



Study of Teacher Training Need on ICT-based Pedagogy for Teachers of Technical Colleges in Yobe State, Nigeria

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RECOMMENDATION OF BOARD OF EXAMINERS

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It is endorsed that the thesis prepared by Yusuf Dauda Hassan (Student No.171031206) entitled ‘Study of Teacher Training on ICT-based Pedagogy for Teachers’ of Technical Colleges in Yobe State, Nigeria’ has been accepted as fulfilling the part of the requirement for the degree of Master of Science in Technical Education (M.Sc.T.E.) with specialization in Electrical and Electronic Engineering (EEE).

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DECLARATION

I testify that this thesis conducted by me, Yusuf Dauda Hassan, a student of the department of Technical and Vocational Education (TVE), Islamic University of Technology (IUT), Bangladesh. The thesis is an original work and has not been submitted in any form for the award of any degree in any institutions. Other sources used in this study were explicitly acknowledged by citing and referencing.

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DEDICATION

I dedicate my thesis to be loving late father Hassan Dauda and lovely Mother Amina Yusuf Alaraba.

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In the name of Almighty Allah the beneficent the most merciful, before any soul is worth to acknowledge, I will first praise Almighty Allah the creator of all universe, master of the day of judgment who have turned my dream into reality and also make it possible for me to successfully completed this program. I also seek for His guidance throughout my life time.

Special gratitude and appreciation go to my parent who put their effort and help always to me, may Allah forgive their sin and reward them abundantly.

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Table of content

RECOMMENDATION OF BOARD OF EXAMINERS -----	ii
DECLARATION -----	iii
DEDICATION -----	iv
ACKNOWLEDGEMENT -----	v
Table of content-----	vi
List of Table-----	viii
List of Figure-----	ix
ABSTRACT-----	x
CHAPTER ONE INTRODUCTION -----	1
1.1 Background of the Study-----	1
1.2 Statement of the Problem -----	2
1.3 Aims and Objective-----	3
1.4 Research Questions -----	3
1.5 Significance of the Study -----	3
1.6 Scope of the Study -----	4
1.7 Delimitation of the Study -----	4
CHAPTER TWO RELATED LITERATURE REVIEW-----	5
2.1 Access of ICT Resources -----	5
2.2 Teacher’s ICT Pedagogy for Effective Teaching -----	5
2.3 Lack of Skilled Manpower and Inadequate Training -----	6
2.4 Challenges when Using Pedagogy in Teaching -----	7
2.5 Teacher Preparedness and Willingness -----	8
2.6 A Need for Systematic Training -----	10
CHAPTER THREE RESEARCH METHODOLOGY -----	12
3.1 Introduction -----	12
3.2 Research Design -----	12
3.3 Population of the Study -----	12
3.4 Sampling -----	13
3.5 Research Instrument -----	13
3.6 Validation of the Instrument-----	13
3.7 Reliability of Items Questionnaire-----	14

3.8 Method of Data Collection -----	14
3.9 Data Analysis -----	15
3.10 Conclusion-----	16
CHAPTER FOUR Data Analysis -----	17
4.1 Introduction -----	17
4.2 Demography -----	17
4.3 Gender -----	17
4.4 School Names -----	18
4.5 Discipline -----	19
4.7 Access and Usages of ICT-Based Pedagogy and Skills in Teaching and Learning Process -----	22
4.8 Needs of Training on ICT-Based Pedagogy -----	24
4.10 Correlations -----	27
CHAPTER FIVE Discussion, Recommendation and Conclusion-----	29
5.1 Introduction -----	29
5.2 Finding and Discussion -----	29
5.2 Conclusion -----	33
5.3 Recommendation-----	34
5.4 Suggestions for Further Study -----	34
References -----	35
APPENDIX A-----	38
APPENDIX B-----	39

List of Table

Table: 3.1 Population, target, and sample of the study	12
Table: 3.2 Reliability coefficient of the questionnaire items	14
Table: 3.3 Distribution responses and percentages of returned questionnaires.....	15
Table: 3.4 Mean score interpretation of table according to Bingimlas (2017).....	15
Table: 4.1 Descriptive statistics of the collected data	20
Table: 4.2 Weight level of GSTC Teachers' acceptance of access in ICT-based pedagogy integration.....	22
Table: 4.3 Weight level of GSTC Teachers' acceptance of equipment usage, in ICT-based pedagogy.....	23
Table: 4.4 Weight level of technical colleges Teachers' acceptance on challenges facing ICT based pedagogy integration	24
Table: 4.5 Correlation interpretation table of the section items	26
Table: 4.6 Correlation table of the section items questionnaire	27

List of Figure

Figure: 4.1 Gender frequency	17
Figure: 4.2 School names frequency	18
Figure: 4.3 Discipline frequency	19
Figure: 4.4 Histograms of Total access, Total usage and Total challenges	20
Figure: 4.5 Factor levels together of Total access, Total usage and Total challenges	21
Figure: 4.6 a) total access vs usage and (b) Total access vs challenges	26

ABSTRACT

As technologies advancing augment challenges in the global proportion systems mostly education. Teaching as the key role in education, it highly challengeable proportion in this century where facilities rapidly modernize and pedagogy changes swiftly demanding teachers to sandwich by study ways in utilizing them in teaching. Seeing this condition, this study meant to ascertain the level of training needs of ICT-based pedagogy for teachers of technical colleges in Yobe. The study intended to find out existing level of access, usage, and challenges of ICT-based pedagogy in teaching and learning. The study was survey research samples of 160 randomly selected teachers were used as participants for the data collection from different colleges on the study area. The collected data were analyzed to find out level of teachers' capability to apply ICT in teaching. Their effort in integrate pedagogical technology in teaching. The finding revealed that level of technical colleges teachers' ICT accessibility in Yobe is not sufficient enough for teachers' to get hold of the ICT material needed for ICT use in integrating every aspect of school learning to face the ICT challenges of 21st century; Browse/search the internet to collect information to prepare lessons is single item teachers frequently use in teaching; etc. furthermore, The result of analysis can be used as key for enhancing teacher's potentiality in utilization of technology& pedagogy in teaching.

CHAPTER ONE INTRODUCTION

1.1 Background of the Study

The world of work is in continuous change taking ICT modality, eliciting challenges to the workers of 21st century. The needs for pedagogy and ICT specifically, by Technical colleges Teachers cannot be over emphasized; due to elicit in teaching and learning process particularly in the preparation and the presentation of learning contents to the learners. ICT base pedagogy now machinery tool for lead artery in our educational systemsto foster the teaching learning environment. According to Albion Tondeur, Alona, and Jef (2015) “Teachers in the 21st century is facing new challenges as a result of the expanding possibilities of ICT integration in every aspect of the school milieu. Studies have shown the potential of teacher professional development (TPD) that is tailored to local conditions as well as global components and takes advantage of mutual support among teachers, as well as modeling of effective practices” (p655).

Hence curriculum of Nigeria in the 21st century urgently demands teachers to be capable of effectively handling ICT resources for the purpose of helping students (Federal Republic of Nigeria, 2015).Itwill busk teacher’s trainees with the predictable changes by exposing them to brightly apply modern technology other than their traditional method, and widen innovative pedagogy which lead to the effective and successful lessons in the colleges. By and large, to became- ICT-pedagogical literate, there is need for one to acquire certain knowledge and skills required to operate and handle the ICT gadgets required for teaching and learning thereby resulting to an effective instructional delivery.

According to Avidov-ungar-&-IluzI (2014), National programs is the necessary condition as part of the implementation of forthcoming development which teacher’s educators capable to embrace and experiences the real time situation that require the structural planning, innovation, & pedagogical implementation of teaching and learning process. The teacher has been the change agent between the learners and technology, and significantly performed in the process of teaching & learning process. The teacher should apprise- challenges& current opportunities as well as

pedagogical technique in order to convey learners need in global work. The use of computers in our modern society, internet connectivity, interactive white board and other ICT facilities with modern method makes it possible for teachers to simplify abstract concept for learners to understand better.

Nigeria recognized the important of changing to more effective modern method of teaching and teacher training in institution of learning to support and make its citizen to become aware of the need (FRN, 2014). Observably, the technical colleges' teachers of Yobe states depend on the traditional teaching lacking ICT skills & pedagogical technique needed to meet the challenges of 21st century. Teachers in Yobe state are still inclined to traditional methods of teaching which do not produce sound students academically (Ugwu & Ohimekpen, 2015). They require necessary skills & competence to effectively use modern education technique & facilities like ICT in teaching and learning process. Chao (2015) Stated, "Teachers are expected to be well trained and confident in the use of computer-related technology in the classroom and in other professional activities. They need to take education and indeed the world economies to the next level, yet they lack the knowledge, the means and the right attitude to do so"(p78). Accordingly, the research wants to analyze the training need for government technical colleges' teachers on ICT-pedagogy and skill in government science and technical colleges of Yobe state.

