all levels are necessary as opined by the Nigerian Institute of Building (NIOB, 2009).

Practical skills acquisition is the ability to learn, or the practice of ways of doing things usually gained via training in schools or apprenticeship. The conditions for practical skills acquisition among students in polytechnics consist of interest, readiness, attitude, and motivation among others; which can arouse, sustain, direct and determine the intensity of efforts, structuring, repeated trails, feedback, provision for transfer, and mental health that will prevent anxiety and disturbing self. In the other view, building trade curriculum at polytechnics level was designed to prepare individuals to acquire practical skills, basic and scientific knowledge and attitudes required as building trade technologists, technicians at sub-professional level. Practical skills acquired in formal school system are viewed as technical skills and at informal level are called apprentice skills (Hall, 2010). Practical skills acquisition in polytechnics focuses on specific trades such as: mechanical technology, building technology, electrical technology, among others which has until recently been associated with the activities of lower social class of people in Nigeria, as a result, it attracted a level of stigma in the past (Abdullahi, 2010). In support of the Statement above, Leaman (2009) explained that the nature of building trade practical skills acquisition as a body of knowledge and process is an aspect of technical education used to bring in modern changes and development in the construction industry in the whole wide world and it justifies new practices of interlacing building trade theories with practical work.

William (2011) stated that among other benefits of practical skills acquisition includes:-

1. Gainful employment and attainment of high level living standards.
2. It improves and upgrades individuals' position in employment opportunities in the societies.
3. It makes an individual self-reliance.
4. It equips Individuals with the capacity that is necessary for change of occupation or procession.

Thus, practical skills acquisition among citizens in Nigeria promotes self-employment and is considered as vital requirement for development. To achieve this purpose, several schemes for skills acquisition were developed in Nigeria, among the major schemes developed were:

1. Saturday theory classes (STC).
2. National open apprenticeship scheme (NOAS).

3. Waste to wealth scheme (WWS).
4. School on wheels scheme (SWS), (Hakeem, 2011).

In Nigeria, practical skills acquisition is run in formal schools such as technical colleges, polytechnics and universities. These institutions are established by the Federal government, State governments and Communities. Persons that successfully acquired skills in different courses in the polytechnic are called technician but politically referred as “Polytechnic Graduate” these days (FRN, 2019). Practical industrial experience is necessary as part of the training programme for polytechnics graduates. However, industrial experience is expected to bear close relationship to classroom/workshop instructions so that the two can complement each other and the polytechnics' teachers should be well trained with minimum of first degree qualification with a period of relevant industrial experience (William, 2011).

With economic advancement and the demand for high levels of productivity and efficiency, polytechnics education has become better appreciated, the labour market has become more specialized and nations are demanding high level of skills at different levels (Ebuike, 2009). Governments and businesses are increasingly investing in the future of polytechnics education through publicity, funding, training, organizations and subsidizing apprenticeship. For these reasons, Federal and state governments in Nigeria have been demonstrating commendable efforts to ensure effectiveness of polytechnics education activities theoretically and practically (Ezewu, 2015). Among such efforts was, the establishment of polytechnics, the provision of more technology equipment, the training of more technology teachers, the provision of more funds to technical education, and the inauguration of a coordinating body known as the National Board for Technical Education (NBTE) among other things listed by confidence restored Nigeria (CRN, 2013). For instance, a candidate offering building trade in polytechnic is expected to be taught subjects like English, physics, chemistry, mathematics, economics, technical drawing, descriptive drawing, introduction to computer, small business management, building drawing and design, walling, flooring, (Garba, 2017).

In view of the statement above, Adegbenjor (2010) is of the opinion that the course contents are designed in such a way as to provide balanced theoretical knowledge and practical skills to its recipients. The author emphasized further that building trade students at the end of their practical skills acquisition programme are expected to be enterprising, self-reliant, and compete favorably with their counterparts in other related studies with specific emphasis on practical skills acquisition and that the attainment of the above standard by the graduates of polytechnics depends largely on the competency of the trade teachers.

### **Statement of the Problem**

One major goal of technical education in Nigerian polytechnics is the provision of trained manpower in applied sciences and technology. Particularly, at craft and advanced craft levels (Akninmoyewa, 2019). However, Olaitan (2011) wrote that majority of building trade graduates from polytechnics in Nigeria have great deficiencies in manipulative skills (practical skills). Perhaps, this could be major reason why considerable number of the graduates could not become self-reliant, which is the ultimate goal of technical education in the polytechnics in the country. In practical skills practical skills acquisition, students' poor performances

could be attributed to many factors. Okorie (2010) noted that effective practical skills acquisition activities in polytechnics depends largely on several factors like functional workshop tools and materials for practical activities, availability of relevant instructional materials and adequacy of competent teachers. These promote students' rate of understanding and subsequent academic achievement. Azikiwe (2015) identified some of the problems to include; lack of funds; lack of trained teachers; lack of consumables materials (e.g. cement, sand, aggregate, timber, nails etc.), and inadequate supply of electricity to operate workshop machines and equipment.

Information on the state of practical skills acquisition in polytechnics in Nigeria in the year 2018 by FRN (2018) highlighted that the polytechnics were faced with many challenges such as:

1. There is a high-level shortage of adequate teaching facilities for practical lessons.
2. Shortage of well-trained technical teachers from universities to teach the students.
3. Polytechnics students were perceived by the society as never to do well students that cannot compete with their counterparts in conventional schools among others.