1.2 Statement of the Problem

Developmentally, the globe- rapidly become of technology which modernizes various- aspects of human endeavor especially teaching and learning process. This emphasis the training need of teacher in ICT-pedagogy and skills; regardless the program that under go in colleges of education, during their schooling, the certificate they pursue before the service, workshops and in-service training that were attended still teachers are incapable to utilizes ICT in teaching & learning process in their courses taken. The integration of ICT proportional development rate in education activities were slow and practically not hands on with modernize technological gadget that purposefully manufacture for use in education. Furthermore, most of training teachers attended were short course (done in a short period of time), whereby ICT content in most of the teacher training colleges of education were not comprehensive enough for teacher to integrate ICT in teaching at technical colleges. However, it is well known that success and failure of any effort to

use ICT in classroom depend largely on ability of teacher to apply their skill, methodology, knowledge, and competence in using them for effective instructional delivery. Hence, the research study able to identify the stage of ICT acceptance & usage in teaching process, and analyses training need in ICT-pedagogy & skill usage in teaching & learning among teachers of technical colleges. As requested in Federal Republic of Nigeria (2016), teachers must constantly update their knowledge and skills if they are to remain relevant in a rapidly changing world.

1.3 Aims and Objective

The study aims is to investigate the need analysis of ICT-based -pedagogy training for the teachers of Technical Colleges in Yobe State, Nigeria. The specific objectives are to:

1. Identify the teacher's teaching practices related to ICT-based pedagogy
2. Investigate the areas related to ICT-pedagogy that needed improvement for the teachers

1.4 Research Questions

The following research questions were guided to achieve the research objectives:

1. To what extent do teachers use ICT-based pedagogy and skills in teaching and learning process?
2. To what extent do technical college teachers need the training on ICT-based pedagogy

1.5 Significance of the Study

The outcome identified the mode of ICT-based pedagogy training needed that will offer skill improvement of technical college's teachers. The findings also suggest the current ICT-pedagogy and skills of college teachers. This study will help College Administrations putting more concern to stakeholders in increasing a mutual vision for ICT in education, budding many teachers in networks for professional teaching, and nullify the gap sandwiched between- educational research

and practice. It supports teachers to implement pedagogical shapes that are empowered by ICT to engage learners in reliable activity instead of replicating more in traditional practices.

The finding of the studies will help students to move from theoretical phase to implementation phase (hands-on). In view of the fact that empowered teachers deserve high motivation for action, change may be magnify by a need for continuous lifetime learning. In this regard, inspires learners to enlarge their personal knowledge on enhancing ICT-based activities that utilize digital instrument in a sensible decision-making that transforms educational development and work efficiently. And if technical colleges student advance in hands-on technologically, Nigeria will achieve the challenges for the workers of 21st century. According to Ali (2015), “we must realize that the larger Nigerian population is within the age of primary and secondary schools... for a nation to be able to build its capacity through Technical and Vocation Education (TVE) for the realization of Nigeria’s vision 2020, the basic level of education be care/catered for in the mainstream plans, and the implementation be followed up tenaciously”(p.868).

1.6 Scope of the Study

The research study focuses on ICT-based pedagogy needs by technical college’s teachers in Yobe State of Nigeria. It also meant to find out the existing stage of ICT accessibility along with usability while teaching in technical’s colleges of the study area. Moreover, the study meant to identify the challenges of college’s teachers in ICT-based pedagogy integration and recommend some possible ways implement in the teaching-learning environment.

1.7 Delimitation of the Study

Though, there are many post-primary institutions in the state, the study limited to Government Science and Technical School Board (STSB) only STSB coordinating the affairs of government science and technical colleges in Yobe state which was study vicinity are.

CHAPTER TWO

RELATED LITERATURE REVIEW

2.1 Access of ICT Resources

An important influence of ICT-based pedagogy use made of ICT in subject and classes is the amount and assortment of facilities available to the teachers. Inadequate resources in the colleges are a enormous obstruction happen in utilization of technology, for instances, shortage of the computers and software in teaching can seriously hider's teacher use of technology. Many researches have revealed that only a few percentage of the developing countries population has access of he ICT resource (Ali 2015; Khan, Fauzee-&Daud 2016; Oriogu, Ogbuiyi, &Ogbuiyi 2014 and Haji 2017). Where there are limited numbers of computers in technical colleges, it limits their impact, because each individual student is only able to use computer for a few minutes whole class use of an electronic white board has both positive and negative effects. It promotes learners' debate and helps them visualize difficult concepts processes. However, some teachers focus only on the presentation aspect, disregarding the use of stimulation and modeling which might be more challenging in students. The sufficient resource in this research mean the amount of resources presently available and accessible to the technical college's teachers for successfully utilization and development of teaching & learning process.

2.2 Teacher's ICT Pedagogy for Effective Teaching

The concept of ICT-based pedagogy in teaching as vital development mechanism is still recent phenomena in the state. As uncountable research studies have been done regarding ICT skill and equipment in usage teaching (Albion, Tondeur, Alona, and Jef, 2015; Hinostroza, Andrea, Ibieta, Magdalena, & Christian, 2016; Tondeur et. al., 2017; saban2017; Bruno & António, 2018). These in lines with, Hinostroza- et. al., (2016), looking at characterizations of teachers' usability of computers and Internet indoors and outside the classroom need to focus on the quality, found that "teachers report the highest frequency of ICT use inside the classroom in activities where they present contents, give instructions and assign students homework. However, there is evidence that suggests that there is a set of activities that involve the usage of ICT during lesson preparation outside the classroom that seems to be more frequent and that is related to the

activities they ask students to perform” (p1598). Wang et al. (2014), looking at college teachers’ utilization of ICT inside and outside the school, found that teachers use ICT inside the school mainly for preparing curriculum materials, performing administrative work, and communication. According to Albion et. al., (2015), college’s teachers’ professional development for ICT integration are towards a mutual relationship between researches and practice, narrated it provide a simple conceptual map that can be saved as a model in the examination of cases from the field. According to Rosell et al (in Chao,2015),the teachers who have taught five years back, they are used technology to teach more than their senior counterparts because they are just fresh from training and most probably would have received an up to date or more comprehensive ICT training.

The research survey results revealed that the teacher who have working experience for one to five years, though more confident in using technology they used less of it in class and more of it in outside class activities. Though their senior counterparts were less confident in using technology they used more of it for instruction in class (Chao, 2015). Furthermore, Teachers that graduated less than five years are expected with improved skilled and highly impassioned in the usage technology as highly demanded in teaching, though the researches revealed contrary. Did ICT training in their program insufficient? This survey wishes investigate whether such kind of the circumstances happening in Yobe with a mission of finding out ICT integration challenges and possible remedy. This is where the researcher found a gap to be investigated. In this study, the researcher is ought to analyze teacher training need on ICT-pedagogy Integration in technical colleges of Yobe state in Nigeria.

2.3 Lack of Skilled Manpower and Inadequate Training

The pre-service teacher training programs in colleges of education and faculties of education universities provide little opportunity for trainees to learn skills necessary to integrate ICT into teaching. Research has shown that such programs have not sufficiently modeled to integrate technology in their methodology of teaching courses or incorporated effective technique to technology integration into a single technology course (Agyei, 2013). However, an additional problem is limited time that the teacher has for training hence most ICT courses that are organized for the teachers are usually short and not comprehensive adequate amount of. The training

colleges of education ICT content does not prepare the teacher with enough ICT skills to integrate ICT in teaching their subjects in secondary schools (Chao, 2015).

As many studies indicate, example: Haji 2017; Malik, Rohendi, & Widiaty 2019; Saban 2017; Tondeur, Jonh, Peggy, & Anne 2017; and Wilson & Boateng (2014), teacher training colleges had focused more on mastering technological resources which, in turn, had led to a good number of criticisms being made in former studies, which can be categorized into three main aspects:

(a) Lack of training in pedagogical aspects owing to focus on technology,

(b) Poor adaptation of training programmed to teachers' knowledge and skills,

(c) Lack of time to carry out innovations using ICT, along with an inadequate follow-up of their use in the classroom. Based on Federal Republic of Nigeria (2014) personnel must be adequate in number, in quality and in terms of skill-mix. For effective teacher education, personnel must also be well educated, in addition to being appropriately skilled in pedagogy and demonstrable teaching competencies. This signifies the needs for teacher's technology related professional development to effectively integrate ICTs with modernize in their teaching and learning process. ICT integration as a catalyst for educational development can only be achieved through effective training and retraining of teachers on how to use ICTs in teaching and learning. Teachers need retraining not only in computer literacy but also ICT base pedagogy and the application of various kinds of educational software in teaching and learning (Saban, 2017)

2.4 Challenges when Using Pedagogy in Teaching

According to Khan, Fauzee & Daud, (2016), the following are some of the key challenges in teaching:

(1) Acquiring the right individuals to become good pedagogical teachers are a problem because inviting good quality candidates to the teaching profession is vital to develop desirable standards in teaching.

(2) Equipping teachers with the appropriate and right skills are also a challenge. Teachers must be prepared with applicable knowledge and teaching skills that can enhance student achievement by

providing them pertinent guidance. Low down levels of education and weak training are leaving teachers awarding certificates/degrees from teacher training Institution/Universities without the essential subject knowledge and pedagogical skills to provide the paramount conceivable instruction for every student.

(3) Lack of resources in teacher training institutions/Universities is another challenge while discussing quality teacher. It has been observed that teacher training education institutions have often been lack of resources including laboratories, libraries, reading materials, building, and information and communication technology facilities etc. all these affect professional development of teachers.

(4) One of the critical challenges is encouraging teachers to perform their job efficiently and effectively. May reasons are responsible including the lower remuneration/salary regarding teacher motivation and teacher scarcity. Where it had noticed that low levels of income have an unfavorable impact on teachers' personal lives and their competence to do well in their jobs, as most of the teachers seeks elsewhere for part-time teaching to increase their incomes. Unfair distribution of qualified and effective teachers can be another challenge. In numerous countries, on one hand, well-trained teachers prefer to teach in schools located in urban areas where their salaries are relatively high, and they can have amenities.

However, the challenges confronting non-pedagogical teachers are how to implement the presented curriculum in effective way and equipped student with the needed sufficiently skills to perform in a workplace to fit in and to perform effectively in this dynamic, information wealthy, the constantly changing atmosphere.

2.5 Teacher Preparedness and Willingness

Self-efficacy and willingness -have an impact on an individual's psychological, attitude and motivation. Individual teachers with low self-efficacy believe difficult tasks are beyond their capabilities; they are also probable to lose confidence in personal abilities. Attitudes are key determinant in whether teachers accept ICT gadget as a teaching tool in their teaching practices (Bandura in-Olakanmi, 2017). College's teachers when motivated, they must have opportunities

for continuing professional development, advancement and improvement in their career. According to Haji (2017), Teachers are ready to transform ICT base pedagogy in their work, but they do not have the amenities such as fast internet connection which would open the world to leaning through interaction and research activities. The current training of teachers in the ICT is haphazard hence the teacher is not able to fully utilize ICT facilities in cases where such are available. This should be streamlined by the ministry of education. Saban (2017), Identify three conditions that must be satisfied for teachers to be motivated and utilize ICT in their practice:

(1) Teachers must believe that by using technology they are more possibility to achieve a higher-level goal than through other means used ('effectiveness').

(2)They must believe that when used, technology will not disturb the other high-level goals that they needed to achieve ('disturbances').

(3)Finally, teacher must believe that they are in entire control, having the capability and resources to use ICT efficiently ('control'). Having fulfilled the above conditions, there is needed to keep the teachers motivated to use ICTs in their teaching profession. This is especially the case when the modernization involves the use of a certain tool or a technique. Without enough preparation to use the tool or technique, the innovation will die out soon. The research that, one of the reasons for the unenthusiastic response to ICT-based innovation amongst teachers might be that technological knowledge and skills is either missing or lacking in the processes that underpins teachers planning, (Agyei, 2013)

According to Agyei (2013) this view has recently been developed by Mishra and Koehler and Harris, Mishra, and Koehler, who propose that there is a tendency for teachers not to synergize their content and pedagogical knowledge with their technological knowledge, and that this can result in mundane ICT implementation in the classroom. Alongside the need to build up teachers' knowledge and skills, their attitudes towards ICT integration also need to be understood. According to Ramadan, Chen& Hudson (2018), many researchers Said, in today's globe, teachers' skills are an- essential component of the society in order to upgrade students' learning achievements. Meeting the desires of economic development in developing country like Nigeria, who struggles with the late progression in ICT integration in teaching and learning process due to

weaknesses of its implementation efforts, school infrastructure (multimedia, digital learning materials), not having enough qualified teachers and in the absence of educational ICT policies or vision. However, recent studies have shown that a number of significant areas of concern would have to be seriously addressed if teacher education is to contribute meaningfully to achieving the goals of the National policy on Education (FRN, 2015). Thus, its clearly express by literature impasse should much given to teacher willingness & preparation than training on how to use ICT tools.

2.6 A Need for Systematic Training

The word “Training” can refer to sequences of systematic step, planned instructional activities which directed toward acquirement of specific knowledge and skills for the purpose of developing identifying task. According Saban (2017) the training of teachers in ICT shall be defined as a process through which a teacher acquires methodology and skills to use ICT in teaching their subject for better performance. According Chao (2015) Training is required when there is insufficient performance or changes have occurred in the job and therefore employees require new skills to perform the task. For training to be soundly effective it has to be executingsequentially and systematically.

Tondeur, et. al., (2017) aught that Technology-advancing learning experiences have the impending to change teachers’ beliefs focusing more in student-centered, constructivist beliefs, while at the same time, teachers with constructivist beliefs are more likely to adopt technology in student-centered ways within the context of teaching and learning. Federal Republic of Nigeria, (2015) aught that, like all professionals, teachers must constantly update their knowledge and skills if they are to remain relevant in a rapidly changing globe. Despite the training that teachers have received at pre-service and in the in-service training they are still not capable to integrate ICT in the teaching and learning of their subjects.

Indeed they are still can’t modernity ingrate ICT for professional development hence the rate of ICT integration in Education has remained slow and not implement with immense technological tools that have been developed for use in Education (Chao, 2015).As usual, training occur in this sequence: Analysis, Designing, Developing, Implementing, & Evaluation. Chao G.M (2015),

Ague that, “Before teachers are taken for any ICT training, an assessment of their needs is supposed to be done so that the training program is tailored towards meeting those needs. Steps involved in undertaking a training needs analysis are as follows: Clarify the goal, identify the target group, identify the skill set required, determine the current skill level, determine the skill level required, determine the skill gap, develop a training plan including dates, training strategy and resources required” (p80). The reason for conducting a needs analysis is to find the problem, understand the task difficulty so that a solution shall be found (Barbazette in Chao, 2015). By and large, coupled with the progress in modern methods of instruction have emphasized the importance and needs for teachers to be literate in the use of ICT and currently update for effective instructional delivery.

CHAPTER THREE RESEARCH METHODOLOGY

3.1 Introduction

This chapter describes the techniques followed in carrying out the research. It described the research design, research participant, sample and sampling techniques, research instrument, validity of the instrument, reliability of the instrument, method of data collection and data analysis procedure

3.2 Research Design

This study utilizes quantitative strategy of survey research design. Survey was appropriate for this study because it entails investigating population by taken samples from population then generalizes result to entire population. The research influence most popular survey research design in the field of education which is cross sectional research survey. In the cross-sectional survey design, researcher collects information data at single point in time to examining current attitude, beliefs, & practice of teachers.

3.3 Population of the Study

Research population is the targeted people in scope area of survey study. “Population is the Set of all the individuals of interest in a particular study” (Augustine, Daud and Kamaruddin 2018 p5). The population of study contains the entire teachers of government technical colleges of Yobe state. According to Gay, Mills and Airasian (2012), Population is the group of concern to the researcher, the group to which the result of the study will ideally generalize. The target population is appropriate because the research wanted to analyze the training needs in ICT-pedagogy and skills of government technical college’s teachers.

Table: 3.1 Population, target, and sample of the study

Population	Target Population	Sample Size
All technical colleges three educational zone of Yobe State Nigeria.	6 technical colleges, 2 from each of the Yobe state Educational Zone	160 teachers from the three educational zone of Yobe state

3.4 Sampling

The researcher was used stratify sampling technique to get sampled technical colleges from each zone and also to consider girls technical colleges. Ugwu & Ohimekpen, (2015) noted that the three educational zones in Yobe state are namely; Damaturu, Gashua, and Potiskum education zone. Then simple random sampling was used to select the participants so as give each member of the target equal opportunity of being a sample and avoidance of error and bias in sampling. The populations of the technical college's teachers in Yobe state are about 1000 teachers. For this research 160 teachers will be chosen as sample. According to Gayet al., (2012), "If the population size is around 1,500, 20% should be sampled" (p.139).

The technical colleges were selected by the researcher from the state for the study is: Government Science and Technical College Potiskum, Government Science and Technical College Gaidam, Government Girls Science and technical College Potiskum, and Government Science and Technical Collage Gashua, Federal Government Girls College Potiskum, and Government Science and technical College Gujba. Teachers were randomly selected from the above-mentioned technical colleges so that each teacher is given an equal chance of being selected for the study. The sample comprised of both male and female teachers of the selected schools.

3.5 Research Instrument

The instrument use for data collection is questionnaire which has been adapted by researcher from several validated questionnaires such as Ali, (2015); Agrupamento (2015); and -Malik, Rohendi and Widiaty (2018). Thereafter, the survey instrument has been modified to suit the study. It is used as a tool for collection of data or information from respondents of Government technical colleges in three educational zones of Yobe State. It has been designed on five (5) point rating-scales.

3.6 Validation of the Instrument

These questionnaires were adapted from the different sources which have been validated in previous studies. Although, questionnaire was modified for suited this study and were -validated by the expert opinions. Two experts, additionally, were selected from the department of Technical

and Vocational Education (TVE), and one from Computer Science Engineering (CSE), Islamic university of Technology (IUT). Their comments were used in modifying the test items in the questionnaire. A pilot test was- administered to 5 teachers' in Government Science and Technical College Damagum, Yobe State Nigeria. Their responses were conceded in test items questionnaire

3.7 Reliability of Items Questionnaire

The reliability of items was examined by using Cronbach's Alpha which is generally used in educational research to measure the reliability of a set of items. Reliability Coefficient was examined the three main categories of questionnaire items as show in the table: 3.2 below.