The results of these studies above by researchers and scholars have identified several problems facing the effectiveness of practical skills acquisition in polytechnics. Taking into cognizance the statements above and the generic of practical skills acquisition in building trade in polytechnics, studies showed that there are under achievements in building trade practical skills acquisition among polytechnics students in Nigeria. This has been attributed to substantial number of challenges, ranging from building trade lessons being theoretical and expository in nature, deficiency in practical skills acquisition and application, students and teachers attitudes and interest, and the influence of stress among others as opined by (Elobuiké, 2016). Hence, the study on Challenges of practical skills acquisition among building trade students of federal polytechnics in north-eastern Nigeria.

### **Purpose of the Study**

The major purpose of the study is to investigate the challenges of practical skills acquisition among building trade students of federal polytechnics in north-eastern Nigeria.

Specifically, the study determined:

1. Adequacy of instructional tools in the workshops for practical skills acquisition in building trade in the federal polytechnics in north-eastern Nigeria.
2. The Methods of instructional strategies used by the teachers for practical skills acquisition in building trade in the federal polytechnics in north-eastern Nigeria.

### **Research Questions**

The following research questions was used to guide the study:

1. To what extent are instructional tools adequate in the workshops for practical skills acquisition in building trade in the federal polytechnics in north-eastern Nigeria?
2. What are the Methods of instructional strategies used by the teachers for practical skills acquisition in building trade in the federal polytechnics in north-eastern Nigeria?

## **Hypotheses**

The null hypotheses stated below was tested using Z-test at 0.05 level of significance.

- Ho<sub>1</sub> There is no significant difference between the mean responses of teachers and students on the adequacy of tools in the workshops for practical skills acquisition in building trade in the federal polytechnics in north-eastern Nigeria.
- Ho<sub>2</sub> There is no significant difference between the mean responses of teachers and students in the Methods of instructional strategies used by the teachers for practical skills acquisition in building trade in the federal polytechnics in north-eastern Nigeria.

## **Significance of the Study**

The findings of the study if published is of significant benefit to:

1. Teachers.
2. Curriculum planners.
3. National board for technical education (NBTE) and ministries of education.
4. Rectors and students.
5. Parents and guardians.

It is beneficial to the building trade teachers because it can assist them to identify the best methods of teaching the trade. This can easily be achieved by choosing an appropriate teaching strategy from the variety of the teaching method that are identified in the study. Building trade curriculum planners can be well informed on how and when to modify the curriculum to suit modern technological changes in the society because the construction techniques of structures are constantly changing with time. Not only the curriculum planners, the national board for technical education (NBTE) and ministries of education can be well informed on the requirements of polytechnics to enhance practical skills acquisition. Such can be achieved by enhancing the practical skills acquisition: - tools, materials, machines as well as programmes in the country as a whole.

Rectors of polytechnics and their students, the building trade specialist in particular, can be made to understand the worth of what they have and what they lack for practical exercises, hence effective management of practical tools, materials, and equipment at their disposal. On the other hand, Students' parents and guardians can be enlightened on the direction their children are heading to concerning practical skills acquisition in building trade, their children attitudes, and interest towards practical learning of the trade can be known and suggested ways for enhancement may be adopted. The issues of unemployment and crime commitment in the society as a whole can be reduced.

## **Literature Review**

In view of practical skills acquisition, Ezewu (2015) explained that from generation to generation in Africa, learning by doing was the traditional way of imparting knowledge and skills among Africans. In support to the above assertion, Onwuchekwa (2015) is of the view that Learning by doing is essential to learning and retention of skills. It improves the quality of performance. It is believed that one practices what one learns, and abilities once developed needs to be kept alive through constant practice if these abilities (skills / knowledge) are not to

be lost. Based on this views, the researcher had hinged the study on the experimental learning theory by Kalb, (2014). The theory stated that: technical education is effective in proportion as it trains the individual directly and specifically in the thinking habits and the manipulative habits required in a trade. The aforementioned theory stressed the importance of: workshops, instructional materials, and trained teachers among others for the effective practical skills acquisition in technical trade such as building trade in the polytechnics.

From the assertion of the foregoing theory above, it is absolutely clear that for effective practical skills acquisition in building trade in the polytechnics to take place effectively, there must be room for practical work which is essential in the acquisition of the skills, and this can only be carried out when there are suitable and conducive learning environment e.g. functional workshops and classrooms, adequate and relevant instructional materials, adequate number of competent teachers of desirable training, attitude, commitment, and experience which can be seen in the teaching styles with the ultimate effects on the learners achievement, interest and motivation. But in situation where these cannot be adequately provided, the realization of practical skills acquisitions in building trade will definitely suffer of problems. It is on this ground that the researcher reviewed appropriate related literature to the objectives of the topic understudy.

#### **The adequacy of tools in the building trade workshops for practical skills acquisition in the polytechnics.**

Tools are very important in the field of practical skills acquisition in polytechnic education, particularly in the building trade which emphasized more of practical skills acquisition in place of theory. The significance of tools in the area of practical skills acquisition in technical trades learning processes, especially in building trade, cannot be over emphasized as revealed in number of studies by different researchers, authors, and regulating bodies. For instance, NBTE (2011) wrote that items of schools tools are essential aids to effective teaching/learning of professions in technical institutions. According to the report, the school tools are the teachers, trade tools, and workshops. An institution that is lacking in essential school workshop tools cannot be reasonably expected to achieve its main objectives. Learning by doing is essential to learning and retention of what is learnt. It improves the quality of performance. In support to the significance of practical skills acquisition, Olaitan (2011) is of the view that learning by doing or practical works are in conformity with the Chinese saying that: - "If I hear it, I forget it, if I see it I remember it, but if I do it I know it." Using tools for practical work is essential for the acquisition of practical skills and can best achieved when there are adequate tools for use in the workshops. But this has not been the case in Nigeria, e.g. in the polytechnics. Therefore, students are unable to acquire adequate practical skills required for entry in to the labour market.