Table: 3.2 Reliability coefficient of the questionnaire items

Section	Items	Coefficient
Total access	08	.808
Total usage	10	.819
Total challenges	16	.818
Total	34	.815

The analysis showed that the reliability coefficient for categories which ranged from .808, for total access the value was .819, and for the total usage the value of mean was .815. A value of coefficient that indicates an acceptances level of reliability has generally been .7 or high (Bingimlas, 2017).

3.8 Method of Data Collection

The questionnaire was sent to the participants through email to a colleague in Nigeria who has prior research experience and administered directly to the respondents in the selected schools from which the required data was collected. This procedure was appropriate as it ensured that respondents were accessible which in turn resulted into a high response. 160 questionnaires were sent and 117 of them were successfully returned to the researcher which amounted to 73.2% rate of return. According to Al Mamun (2019), if returned questionnaire more than 60% is acceptable. And David & Alan (2019), "Although a response rate of more than 60% is considered good, less than 50% is common"(p199). Hence, the 70% returning rate of data from the responded participant was enough for data analysis.

Table: 3.3 Distribution responses and percentages of returned questionnaires

S	Name of Schools	No. Issue	No. Returned	% Returned
1	G STC Potiskum	30	20	12.5%
2	G STCGaidam	30	24	15.0%
3	G GSTC Potiskum	30	24	15.0%
4	G STC Gashua	30	23	14.4%
5	F GG C Potiskum	20	12	07.5%
6	G STC Gujba	20	14	08.8%
Total		160	117	73.2%

3.9 Data Analysis

The collected data from the respondents was tabulated in form of frequencies, percentages, descriptive statistic, and correlation. Separate tables were drawn for different sections of the questionnaires each table was followed by its interpretation using statement-wise, category percentage, mean and standard deviation test. SPSS software was used for the quantitative analysis. Percentage, mean and standard deviation was determined and justified. The summary of interpretation was provided in the table. The means score- interpretation was base of on the following range of the cell as show in table below

Table: 3.4 Mean score interpretation of table according to Bingimlas (2017)

Section	Mean Scale	Interpretation
Teachers' knowledge of usages on ICT	1.00-1.79	Not at all extent of access & usage
	1.80-2.59	Low extent acceptances of access & Usage
	2.60-3.39	Moderate extent acceptance of accce & usage
	3.40-4.19	High extent acceptances of access & usage
	4.20-5.00	Extremely extent acceptance of access & usage
Teachers' knowledge of	1.00-1.79	Not at all agree as the challenges
	1.80-2.59	Disagree as the challenges
	2.60-3.39	Moderately agree as the challenges

Challenges on ICT		
	3.40-4.19	Highly agree as the
	4.20-5.00	Extremely agree as the

the table: 3.4 above shows the interpretation of mean where by mean 4.20-5.00 implies that the respondent strongly agrees and their opinions have superior confidence, whereas mean 3.40-4.19 indicates that the respondents agree and their opinion have high confidence, whereas mean 2.60-3.39 indicates that the respondents are moderate either uncertain or disagree and their opinions have low. Hence, whereas mean 1.80-2.59 indicates that the respondents disagree with items and their opinions have are confidences, whereas mean 0.01-1.79 indicate that the respondent extremely disagree, and their opinions have confidence.

3.10 Conclusion

The study population is entire technical college's teachers of Yobe state, where 160 teachers selected as sampled of the study and 117 questionnaires were return successfully. The questionnaires were adapted from the different sources which have been validated in previous studies. Although, the questionnaire was modified for suited this study, reliability of the questionnaire items was examined by using Cronbach's Alpha and data were analyzed in descriptive, & correlation, by used statistical package of social sciences (SPSS).

CHAPTER FOUR

Data Analysis

4.1 Introduction

This chapter comprised the analysis and interpretation of the data collected using statement- wise. Analyses of the data were performed using both descriptive and correlation statistic. Descriptive measure including percentage, means of items, and standard deviation of each item was calculated describe relevant information about research questions.

4.2 Demography

4.3 Gender

The data was collected from 117 respondents drawn by sampling from- technical colleges in Yobe state. The sampled teachers were presented in terms of demographics of respondents, highlighting the groups of teachers. The respondents have, therefore, been categorized according to gender, as the sample consist of both male and female teachers.



Figure: 4.1 Gender frequency

The figure: 4.1 above shows that out of 117 technical college's teachers who responded to the questionnaires 81(78%) were males and 24 (20%) were females and the remaining 2(2%) did not

responded to gender. This showed that there are more male technical college's teachers than females in the study area. This can be attributed to the fact that most of the female students preferred other bodies than technical colleges' which influenced their number in the study area. This can be endorsed to the fact that there is low female enrollment in technical colleges of the study area.

4.4 School Names

The data was collected from six (6) out of nine (9) technical colleges in the study area. The percentage of the composed data responds drawn from sampled schools for each technical college were showed in the figure 2 below

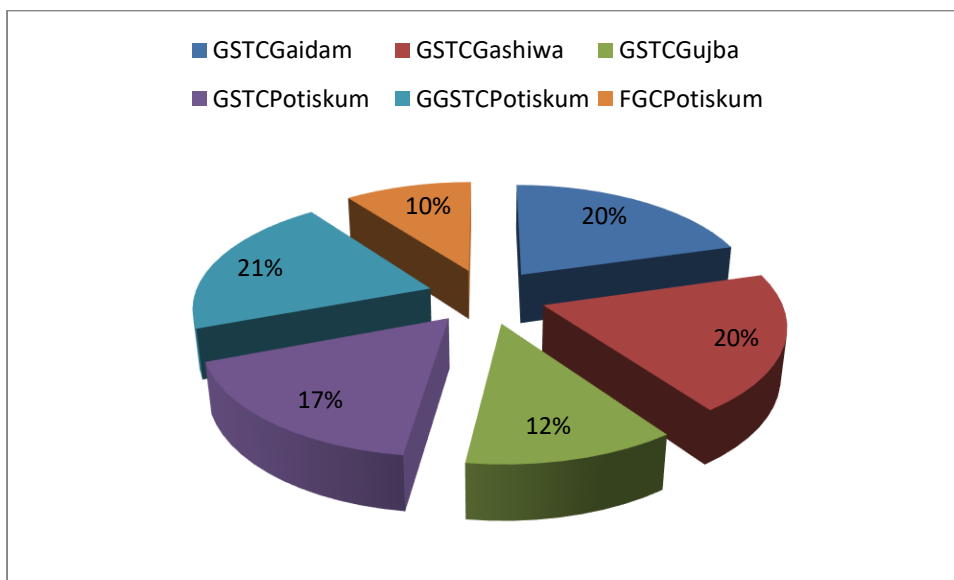


Figure: 4.2 School names frequency

The figure: 4.2 above shows that the 117 data were collected from 6 out 9 technical colleges in the state. The technical college's teachers who responded to the questionnaires 24 (20.5%) were GSTC Gaidam, 24 (20.5%) GGSTC Potiskum, 23 (19.7%) were GSTC Gashua, 20 (17.1%) were GSTC Potiskum, 14 (12.0%) were GSTC Gujba, and 12 (10.2%) were FGGC Potistum respectively. However, GSTC Gaidam and GGSTC Potiskum are highest responded colleges with 20.5% each, while lowest is FGGC Potiskum with 10.2%.

4.5 Discipline

Though, teachers are from many fields of discipline but the participants who responded in the questionnaire are within twelve re-known discipline. The percentage of the composed data responds drawn from sampled colleges, categories for each discipline of technical college's teachers were showed in the figure 4.3 below

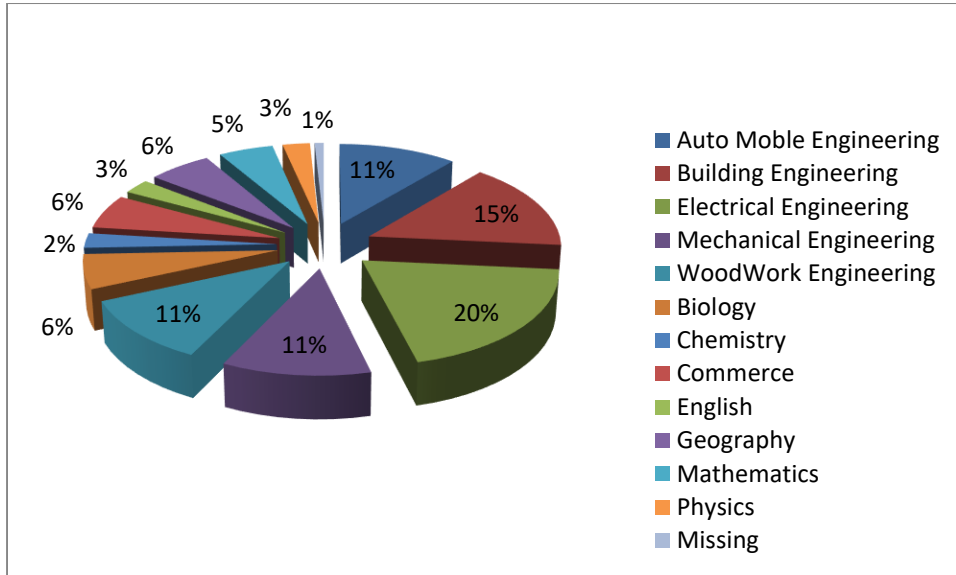


Figure: 4.3 Discipline frequency

As shows in the figure: 4.3 twelve- disciplines were participated in 117 data that were collected from respondent technical college's teachers. Discipline that participated more were Automobile engineering 13 (11.1%), Building (civil) engineering 18 (15.4%), Electrical engineering 23 (19.7%), Mechanical and Woodwork engineering 13 (11.1%) each. Furthermore, the remaining discipline were: Biology, Commerce & Geography 7 (6%) each; Chemistry, English & Physics 3 (2%) each, and lastly Mathematics 8 (6.8%). The highest responded discipline was Electrical engineering while Chemistry, English & Physics 3 (2%) were lowest and one data missing.

4.6 Descriptive Statistic of Need Training on ICT-Based Pedagogy

Table: 4.1 Descriptive statistics of the collected data

N	Minimum	Maximum	Mean	Trimmed Mean 5%	Std. Deviation	Skewness	Kurtosis
Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic
						Std. Error	Std. Error
Total access	8.00	39.00	23.7863	23.7816	7.50153	-.115	.224
Total usage	10.00	46.00	28.2650	28.3229	8.32673	-.191	.224
Total challenges	25.00	80.00	49.9829	50.0323	11.5295	-.035	.224

The table: 4.1 above show that the lowest participant score of total access, total usage, & total challenges are 8, 10 and 25; maximum participant score 39, 46, 80 out of 40, 50, 80 totals score respectively. Differences between Mean and 5% Trimmed Mean are 0.0047, 0.0679, and 0.0494 which show that outliers are negligible. The curves are not perfectly symmetrical or deviated from normal curve. Because normal curve skewness is zero and kurtosis is 0.263 while none of them match with normal curve value.

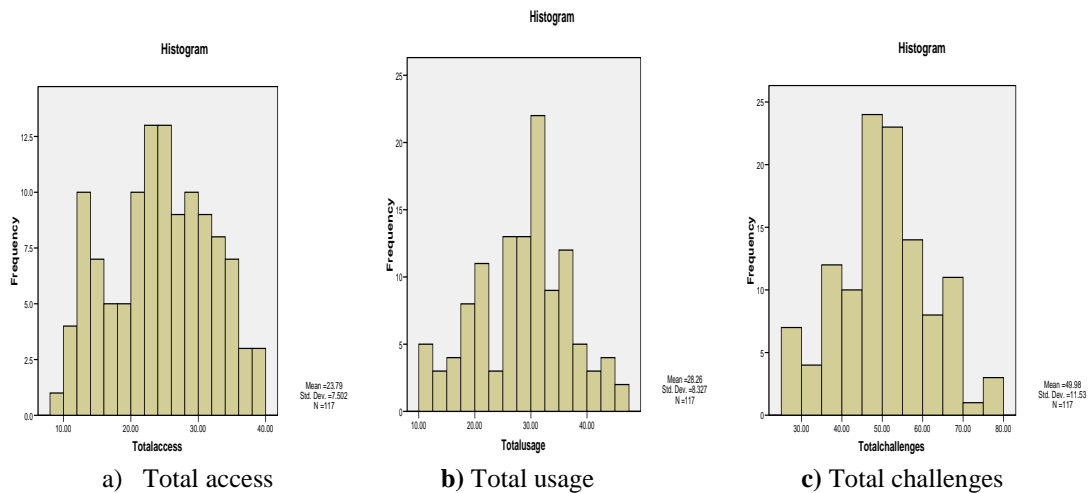


Figure: 4.4 Histograms of Total access, Total usage and Total challenges

The above figures: 4.4 show histograms of total access, usage & challenges respectively. From first figure: 4.4a) histogram incline more in the left; while the second 4.4b) is opposite; and third 4.4c) clearly demonstrates data is approximately equals deviated from mean. Lower side and

upper side information slightly the same, the curve is slightly normal. -While the first 4.4a) is negative skewness & second 4.4b) positive skewness. The positive skewness means most of the response on- usage of ICT based pedagogy is low. And negative skewness means most of the response on access of ICT facilities is high.

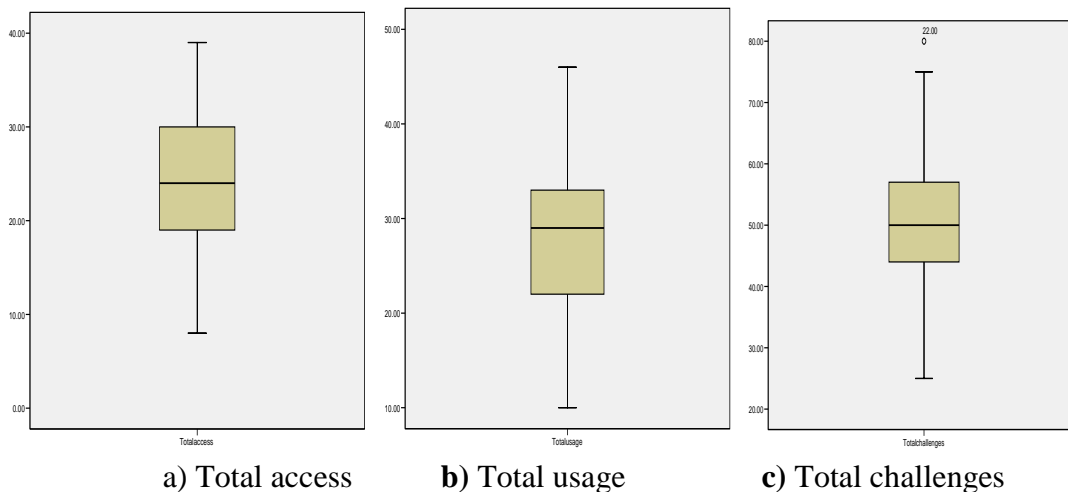


Figure: 4.5 Factor levels together of Total access, Total usage and Total challenges

The figure: 4.5 above show “Factor levels together” of total access, usage & challenges respectively. The first 4.5a) show that 50% data is between 200 & 300; in second 4.5b), 50% between 100 & 200; and in third 4.5c), 50% between 400 & 600. The first two no outliers, means all data concentrate on 50% region. The mean of the data and 5% trimmed mean are the same. The show that the technical college’s teachers responded to the questionnaire items are unique, it indicates the standardization of collected data from the participant and testify the output of the thesis is reflected the opinion, attitude & practices of the entire population in the study area without objection. -Furthermore, third 4.5c) is oppose, 5% trimmed mean cut out some data as an outlier. Some of the participant varying in opinion, they have different extent acceptance on some the questionnaire items. This means some few (5%) are extremely acceptance and/or some few are extremely rejection the items, while 95% commonly accepted the items. This means that the data collected was at 95% confidences level.

4.7 Access and Usages of ICT-Based Pedagogy and Skills in Teaching and Learning Process

The analysis of the study that carried out in descriptive form including the mean and standard deviation of the items, calculated to answer the first question: To what extent do teachers use ICT base pedagogy and skills in teaching and learning process? The research study has comprised the percentage of the participants who rated the items either extremely extent acceptance or high extent acceptance in one column as More extent and the response little extent as well as vary little extent as less extent acceptance in another column. This gives an items clearer measure of the way that the participant's response corresponding to items. As shown in Table: 4.2 below, there are eight items that reflected the participants' access and ten items reflected participants' usage perspective about the ICT equipment in teaching & learning process.

Table: 4.2 Weight level of GSTC Teachers' acceptance of access in ICT-based pedagogy integration

Items	Less extent%	More extent%	Mean	Std. Deviatio	Interpretation
Desktop computers/ Laptop	36.0%	46.1%	3.1282	1.44161	Moderate extent
Internet access (wired/wireless)	42.7%	34.2%	2.8291	1.46388	Moderate extent
Mobile phones provided by the school	28.1%	52.2%	3.3590	1.44115	Moderate extent
Interactive whiteboards	43.6%	35.9%	2.7692	1.46443	Moderate extent
Digital camera or Video recorder	40.2%	30.7%	2.7436	1.38436	Moderate extent
Computer labs	29.9%	53.0%	3.3419	1.39062	Moderate extent
Multimedia Projector	42.7%	40.2%	2.9145	1.51756	Moderate extent
Online Learning Management System (Google Classroom, Moodle etc.)	41.9%	29.0%	2.7009	1.42190	Moderate extent
Overall	20.7%	40.2%	2.9733	1.44069	Moderate extent

The table: 4.2 above, eight (8) item statements identified the ICT equipment possible to access by teachers in teaching and learning process to express their extent in uses ICT-based pedagogy and skills in teaching and learning process in Technical Colleges in Yobe State, Nigeria.