Tolman (2009) narrated that most of the instructional tools in the polytechnics are obsolete and others inferior and that much has not been done in updating the instructional tools, besides; there is general lacking of software and other essentials instructional tools in the polytechnics. Instructional tools and materials that can be used to achieve effective practical skills acquisition in building trade workshop and classroom include but not limited to:

1. Overhead projectors.
2. Computers.
3. Calculators.
4. Smart phones.
5. Smart boards (both on and offline).
6. Digital cameras.
7. Machines.
8. Interactive white boards.
9. LCD projectors.
10. ICT equipment- amplifiers, microphones, and loud speakers (in large size workshops).
11. Functional workshops.
12. Cement, timber, fine aggregate, coarse aggregate, water.
13. Concrete mixers/ concrete mixing platforms, gauge boxes, and many more.
14. Tools such as: towels, spirit levels, builder's squares, lines among others.

**Methods of instructional strategies used by the teachers in building trade, for practical skills acquisition in the polytechnics.**

Obviously, building trade is highly structured technical trade, because whatever is to learn at higher level is dependent on what was learnt at lower level as explained by (Uyanga, 2013). Okoye (2013) highlighted that experiences and researches had shown that curricula in building trade at lower level are not properly completed by the end of every semester and that even the completed portions were hardly or not understood properly by majority of the trade students. Leaman (2009) wrote that great attention needs to be given to the neglected aspects in the teachers' presentations of practical lessons, furthermore, teachers present of their subject matter during practical lessons in the workshop is sometimes not acceptable in the teaching profession. Its basis was built in the belief that the personality of these teachers made them behave in particular way while speaking or teaching. This in turn often affects the quality of their presentations, especially in the case of the teachers who were concerned with teaching of practical skills. Contributing on the issue, Offorma (2015) stated that there are some basic mannerism problems exhibited by some building trade teachers that were identified through physical observation and research studies. These mannerism problems include: Pacing up and down the classroom, toying with some materials, and irrelevant speech during lesson presentation among others. The author further explained that the use of proper methods of instructional strategies is the solution to the said mannerism problems.

In support to the use of rightful instructional method for practical skills acquisition among building trade students in the polytechnics, Ukairo (2011) identified the following instructional methods that can be adapted to teach building trades in both theory and practice among which the teachers should select the most appropriate:

I). Lecture/guest lecture methods: In the lecture method the teacher or some other knowledgeable person supplies the information to the students, there is very little students' participation. Students are merely required to listen, think about what they hear, and if

possible understand information being given. The lecture/guest lecture method has only limited use in teaching technical trade. In this method, experts in building trade are invited to give talks to students, e.g. a builder for construction site safety. The method provides varieties to the teaching situation and stimulate the interest of students. Students have opportunities to interact with people who are actually professionals in building trade. Students may obtain valuable information which they could not obtain from books or even from their teachers. Teachers of building trade should resist the temptation to give lengthy lectures since such lectures are usually dull and are incapable of stimulating and sustaining the interest of students. The method, however, has its use in large classes, in advanced courses and when lot of building trade information is to be passed on to students.

II). Tolman (2009) wrote that discussion methods of teaching are usually classified into three which include: class or large group discussion, small group discussion and panel discussion. In large group discussion, all the students in class may discuss a topic under the guidance and direction of the teacher. The teacher starts the discussion by stating the topic that is to be discussed. He/she will then ask the students to make relevant comments or provide solutions to the problems posed. As many students as possible should be allowed to speak before the teacher summarizes the option expressed. A large group discussion may be either formal or informal. In a formal discussion session, the normal classroom arrangement may be changed. Chairs may be arranged in semi-circular fashion so that every student will feel part of the group. A discussion approach session is formal if the teacher has deliberately chosen discussion ahead of time. An informal discussion session is one that is not planned ahead of time. In the process of delivering lecture or outlining project, problem may arise that may need to be discussed by students. Such discussion sessions serve to complement other teaching methods already being adapted. For some discussion topics, it is helpful to divide the class into small groups. Each group handles an aspect of the topic, summarizes its conclusions and later presents its findings to the class. Small group discussions are usually formal discussions since they are planned ahead of time and may involve disruption of the usual classroom sitting arrangement. Panel discussion entails using a panel of discussants made up of students. The panel sits in the front of the class and discusses the topic at hand to the hearing of the entire class. The teacher must decide on the size of the panel and the length of time the discussion should last. A member of the panel may be appointed to act as the leader of the panel and to co-ordinate the discussion.

III). Tribble (2009) is of the view that questioning method can also be used and normally starts at the beginning of the lesson in the classroom by the teacher. The teacher reviews previous work and ask questions to determine whether students have fully comprehended the previous lesson. If the previous lesson had not been fully understood some amount of re-teaching may have to be done. Questioning can also be used in the process of presenting new lesson. Its function would be to increase the students' participation and ensure that the students understood what the teacher says. Questioning may be used to introduce new topic, seek solution to problems or draw students' attention to some important points in the construction of a project or the carrying out of an experiment. Questions should be carefully constructed so that each question can elicit the desired answer. Questions should not merely



require “Yes” or “No” answer. Good questions should require students to “Explain”, “Describe”, and “Identify” or find solutions to problems. When the correct answer to a question has been provided by a student, the teacher should complement the student and restate the answer for the benefit of other students. Where an answer is only partially right, the teacher should indicate the right portion of the answer and then ask the question in another way to see whether a correct response could give a better answer. If no student is able to respond correctly to a question, it could be that the question was not properly worded or that the topic dealt with had not been understood by the students. The teacher should ask the question in another way to see whether a correct response could be obtained. If a correct answer is neither still nor forth-coming the teacher should provide the answer by himself. Questions asked by students should be re-directed back to the students. Students learn more when they supply answers to questions rather than when the answers were supplied to the students by the teacher. Questions asked by one student can be answered by another student. This increases the involvement of students and make the lesson more interesting and affective. Some students may be so dull or lack confidence to such an extent that they never respond to questions. If questions are answered only by few brilliant students, the advantage of questions cannot be realized. The teacher should ensure that his questions are fairly and widely distributed. Shy and dull students should be encouraged to participate in the lesson by answering questions. The teacher should commend any effort made by dull student.

IV). Aliozor (2012) maintained that demonstration is an essential teaching method of trade skills practically or theoretically. For demonstration method of teaching to be effective, the following should be in place:

1. Plan for the demonstration.
2. Preparation of students for the demonstration.
3. Proper implementation of the demonstration.
4. Revision of the important points in the demonstration processes.

Planning demonstration method of teaching trade skills involve determining what is to be demonstrated, determining whether demonstration is at all necessary, having the tools and equipment required for the demonstration and the stage in the teaching process when the demonstration is to be carried out. As part of planning, the teacher should ensure that the tools and equipment required for the demonstration are in good working condition and can be operated by the teacher. Poor demonstration can easily ruin an otherwise good lesson. Finally, the teacher should identify the specific things that students are supposed to learn from the demonstration and which should be emphasized during the demonstration. The teacher should prepare the students for the demonstration just before the demonstration starts. Students should be informed about the purpose of the demonstration and the things they are to observe during the demonstration exercise. If a complex machine is used in the demonstration, students may be told the various parts of the machine and how it is operated. In carrying out the demonstration, the teacher should proceed gradually, explaining each step or process to the students so that they can fully understand what the teacher does. If there are safety measures that must be adapted or occurrences that students are to watch out for, such phenomenon should be stressed. After the demonstration, the major points in the

demonstration should be reviewed. A summary of the procedure adapted in the demonstration should be given as well as the outcome or results of the demonstration. If the expected result was not obtained from the demonstration, the teacher should state so, and also state why it was not obtained. The teacher's demonstration could be followed by demonstration by one of the brilliant students while the teacher watches to correct errors that might be made. A demonstration could be given to a whole class or to part of the class. Where the number of students in a class is large, a small group demonstration is preferred. If a demonstration is given to a large class, some of the students in the class may not be able to see clearly what the teacher is doing. Demonstrations are indispensable in technical education because students have to be taught the correct methods for operating tools, equipment, and machines. Demonstration method of instructional strategy however, have the disadvantage that it is time consuming and may require expensive equipment, tool, machine, or material.

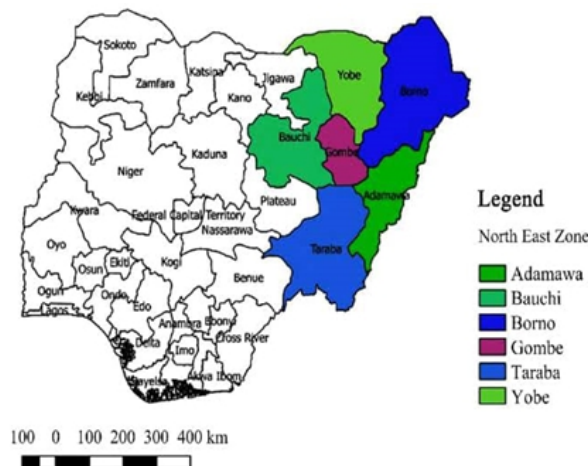
V). Ivowi (2017) opined that project method is also used as method of instructional strategy. A project may be assigned to group or individual. In the project method, students are not usually told exactly what to do, but they are expected to participate in the planning of the intended project. In planning a project, students may have to list the major steps in doing the project, make needed sketches, list the tools, equipment, and materials required and state the procedure to be adapted in the assembly of the project. The construction of a project requires the students to apply the knowledge and skill learnt in the course, especially during practical work. The teacher guides the students and provides assistance whenever it is required. Projects enable students to make practical use of the equipment available in the workshop. It consolidates students' knowledge of theoretical information and helps students to develop practical skills. Project method allows for the individualization of instruction. When students are engaged in individual project, each student will be able to work at own rate and receives any necessary assistance from the teacher. VI). On the other hand, Onwucheka (2015) explained that experimental method is occasionally used in teaching trade skills. Although, experiments according to the author, are only useful in construction and/or power mechanics. In an experiment, students are told what to do and are required to note and record their observations. Experiments assist students to learn because it enables them to verify rules, relationships, and laws.