Teachers' acceptance accesses of ICT equipment are at a moderate level, but they have a high access of ICT equipment: Mobile phones provided by the school, Computer labs, and Desktop

computers/ Laptop with means 3.3590, 3.3419 & 3.1282; and extremely extent acceptance or High extent acceptance are: 52.2%, 53.0% and 46.1% respectively. Although Overall mean of Weight level of GSTC Teachers' acceptance of access in ICT-based pedagogy integration in teaching and learning process is 2.9733. It shows that the access of the ICT equipment in their teaching & learning process is at moderate level.

Table: 4.3 Weight level of GSTC Teachers' acceptance of equipment usage, in ICT-based pedagogy

Items	Less extent%	More extent%	Mean	Std. Deviation	Interpretation
Browse/search the internet to collect information to prepare lessons	29.1%	53.8%	3.342	1.3337	Moderate extent
Use Office applications (Word Process Presentation) to prepare lessons	32.5%	35.9%	3.1026	1.32863	Moderate extent
Post homework for students on the school website/ Online learning portal	44.4%	24.8%	2.6410	1.29629	Moderate extent
Use ICT to provide feedback and/or assess students' learning	43.6%	23.9%	2.6410	1.26941	Moderate extent
Communicate with parents through email online	41%	24.8%	2.6410	1.33560	Moderate extent
Use an online learning platform to provide learning materials to students	34.2%	34.2%	2.9573	1.26214	Moderate extent
Use Interactive whiteboards in the classroom	47.9%	29.9%	2.7607	1.43027	Moderate extent
Use Learning Management System (Google Classroom, Moodle etc).	45.2%	24.0%	2.6325	1.32352	Moderate extent
Audio/ Sound device during the classroom teaching	48.7%	23.1%	2.5556	1.32902	Low extent
Multi-Media Projector & Pointer (wireless)	40.1%	40.2%	2.9915	1.56192	Moderate extent
Overall			2.8481	1.34705	Moderate extent

The table: 4.3 above, ten (10) item statements identified the ICT equipment possible to be use by teachers in teaching and learning process to express their extent in uses ICT-based pedagogy and skills in teaching and learning process in Technical Colleges in Yobe State, Nigeria.

Teachers acceptance usage of ICT equipment are at a moderate level, but they have a high usage of the items: Browse/search the internet to collect information to prepare lessons, Use Office applications (Word Processor, Presentation) to prepare lessons with means 3.342, 3.1026 and extremely extent acceptance or High extent acceptance are: 53.8%, and 35.9% respectively. But item 9 which is ‘Audio/ Sound device during the class teaching’ was lowly extent use by teachers. Although Overall mean of Weight level of GSTC Teachers’ acceptance of equipment usage in ICT-based pedagogy integration in teaching and learning process is 2.8481. It shows that the usage of the ICT equipment in their teaching & learning process is at moderate level

4.8 Needs of Training on ICT-Based Pedagogy

The second question is about how often extents of technical college teachers need the training on ICT-based pedagogy. The analysis that conducted in descriptive form including percentages, the mean and standard deviation of the questionnaire items had been calculated to examine the research question. However, as previously state, the percentage of the participants who response the items strongly agree & agree as the highly agree challenges was put in one column and strongly disagree & disagree as less agree as the challenges in integrating ICT-based pedagogy in teaching & learning and process in another column

Table: 4.4 Weight level of technical colleges Teachers’ acceptance on challenges facing ICT based pedagogy integration

Items	Less Agree%	Highly Agree%	Mean	Std. Deviation	Interpretation
Insufficient number of internet-connect computers	32.4%	56.5%	3.3419	1.49229	Moderately agree
Insufficient Internet speed/ bandwidth	34.2%	49.6%	3.2222	1.39031	Moderately agree
Insufficient number of interacti whiteboards	35.9%	53.8%	3.2906	1.42671	Moderately agree
Insufficient number of laptops/ desktops	35.1%	53.8%	3.2735	1.45403	Moderately agree

School computers out of date and/or need repair	32.5%	49.6%	3.3077	1.34844	Moderately agree
Insufficient technical support for teachers	33.4%	52.1%	3.3248	1.37608	Moderately agree
Insufficient ICT training support for teachers	26.7%	60.7%	3.5983	1.30688	Highly agree
Lack of interest to use ICT devices	41.0%	38.5%	2.9487	1.41936	Moderately agree
Fear of Using modern Technology	51.3%	28.2%	2.5897	1.32713	Disagree
Lack of technological hands-on training/courses	36.8%	41.8%	3.1282	1.27670	Moderately agree
Lack of proper policies on using ICT across curriculum	35.9%	46.2%	3.0855	1.34275	Moderately agree
Lack of time to prepare, explore and develop lessons in online	48.1%	35.1%	2.8291	1.45205	Moderately agree
Task related incentives (salary, promotion etc.) provide demotivation to use ICT	32.5%	53.0%	3.2650	1.37961	Moderately agree
Lack of confidence to use ICT devices in teaching	51.3%	34.2%	2.8376	1.39554	Moderately agree
Lack of ICT skills	46.9%	41.1%	2.9316	1.44870	Moderately agree
Lack of Insights of the benefits of using ICT in both short & long term	42.8%	36.7%	3.0085	1.39269	Moderately agree
Overall			3.1239	1.38933	Moderately agree

From the table: 4.4 above, sixteen (16) item statements identified the challenges facing in integrating ICT-based pedagogy in teaching and learning process to express their extent of Challenges confronted in using ICT in teaching learning process in Technical Colleges in Yobe State, Nigeria

The table: 4.4 reveal the participant teachers rating regarding the challenges confronted in using ICT in teaching learning. The top five challenges were reportedly the Insufficient number of internet-connected computers, Insufficient number of interactive whiteboards, Insufficient number of laptops/ desktops, Insufficient technical support for teachers, Insufficient ICT training support for teachers, and Task related incentives (salary, promotion etc.) provide demotivation to use ICT with more 50% Extremely agree or Highly agree as the challenges .on the other hand ,other

challenges were reportedly most often include the ‘Insufficient ICT training support for teachers’ with mean 3.5983 and 60.7% of Extremely agree or Highly agree. And disagree with item ranking number 9 which is ‘Fear of Using modern Technology’ as the challenges confronted in using ICT in teaching learning. Although overall mean of weigh level of technical colleges teachers’ acceptance of the challenges confronted in using ICT in teaching learning is 3.1239

4.9 Scatter Plot and Correlation of the Items Section

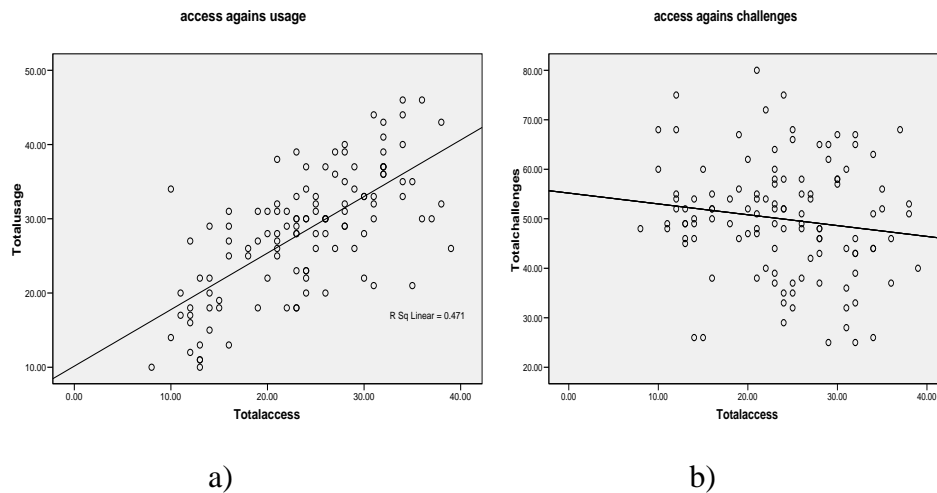


Figure: 4.6 a) total access vs usage and (b) Total access vs challenges

The figures: 4.6 above show scatter plot of access vs usage and access vs challenges in a linear form of correlation.

The figure indicates that total usage explains much more positive linearly relation in total access. While total challenges explain moderate negative linearly relation in total access. Furthermore; total usage correlated total access at the 0.01 significant levels (1 tailed) which show their strongness relationship with total access. The total challenges correlate with total access at the 0.05 significant levels. This consequently revealed that, when technical college’s teachers access to ICT facilities increase their usage increase in 0.668 proportions respectively and their challenges decrease in 0.158 proportion directly.

Table: 4.5 Correlation interpretation table of the section items

S/N	r value	interpretation
01	1.0	Perfect

02	0.70-0.001	Very strong
03	0.50-0.69	Strong
04	0.30-0.49	Moderate
05	0.10-0.29	Low
06	0.01-0.09	Negligible

Correlation coefficient according to Saud (2004)

The table: 4.5 above shows the interpretation of correlation where by $r = 1.0$ implies that the correlation is perfect and their relationship is extremely superior, whereas $r = 0.7-1.0$ indicates that the correlation is very strong and their relationship is high, whereas $r = 0.50-0.69$ indicates that the correlation is -strong, and their relationship is highly superior. Hence, whereas $r = 0.30-0.59$ indicates that the correlation is moderate, and their relationship is -small, whereas $r = 0.10-0.29$ indicates that the correlation is low, and their relationship is highly little, whereas mean $r = 0.01-0.9$ indicate that the correlation is negligible, and their relationship is either extremely tiny or no relationship at all. Take note; negative value show relationship but in opposite direction, which means when one variable increases other decrease in same proportion.

4.10 Correlations

Table: 4.6 Correlation table of the section items questionnaire

		Total access	Total usage	Total challenges
Total access	Correlation Coefficient	1.000	.668(*)	-.158(*)
	Sig. (1-tailed)	.	.000	.045
	N	117	117	117
Total usage	Correlation Coefficient	.668(*)	1.000	-.145
	Sig. (1-tailed)	.000	.	.059
	N	117	117	117
Total challenges	Correlation Coefficient	-.158(*)	-.145	1.000
	Sig. (1-tailed)	.045	.059	.
	N	117	117	117

**Correlation is significant at the 0.01 level (1-tailed).

* Correlation is significant at the 0.05 level (1-tailed).

A Spearman's rho product –moment correlation was conducted to examine the relationships between total access, total usage & total challenges in this study. Total access was positive related to total usage, $r(117) = .668$, $p(0.000) < 0.01$ at the 0.01 significant level. This indicates that the

correlation is positively strong, and their relationship is highly superior. It means that whenever the technical college's teachers access of ICT facilities increase, their use of ICT-pedagogy are highly increase, their teaching should be modernize & progressto21stcentury and the students understanding will improve, effectively perform in a -workplace of this century. However, the total access was negatively related to total challenges, $r(117) = - .158, p (.045) < 0.05$ at the 0.05 significant level. This indicates that the correlation is negatively low, and their relationship is highly little. It means that whenever the technical college's teachers access of ICT facilities increase, their challenges- of ICT-pedagogy are decreasing, their teaching may be modernize & progress to 21stcentury. A complete list of correlation is presented in table: 4.6 correlation above.

CHAPTER FIVE

Discussion, Recommendation and Conclusion

5.1 Introduction

The aim of this study was to examine the training need in ICT-based pedagogy for the teachers of Technical Colleges. It's basically addressing the two research questions that were sought to answer by the study. Research question one: To what extent do teachers use ICT-based pedagogy and skills in teaching and learning process? To answer this, two items table of accessibility and usability were formed.

5.2 Finding and Discussion

From table: 4.2 (see chapter 4) above, the total mean score of teachers' accessibilities of ICT are 2.9722 which are classified as moderate. According to the mean score level classification table (see chapter 4, table: 4.1). This moderate total mean score of teachers' accessibilities of ICT means that the level of technical colleges teachers' ICT accessibility in Yobe is not sufficient enough for teachers to get hold of the ICT material needed for ICT use in integrating every aspect of school learning to face the ICT challenges of 21st century.

Though total mean is moderate, but items: Desktop computers/ Laptop, Mobile phones provided by the school and Computer labs (there more extent % are: 456.1, 52.2, 53.0.) which means technical colleges teachers' have more accessibility to them. While remaining items which- are: Internet access (wired/wireless), Interactive whiteboards, Digital camera or Video recorder, Multimedia Projector, and Online Learning Management Systems (Google Classroom, Moodle etc.); (there less extent % are 42.7, 43.6, 40.2, 42.7, 41.9 which are high than more extent%). This means that technical college's teachers' have very low accessibility to them. Finally, the accessibility of ICT material by technical college's teachers' is in lowest limit which should not enable them to make actualization use of ICT to tackle challenges of 21st century.

Thus, it comparable to research conducted by Augustine, Daud & Kamaruddin (2018) title "teachers' use of ICT in teaching and learning in aba north district secondary schools" which reveals that "teachers do not have the needed level of access to ICT materials which will enable them to make the actual use of ICT"(p.7); Also in line with Pima (2019) "the results suggest that

the availability of ICT resources such as computers, printers, scanners, the internet, and mobile devices is an important factor that could affect the decision of teachers towards the acceptance and use of ICT in teaching in secondary schools. Furthermore, the results indicate that with the available ICT resources for teaching, it can be perceived as easy to use since the devices are known and probably are already in use” (p.6). Contrary to Verma & Dahiya (2016), ICT infrastructure and ICT recourses are sufficiently available and appropriately utilizing. And Ogbiona, & Ogboiyi (2014) also told that ICT facilities are sufficiently available and accessible in the schools library, but the extent of usages of UPS, CD-ROM and projector is generally poor.

Furthermore, according to table: 4.3 (see chapter 4) above, the total mean score of teachers’ usability of ICT is 2.8481 which is classified as moderate, according to the mean score level classification table (see chapter 4, table: 4.1). This moderate total mean score of teachers used of ICT means that the level of technical college’s teachers’ ICT use in Yobe is not sufficient enough for ICT integrating every aspect of school learning to tackle the ICT challenges of 21st century. Though total mean is moderate, but items 1&2 which are Browse/search the internet to collect information to prepare lessons, Use Office applications (Word Processor, Presentation) to prepare lessons (53.8%, 35.9%)in high extent of usage. This show that Browse/search the internet to collect information to prepare lessons is single item teachers frequently use in teaching. However, the Use an online learning platform to provide learning materials to students, Multi-Media Projector & Pointer (wireless) teachers opinion are moderated (high & less extent approximately same) which means teachers utilize partially in teaching.

Referring to table: 4.3 (see chapter 4) of the research finding, items that consequence of ICT usage in teaching/learning process situated at less extent level are: Post homework for students on the school website/ Online learning portal(44.4%), Use ICT to provide feedback and assess students’ learning(43.6%), Communication with parents through email/ online(41.9%), Use Interactive whiteboards in the class(47.9%), Use Learning Management Systems, Google Classroom, Moodle etc. (45.2%), Audio/ Sound device during the class teaching(48.7%), are less extent of usage by teachers. That means usability of ICT-based pedagogy teaching & learning process is very low in technical colleges’ of Yobe state. This was in line with Chao (2015), aught

that, most developing countries lack ICT infrastructure and teachers highly need appropriate training to enable them to use ICT in pedagogy.

The second research question is “To what extent do technical college teachers need the training on ICT-pedagogy?” To answer this question, table: 4.4 (see chapter4) above was form. The table contains sixteen items of challenges that confronted integrating ICT-based -pedagogy in teaching/learning process. Because by having the challenges hold at hand, one can able to identify their (minimum, medium& maximum of the) worseness on ICT-based pedagogy in teaching & learning process. And training should be given based on level need. Referring consequences table: 4.4 (see chapter 4) of technical colleges Teachers’ acceptance on challenges facing in integrating ICT-based pedagogy in teaching and learning process

The overall mean score of technical colleges Teachers’ acceptance on challenges facing integrating ICT-based pedagogy in teaching and learning process is 3.1239 which means moderate according to the mean score level classification table (see chapter 4, table: 4.1). This moderate overall mean score of “teachers’ challenges that confronted integrating ICT-based pedagogy” means that the level of college’s teachers’ challenges while integrating ICT-based pedagogy in Yobe is sufficient to hinder integrating ICT- in every aspect of school learning to overcome- changes of 21st century.

Although overall mean score is moderate, but items : Lack of interest to use ICT devices(Less Agree 41.0%), Fear of Using modern Technology(L.A. 51.3%), Lack of time to prepare, explore and develop lessons in online(L.A.48.1%), Lack of confidence to use ICT devices for teaching(L.A. 51.3%), Lack of Insights of the benefits of using ICT in both short & long term(L.A. 42.8%), college’s teachers reject them as challenges of integrating ICT-basedpedagogy. Thisresult show that, technical colleges’ teachers interested to use ICT gadgets in teaching. It in line with Pima (2019) Markedly, teachers’ responses indicated interest in using ICT over a traditional face-to-face pedagogical approach. Also supported by Olakanmi(2017), Teachers’ responses through the focus group interview showed that they are willing and ready to integrate ICT facilities in the teaching and learning processes.

However, finding also revealed that teachers Fear not of using modern technology; they have time to prepare, explore and develop lesson in online; they are confidence to use ICT devices for teaching. Contrary to Haji (2017) low competencies of the teachers, discouragement by teachers to use pedagogical equipment that they were not initially trained to utilized gadget in a professional manner; however, they are in sighted the benefit of ICT in both short & long term. These aligned with pima (2019) “new technologies are useful to improve teaching in secondary schools in Tanzania. This can be interpreted to mean that teachers are ready to use ICT in teaching because it can improve their performance and productivity in secondary schools”(p.7).

By and large, Referring to table: 4.4 (see chapter 4) of research finding, the remaining items admire as challenges confronted use of ICT-based pedagogy in teaching and learning are: Insufficient number of internet-connected computers (Highly Agree 56.5%); Insufficient Internet speed/ bandwidth(H.A. 49.6%); Insufficient number of interactive whiteboards(H.A 53.8%); Insufficient number of laptops/ desktops(H.A. 53.8%); School computers out of date and/or needing repair(H.A. 49.6%); Insufficient technical support for teachers(H. A. 52.1%); Insufficient ICT training support for teachers(H.A. 60.7%); Lack of technological hands-on training/courses (H.A. 41.8%) ; Lack of proper policies on using ICT across curriculum (46.2%); and Task related incentives (salary, promotion etc.) provide demotivation to use ICT(H.A. 53.0%).