Publication by UNESCO (2018) regarding building trade practical skills acquisition instructional method strategies, showed that assignment method is the best because it can be performed in the classroom, workshop or at home and may involve written or practical work. In workshop assignment, students can be required to carry out process, or use equipment. Assignment may be written on the white board or typed and handed to students in the form of assignment sheets. Home assignment may require students to consult specific books, reference materials, carry out study, or write report. Assignment may require students to visit institutions and industries in order to learn more about topics covered in classroom. Home assignment may involve the collection of objects, make drawings, or construction of projects. VII). Ivowi (2017) emphasized that field trip method enables students to study industrial practical skills acquisition processes first-hand by seeing the relevance of workshop practically in the manufacturing processes of the industry. The author explained further that

before students are taken on field trip, they should be told the purpose of the field trip, what they are supposed to observe and what they are expected to learn. After the field trip, the teacher should review with the students the experiences of the trip and the various things learnt. This makes the field trip a learning experience rather than mere site-seeing. If particular industrial establishment is to be visited, it is proper to write to the manager or chairman of the establishment to inform him/her of the intended visit. This ensures that an employee of the establishment will be at hand to receive the students and take them round the establishment. After the visit, it is proper to write and thank the management of the industry for providing students with the opportunity to observe the manufacturing processes of the industry.

### Materials and Methods

The study employed descriptive survey research design. This enabled the researcher to use questionnaire during fieldwork. North-eastern Nigeria is the area of the study. North-eastern Nigeria comprises of: Adamawa, Bauchi, Borno, Gombe, Taraba, and Yobe States. North eastern Nigeria is the largest geopolitical zone in the country, covering nearly one-third of Nigeria's total land area. It lies between latitude  $11^{\circ}32'$  and  $11^{\circ}4'$  north, and longitude  $13^{\circ}32'$  and  $13^{\circ}25'$  east. The zone is primarily divided between the semi-desert Sahelian savanna and the tropical west Sudanian savanna ecoregions. Specifically, the study area is all accredited federal polytechnics in north-eastern Nigeria. The region has population of about 26 million people, around 12% of the total population of the country as indicated by the 2006 population census. It is sharing borders outside Nigeria with: Chad republic, Cameroun republic, and Niger republic; inside Nigeria, it is sharing borders with: Benue state, Nasarawa state, Plateau state, Kaduna state, Kano state, and Jigawa state. Maiduguri and Bauchi states are the most populous cities in north-eastern Nigeria as well as the fifteenth and seventeenth most populous cities in Nigeria respectively. Other large north-eastern Nigeria cities include (in order by population): Bauchi, Yola, Mubi, Gombe, Jimeta, Potiskum, Jalingo, Gashua, and Bama.



**Figure 1:** Map of Nigeria showing area of the study.

The population of the study was 140 respondents drawn from the specific areas of the study in north-eastern Nigeria. There was no sampling because the entire population was used for the study. Structured questionnaire known as: challenges of practical skills acquisition among building trade students of federal polytechnics in north-eastern Nigeria, developed by the researcher on five point Likert scale provided by Spiegel in Omozokpia (2001), was used to collect data from the respondents by the researcher. The instrument was presented to two building trade expert in the department of building technology, Kaduna Polytechnic, Kaduna for content and face validation. These validates were requested to assess the instrument in terms of the clarity of the language, appropriateness of the items and the general setting of the instrument. The views and suggestions of these validates were reflected in the instrument to enhance its quality. A test-retest reliability test was carried out on teachers and students of the department of building technology, Hussaini Adamu federal polytechnic, kazaure. Jigawa state. Cronbach Alpha reliability test was used to establish the reliability. The researcher personally administered the instrument of the study to the respondents. The administration of the instrument by the researcher was done within four weeks. 140 questionnaires were distributed to the respondents, however, only 110 questionnaires was retrieved. The data collected, was analysed using mean and standard deviation with the aid of statistical package and service solution (SPSS). SPSS was preferred because it is very systematic and covers wide range of the most common statistical and graphical data analysis. The mean and standard deviation was used to analyse the research questions, while Z-test was used to test the hypothesis at 0.05 level of significance. Z-test was used for the study because the sample size for the study is more than 30. For the purpose of interpretation and decision-making, the concept of cut-off point was adopted. Any mean score that was 3.0 and above was considered valid, i.e. adequate. Conversely, any mean score of less than 3.0 was considered not valid, i.e. not adequate, because it is the real mean of the five points likert scale adopted for the study.

## **Results and Discussion**

### **Research question 1**

To what extent are instructional tools adequate in the workshops for practical skills acquisition in building trade in the federal polytechnics in north-eastern Nigeria?

Data for answering research question 1 is tabulated on table 1 below.

**Table 1:** The extent to which instructional tools are adequate in the workshops for practical skills acquisition in building trade in the federal polytechnics in north-eastern Nigeria.

S/N	Items	Mean	Stand. Dev.	Remark
1	The adequacy of levelling tools in the workshops	2.55	1.178	Not Adequate
2	The adequacy of measuring tools in the workshops	3.20	1.284	Adequate
3	The adequacy of pincers in the workshops	3.03	1.417	Adequate
4	The adequacy of diggers in the workshops	3.03	1.468	Adequate
5	The adequacy of trowels in the workshops	3.31	1.464	Adequate
6	The adequacy of lines in the workshops	3.23	1.366	Adequate
7	The adequacy of spirit levels in the workshops	3.43	1.364	Adequate
8	The adequacy of hammers in the workshops	3.37	1.374	Adequate
9	The adequacy of shovels in the workshops	3.32	1.414	Adequate
10	The adequacy of builder's squares in the workshops	3.28	1.362	Adequate
	<b>Grand Mean (GM)</b>	<b>3.17</b>	<b>1.69</b>	<b>Adequate</b>

Table 1 above shows the level of the adequacy of instructional tools in the workshops for practical skills acquisition in building trade in the federal polytechnics in north-eastern Nigeria. The table shows that the adequacy of spirit levels in the workshops has the highest mean ( $M = 3.43$ ,  $SD = 1.36$ ), the standard deviation is slightly close to the mean which implies that the response slightly varies away from the mean, thus, spirit levels in the workshops are adequate. The next item with the second highest mean ( $M = 3.37$ ,  $SD = 1.37$ ), the standard deviation is close to the mean which implies that the response slightly varies away from the mean, shows that hammers in the workshops are adequate. The next item with the highest mean ( $M = 3.32$ ,  $SD = 1.41$ ), the standard deviation is close to the mean which implies that the response slightly varies away from the mean, shows that shovels in the workshops are adequate. The next item with the highest mean ( $M = 3.31$ ,  $SD = 1.46$ ), the standard deviation is close to the mean which implies that the response slightly varies away from the mean, shows that trowels in the workshops are adequate. The next item with the highest mean ( $M = 3.28$ ,  $SD = 1.36$ ), the standard deviation is close to the mean which implies that the response slightly varies away from the mean, shows that builder's squares in the workshops are adequate. The next item with the highest mean ( $M = 3.23$ ,  $SD = 1.37$ ), the standard deviation is close to the mean which implies that the response slightly varies away from the mean, shows that lines in the workshops are adequate. The next item with the highest mean ( $M = 3.20$ ,  $SD = 1.28$ ), the standard deviation is close to the mean which implies that the responses slightly varies away

from the mean, shows that measuring tools in the workshops are adequate. The next item with the highest mean ( $M = 3.03$ ,  $SD = 1.47$ ), the standard deviation is close to the mean which implies that the responses slightly varies away from the mean, shows that diggers in the workshops are adequate. While another item with the mean ( $M = 3.03$ ,  $SD = 1.42$ ), the standard deviation is close to the mean which implies that the responses slightly varies away from the mean, shows that pincers in the workshops are adequate. And the item with the least mean ( $M = 2.55$ ,  $SD = 1.18$ ), the standard deviation is close to the mean, which implies that the responses slightly varies away from the mean, shows that there is inadequate levelling tools in the workshops. In the end, the table shows that the grand mean of all the items is ( $GM = 3.17$  and  $SD = 1.69$ ) the standard deviation is close to the mean which implies that the response slightly varies away from the mean, which means that instructional tools in the workshops for practical skills acquisition in building trade in the federal polytechnics in north-eastern Nigeria are adequate.

### Hypothesis 1

The null hypotheses stated below was tested using Z-test at 5% level of significance.

$H_{o_1}$  There is no significant difference between the mean responses of teachers and students on the adequacy of tools in the workshops for practical skills acquisition in building trade in the federal polytechnics in north-eastern Nigeria.

To test the hypothesis one, the respondents on the adequacy of instructional tools was analysed using Z-test statistical technique to find out if there was significant difference in the perceptions of teachers and students (Teachers = 37, Students = 73). The result of the analysis is presented in Table 2.

**Table 2:** Summary of Z-test analysis of the responses of teachers and Students on the adequacy of instructional tools.

Source	N	Mean	Mean Differences	SD	Df	Z	Sig. (2-Tailed)
Teachers	37	3.25	1.13	9.48	108	0.70	0.489
Students	73	3.14		7.25			

**Not Significant;  $p > 0.05$ .**

Table 2 reveals that there is no significant difference in the mean responses of teachers and students on the adequacy of instructional tools ( $Z = 0.70$ ,  $df = 108$ ,  $p > 0.05$ ). This implies that there is no significant difference between the mean responses of teachers and students.

### Research Question 2

What are the methods of instructional strategies used by the teachers for practical skills acquisition in building trade in the federal polytechnics in north-eastern Nigeria?

Data for answering research question 2 is tabulated on table 3 below.

**Table 3:** Methods of instructional strategies used by the teachers for practical skills acquisition in building trade in the federal polytechnics in north-eastern Nigeria.

S/N	Items	Mean	Stan, Dev.	Remark
1	Lecture method Utilization	3.55	1.365	Adequate
2	Guest lecture method Utilization	2.93	1.304	Not Adequate
3	Discussion method Utilization	3.40	1.279	Adequate
4	Questioning method Utilization	3.16	1.358	Adequate
5	Demonstration method Utilization	3.20	1.406	Adequate
6	Project method Utilization	2.91	1.450	Not Adequate
7	Experiment method Utilization	3.15	1.394	Adequate
8	Assignment method Utilization	3.35	1.392	Adequate
9	Field trips method Utilization	2.97	1.436	Not Adequate
10	Term paper writing method Utilization	2.79	1.382	Not Adequate
	<b>Grand Mean (GM)</b>	<b>3.14</b>	<b>1.37</b>	<b>Adequate</b>

Table 3 shows the instructional methods used by the teachers for practical skills acquisition in building trade in the federal polytechnics in north-eastern Nigeria. On the table, lecture method utilization has the highest mean ( $M = 3.55$ ,  $SD = 1.37$ ), the standard deviation is close to the mean which implies that the response slightly varies away from the mean, implies that lecture method utilization is adequate. The next item with the second highest mean ( $M = 3.40$ ,  $SD = 1.28$ ), the standard deviation is close to the mean which implies that the response slightly varies away from the mean, shows that discussion method utilization adequate. The next item with the highest mean ( $M = 3.35$ ,  $SD = 1.40$ ), the standard deviation is close to the mean which implies that the response slightly varies away from the mean, shows the assignment method utilization is adequate. The next item with the highest mean ( $M = 3.20$ ,  $SD = 1.41$ ), the standard deviation is close to the mean which implies that the response slightly varies away from the mean, that shows demonstration method utilization is adequate. the next item with the highest mean ( $M = 3.16$ ,  $SD = 1.36$ ) the standard deviation is close to the mean which implies that the response slightly varies away from the mean, shows the questioning method utilization is adequate, the next item with the highest mean ( $M = 3.15$ ,  $SD = 1.40$ ), the standard deviation is close to the mean which implies that the response slightly varies away from the mean, shows the experiment method utilization is adequate, the next item with the highest mean ( $M = 2.97$ ,  $SD = 1.44$ ), the standard deviation is close to the mean which implies that the response slightly varies away from the mean, shows the field trips method utilization is not adequate.