This revealed that challenges confronted use of ICT-based pedagogy in teaching include Insufficient number of internet-connected computers; Insufficient Internet speed/ bandwidth which Supported by Lorenzo (2017). “The most pressing challenge in the implementation of blended learning strategy as experienced by the students is the lack of available computers and internet connection to be utilized by the students for their online activities. While on the part of the teacher, the most pressing challenge is the slow internet connection which is time consuming in the posting of online lectures and activities, and in the retrieval and checking of students’ online activities.”(p54), other challenges are School computers out of date and/or needing repair in line with finding of Verma, & Dahiya (2016), the study revealed that there is huge need for replacement of existing ICT infrastructure with latest modern ones.

Furthermore, -teachers' responses show that insufficient technical support for teachers was cited by 52.1 percent as challenges; followed by insufficient ICT training support for teachers at 60.7 percent; followed by lack of proper policies on using ICT across curriculum by 46 percent; other problems were Task related incentives (salary, promotion etc.) provide demotivation to use ICT at 53.0 percent. These supported by Verma & Dahiya (2016) "It has also revealed that there is huge need for replacement of existing ICT infrastructure with latest one; Requirement of large Internet bandwidth in research and learning activities. It has been also found that there is huge need for training/workshops for spread awareness about latest ICT technology" (p.7)

5.2 Conclusion

The effective implementation of information and communication technology (ICT) base pedagogy in technical colleges is a crucial process that requires an active and collaboration effort of all the stakeholders especially teachers and the state government so as to establish a solid platform upon which the technical colleges teaching and learning process will run smoothly.

As the research is completed, it can conclude that training on ICT-based pedagogy for teachers of technical colleges in Yobe state, Nigeria toward ICT-based pedagogy acceptances and utilization in teaching and learning process is still can be improvise. The research findings revealed that ICT-infrastructure and ICT recourses are not sufficiently available talk less proper utilizing. In term of challenges related with ICT-based pedagogy (ICT technological pedagogical knowledge), teachers are lacking how to involve students to the activities, and they are facing difficulty in manage classroom while utilizing technology as result of inadequate facilities.

Although the level of the access and usage are almost moderate level it does not means recently the effectiveness of ICT-based pedagogy for teaching and learning in technical colleges is worried. The finding of this study indicates that the existing level of extent access & usage on the ICT equipment by technical colleges teachers is very low, with access of Mobilephones, computer labs and browse /search the internet to collect information to prefer lesson predominantly used. The provision of modern ICT equipment, facilities and gadget in technical colleges arise. The utilization of information and communication technology and the pedagogy while teaching can be

alternative to these improvements, to be able to integrate information and communication technology in teaching is needed a technological pedagogical knowledge frame work by a teacher. Therefore, teachers in Nigeria should have the capability in order to realize national educational goals so that the Nigerian nation can compete with other nation in the current 21st century era.

5.3 Recommendation

Base on the analysis of research question 1 as show in table: 4.2 I recommended that for the enhancement of ICT-based pedagogy integration in teaching, provision of enough modern facilities is crucial important in maintaining the standard of teaching in 21st era. Teacher training programs on digital literacy as well as ICT-based pedagogy is strongly recommended to allow teachers not stagnant in inspiring. Furthermore, there should be modern ICT center where technical college's teachers can be trained periodically on update ICT-based pedagogy gadget of 21st century. Since the objective of the Federal Republic of Nigeria include providing sufficient facilities and enough pedagogical principles to promote their impartibility that able them raise the learner's standard to be computable in the world.

According to Federal Republic of Nigeria (2014) the objective is "To ensure that teachers have sufficient mastery of academic content disciplines and of pedagogy principles and their applications, including enhanced capacity to respond to learners" (p13). However, seeing vital role of teachers in 21st century, technical colleges teachers in the state should be able to positive contribution in term of the Yobean human development; this contribution can be in form of effort to improve learning process in the classroom bases; the use ICT can be alternative to improvement otherwise learning be stagnant and modern facilities became useless.

5.4 Suggestions for Further Study

By and large, the related study may be carried elsewhere by selecting others population in a different institution within the state or otherwise. The population cans be in creased to investigate the region or nation. Also, Research could also find out teachers training in ICT-based pedagogy to yield dynamic changes of era. Another research can be on impact of the teacher's motivation on the utilization of ICT-based pedagogy in teaching and learning process.

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APPENDIX A



UNIVERSITY ISLAMIQUE DE TECHNOLOGIE
ISLAMIC UNIVERSITY OF TECHNOLOGY DHAKA,
BANGLADESH ORGANISATION OF ISLAMIC COOPERATION



Dear Sir/Madam,

I am a student in the above named institution conducting thesis titled “Study of Teacher Training on ICT-Pedagogy for Teachers of Technical Colleges in Yobe State, Nigeria” to measure the teacher’s current practice related to ICT-pedagogy, investigate the areas related to ICT-pedagogy training and examine challenges that technical colleges teacher are facing in teaching while using ICT.

Your participation in this research is voluntary. Your confidentiality and anonymity are assured. Return of the survey to me is consent for your responses to be compiled with others. You will not be individually identified with your questionnaire or responses. Please understand that use of this data will be limited to this research, although result may be published in the form of dissertation as well as journals article or conference presentations.

I greatly appreciate your participation in this research. The survey will take approximately 15 minutes to complete. Please return the survey within two weeks (25 May 2019) to the designated person.

Thank you for your interest and participation in this study. I genuinely appreciate your time.

Sincerely,

Yusuf Dauda Hassan

Researcher

APPENDIX B

Questionnaire

On

Study of Teacher Training on ICT-Pedagogy for Teachers of Technical Colleges in Yobe State, Nigeria

Part A: Demographics

School Name:

Discipline:

Gender:

Part B: Current Practices of ICT-pedagogy

Rating Scale:

5	4	3	4	1
Very great extent	Great extent	Neutral	Little extent	Very little extent

Using the above 1-5 rating scale, please indicate, by **circling** the most correct response, the degree to which you agree with the statement listed below:

Q1: To what extent do you have the access on the ICT equipment in your classes?

1 2 3 4 5 Desktop computers/ Laptop

1 2 3 4 5 Internet access (wired/wireless)

1 2 3 4 5 Mobile phones provided by the school

1 2 3 4 5 Interactive whiteboards

1 2 3 4 5 Digital camera or Video recorder

1 2 3 4 5 Computer labs

1 2 3 4 5 Multimedia Projector

1 2 3 4 5 Online Learning Management Systems (Google Classroom, Moodle etc)

Q2: To what extent do you use the following items in teaching & learning process?

- 1 2 3 4 5 Browse/search the internet to collect information to prepare lessons
- 1 2 3 4 5 Use Office applications (Word Processor, Presentation) to prepare lessons
- 1 2 3 4 5 Post homework for students on the school website/ Online learning portal
- 1 2 3 4 5 Use ICT to provide feedback and/or assess students' learning
- 1 2 3 4 5 Communicate with parents through email/ online
- 1 2 3 4 5 Use an online learning platform to provide learning materials to students
- 1 2 3 4 5 Use Interactive whiteboards in the class
- 1 2 3 4 5 Use Learning Management Systems (Google Classroom, Moodle etc)
- 1 2 3 4 5 Audio/ Sound device during the class teaching
- 1 2 3 4 5 Multi-Media Projector & Pointer (wireless)

Part C: Challenges confronted in using ICT in teaching learning

1	2	3	4	5
Strongly disagree	Disagree	Neutral	Agree	Strongly agree

Using the above 1-5 rating scale, please indicate, by circling the most correct response, the degree to which you agree with the statement listed below:

Q3: What are the challenges you are facing in integrating ICT-pedagogy in teaching/learning?

- 1 2 3 4 5 Insufficient number of internet-connected computers
- 1 2 3 4 5 Insufficient Internet speed/ bandwidth
- 1 2 3 4 5 Insufficient number of interactive whiteboards
- 1 2 3 4 5 Insufficient number of laptops/ desktops
- 1 2 3 4 5 School computers out of date and/or needing repair

- 1 2 3 4 5 Insufficient technical support for teachers
- 1 2 3 4 5 Insufficient ICT training support for teachers
- 1 2 3 4 5 Lack of interest to use ICT devices
- 1 2 3 4 5 Fear of Using modern Technology
- 1 2 3 4 5 Lack of technological hands-on training/courses
- 1 2 3 4 5 Lack of proper policies on using ICT across curriculum
- 1 2 3 4 5 Lack of time to prepare, explore and develop lessons in online
- 1 2 3 4 5 Task related incentives (salary, promotion etc.) provide demotivation to use ICT
- 1 2 3 4 5 Lack of confidence to use ICT devices for teaching
- 1 2 3 4 5 Lack of ICT skills
- 1 2 3 4 5 Lack of Insights of the benefits of using ICT in both short & long term