Another item with the mean ( $M = 2.93$ ,  $SD = 1.30$ ), the standard deviation is close to the mean which implies that the response slightly varies away from the mean, shows the guest lecture method utilization is not adequate, while another item with the mean ( $M = 2.91$ ,  $SD = 1.45$ ), the standard deviation is close to the mean which implies that the response slightly varies away from the mean, shows the project method utilization is not adequate. And the item with the least mean ( $M = 2.79$ ,  $SD = 1.38$ ), the standard deviation is close to the mean which implies that the response slightly varies away from the mean, shows the term paper writing method utilization is not adequate. In the end, the table shows that the grand mean of all the items is

(M = 3.14 and SD = 1.37), the standard deviation is close to the mean which implies that the response slightly varies away from the mean, which means that instructional methods used by the teachers for practical skills acquisition in building trade in the federal polytechnics in north-eastern Nigeria is adequate.

### Hypothesis 2

H<sub>02</sub> There is no significant difference between the mean responses of teachers and students in the methods of instructional strategies used by the teachers for practical skills acquisition in building trade in the federal polytechnics in north-eastern Nigeria

To test the hypothesis five, the responses of the respondents on the adequacy of instructional methods was analysed using Z-test statistical technique to find out if there was significant difference in the responses of teachers and students (Teachers = 37, Students = 73). The result of the analysis is presented in Table 4.

**Table 4:** Summary of Z-Test analysis of the responses of teachers and students on the method of instruction used by the teachers.

Source	N	Mean	Mean Differences	SD	df	Z	Sig. (2-Tailed)
Teachers	37	2.81	0.5	8.35	108	-0.30	0.003
Students	73	3.31		8.18			

**Significant; p < 0.05.**

Table 4 reveals that there is a significant difference in the mean responses of teachers and students on the methods of instructional strategies by the teachers for practical skills acquisition in building trade (Z = - 0.30, df = 108, p < 0.05). This implies that there is a significant difference in the mean responses of building trade teachers and students concerning the methods of instructional strategies used by the teachers for practical skills acquisition in building trade in the federal polytechnics in north-eastern Nigeria. The standard deviation implies that the response slightly varies away from the mean, which means that methods of instructional strategies used by the teachers for practical skills acquisition in building trade in the federal polytechnics in north-eastern Nigeria is adequate.

### Findings

1. The level of the adequacy of instructional tools in research question 1 was rated adequate by the respondents, except for item 1 with its mean (M=2.55), standard deviation (SD=1.18) which was rated not adequate for failing to satisfy the cut-off point of 3.0 condition. The level of the adequacy of instructional tools as tested in hypothesis 1 using Z- test at 0.05 level of significance showed (Z = 0.70, df = 108, p > 0.05). This implies that there is no significant difference in mean responses of the variables (Teachers and Students).
2. The methods of instructional strategies used by teachers in research question 2 were adequate; but items number 2, 6, 9, and 10 with mean (M = 2.93, 2.91, 2.97, and 2.79) respectively and standard deviations (SD = 1.30, 1.45, 1.44, and 1.38) respectively did



not satisfy the 3.0 cut-off point, so, they were considered not adequate. The teaching methods used by the teachers as tested in hypothesis 6 using Z-test at 0.05 level of significant indicated that ( $Z = -3.07$ ,  $df = 108$ ,  $p < 0.05$ ). This implied that there is significant difference in the mean responses of the variables.

3. The method of instructional strategy used by teachers in research question 5 were adequate; but items number 2, 6, 9, and 10 with mean ( $M = 2.93, 2.91, 2.97$ , and  $2.79$ ) respectively and standard deviations ( $SD = 1.30, 1.45, 1.44$ , and  $1.38$ ) respectively did not satisfy the 3.0 cut-off point, so, they were considered not adequate. The teaching methods used by the teachers as tested in hypothesis 6 using Z-test at 0.05 level of significant indicated that ( $Z = -3.07$ ,  $df = 108$ ,  $p < 0.05$ ). This implied that there is significant difference in the mean responses of the variables.

### **Conclusion / Recommendations**

The major purpose of the study is to determine the challenges of practical skills acquisition among building trade students of federal polytechnics in north-eastern Nigeria. In order to achieve this purpose, respondents for the study were sort to provide responses to the items on the study instrument. The findings of the study formed the basis to conclude that: Instructional tools in the workshops are adequate, so also methods of instructional strategies used by the teachers are adequate. Based on the findings and conclusions of the study, the following recommendations were made:

1. Provision should be made for levelling tools in the workshops.
2. The following methods of instructional strategies should be utilized by the teachers: Guest lecture method, Project method, Field trips method, and Term paper writing method.

### **Acknowledgements**

All praises and thanks be to Almighty for His merciful guidance and protection experienced all through the periods of conducting the research. Sincere gratitude to TetFund research department for granting me the opportunity to participate in the 2023 research grant. Similar gratitude to the management and committee members of the directorate of research, innovation and development of the federal polytechnic, Mubi Adamawa state, for their assistance to insure quality requirements as demanded by TetFund. E.g. the proper adaption of articles format for

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| 6. Engr. Aliyu Buba Dahiru      | - | - | -Member.                            |
| 7. Engr. Dr. Mohammed Umar Abba | - | - | -M/Secretary.                       |

All references cited have been dully acknowledged. Profound gratitude to all respondents for their sincere responses to the items on the research instrument that lead to the successful completion of the research work.

## References

- Abdullahi, U. (2010). *Perceptions of consultants and contractors on shortage of skilled craftsmen in the construction industry, a case study of selected cities in northern Nigeria*, M.Sc. Thesis, Ahmadu Bello University Zaria, Nigeria.
- Adegbenjo, A. (2010). Skills acquisition promotion through technical and vocational education for realization of vision 2020 in Nigeria, 21 annual conference, *Nigerian association of Teachers of Technology (NATT)*. 11 (3), 11-20.
- Akninmoyewa, J. O. (2019). *Towards effective teaching of vocational and technology education by the year 2020: imperative of vocational and technical education for developing nation*, Oxford: University Press Ltd.
- Azikiwe, O. (2015). *Challenges of effective teaching of vocational and technical education courses in technical colleges and best centres in Nigeria*. Un-published M.tech thesis, federal university of technology Minna in Nigeria.
- Aliozor, C. T. (2012). *Skills acquisition and development in vocational and technical education: Issues, problems, and concerns*. Enugu: BOB billion Publishers, Nigeria.
- Confidence Restored Nigeria (CRN), (2013). *Publication of the independent policy group*. June 28 /2014. University of Lagos, Nigeria.
- Ebuike, M. (2009). Achieving the millennium development goal through vocational and technical education, *Nigerian Journal of Vocational Education*. 6(3), 11-20.
- Elobuike, H. U. (2016). *Principles and methods in vocational and technical education*, Vocational and technical education in Nigeria. University trust Publishers Nsukka.
- Ezewu, E. (2015). *Assessing technical and vocation education in Nigeria*. A foundation for healthy economy, Lagos: lantern books Press Nig. Ltd.
- Federal Republic of Nigeria (FRN, 2019). *National policy on education*, Lagos: Federal ministry of education, Nigeria.
- Garba, E. Y. (2017). Reorganizing the NCE technical programme for effective skills acquisition, *Journal of issues in technical teacher education*. 9(4), 9-20.
- Hakeem, A. A. (2011). Quality in vocational and technical education: Problems and prospects of achieving enhanced human capital development. *Journal of education*. 9 (4), 56-66.

- Hall, A. C. (2010). *Welfare economics and urban problems*. Hutchinson and company Publishers limited, London. [http://memory.loc.gov/frd/cs/ngtoc.htm#Site\\_](http://memory.loc.gov/frd/cs/ngtoc.htm#Site_). Accessed 29<sup>th</sup> August, 2010.
- Ivowi, M. (2017). Vocational and technical education curriculum innovation in Nigeria. *Nigeria Journal of Curriculum Studies*. 11(4), 17-32.
- Kalb, O. (2014). *Experimental learning theories*, Chalampo: Albuquerque Ltd.
- Leaman, A. (2009). *Factors limiting good performance of building professionals in Lagos metropolis*. Un-published M. tech thesis, department of technology education federal university of technology Minna.
- National Board for Technical Education (NBTE, 2011). *Curriculum and module specifications in Blocklaying, Bricklaying and Concreting*. Abuja: Government press td.
- Nigerian Institute of Building (NIOB, 2009). *The professional builder handbook*, Lagos author.
- Offorma, G. C. (2015). *Curriculum implementation for functionality*. Dasylya influence enterprise: Port Harcourt press Ltd.
- Okorie, J. U. (2010). *Infrastructural facilities in institution of vocational and technical education for developing nations*. Owerri: Cape publishers' international ltd.
- Okoye, C. I. (2013). *Research manual in applied science, technology, engineering, medicine and business studies*. University trust publishers Nsukka.
- Olaitan, J. (2011). *Research skill in education and social science*. Owerri: Cape publishers international Ltd.
- Omozokpia, P. A. (2001). Analysis of Constraints Militating against Production Work in Engineering trades, cluster of Technical Colleges in Northern States of Nigeria. *Journal of Engineering Technology and Industrial Applications*, 1 (12 – 16)
- Onwuchekwa, A. K. (2015). Training for skills acquisition at all levels of technology education programme in Nigeria. *Nigerian journal of technology and science*. 9(5), 15-31.
- Tolman, K. (2009). Method of teaching vocational education in Nigeria. *Journal of vocational and technical education (JOVTED)*. 13(3), 12-27.
- Tribble, J. (2009). Methods of teaching vocational and technical education. *Journal of vocational and technical education (JOVTED)*. 10(3), 28-40.

Ukairo, M. U. (2011). Quality of vocational and technical education in Nigeria: Problems and prospects. *Katsina journal of education*. 6(4), 96-106

United Nation Economic Scientific and Cultural Organization and Inland Logistics Organization (UNESCO, 2018). *Building trade skills acquisition method for today*. Paris London press Ltd

Uyanga, O. (2013). *Essentials of environmental impact assessment*. University press Ltd. Ibadan.

William, S. B. (2011). *Vocational education*. [http://en.wikipedia.org/wiki/vocational\\_education](http://en.wikipedia.org/wiki/vocational_education) accessed 22.05.11.