



APPLICATION OF INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) FOR EFFECTIVE TEACHING AND LEARNING IN 21ST CENTURY. (ACASE STUDY OF AMINU KANO COLLEGE OF ISLAMIC AND LEGAL STUDY, KANO)

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ABSTRACT

The purpose of this paper is to evaluate the application of Information and Communication Technology (ICT) for effective teaching and learning in Aminu Kano College of Islamic and legal studies, kano, such as multimedia in teaching and learning, to suggest other useful teaching methods that can be attempted in imparting knowledge to the students. Basically teaching and learning must include two major components sending and receiving information digitally with the aid of computer and other related ICT equipment utilized in teaching and learning. Ultimately, a teacher tries his best to impart knowledge as the way he understood it, the learner also needs to understand it effectively. A total of 250 academic staff and 500 students were selected randomly. A questionnaire was used as an instrument, and Chi-square method was used for data analysis. The research findings show that, ICT media brings abstract concept to real life situations for proper understanding of teachers and students. Stable power supply, appeal for funding to ICT companies, proper maintenance of ICT equipment and trainings on use of ICT media is recommended in general.

Keywords: *Information and Communication Technology (ICT), Teaching process, Learning process, Tools*

INTRODUCTION

Information and Communication Technologies (ICTs) are diverse set of technological tools and resources used for creating, storing, managing and communicating information. For educational purposes, ICTs can be used to support teaching and learning as well as research activities including collaborative learning and inquiring. One of the main applications of the ICTs in higher education is teaching and learning based on these new technologies

The modern communications technologies has greatly improve and increased the modern method or ways of accessing and acquiring information which has also improve teaching, learning and knowledge acquisition.

The modern digital ICT is a combination of hardware, software and multimedia equipments. Nowadays, ICT in education incorporates varieties of swiftly emerging technological innovations both in hardware and software which improves, facilitates and enhances teaching and learning process.



According to (Adu E.O *et al.*,2013) Information and communication technologies (ICT) have become common place entities in all aspects of life. Across the past twenty years the use of ICT has fundamentally changed the practices and procedures of nearly all forms of endeavor within business and governance. Education is a very socially oriented activity and quality education has traditionally been associated with strong teachers having high degrees of personal contact with learners. Many important changes have occurred in the last few years in the education systems, which will require teachers and school leaders to upgrade and refine their technology skills. Some of these changes are due to changes in government policies related to the use of information communication and technology (ICT) in schools while others are due to developments in state of the art pedagogical practices. In (Brakel *et al.*,2003). ICTs have a significant impact on all areas of human activity It is very imperative to state that information and communication technology (ICT) has affected changes to methods, purpose and perceived potentials of education.

The National Policy on Information and Communication Technologies (ICT) in Education (2010), states that ICT is “the art and applied sciences that deals with data and information. It encompasses all (equipments including computational machinery-computers, hardware, software, firmware, etc. and methods, practices, processes, procedures, concepts, principles and the sciences) that come into play in the conduct of the information activities: acquisition, representation, processing, presentation, security interchange, transfer, management, organization, storage and retrieval of data and information.

According to (Guma A. *et al.*2013) Most teachers leave teacher training institutions with limited knowledge of ways technology can be effectively used in their professional practice. In this age of digitization, being able to effectively apply technology should be high on the list of what teachers at all levels of our education should know and be able to do in any instructional transaction. There is substantial evidence that, if used appropriately for specific purposes in specific contexts, technology can be an effective tool in supporting teaching and learning.

Computer in Teaching and Learning

The desire for qualitative and learning is still rampant in the society and due to the age of digital technology, the ICT has affected our human activities in this urge to acquire knowledge and information hence, the use of computer in the teaching and learning process cannot be over emphasized in the society and most importantly in the development of a Nation socially, politically and economically. Meanwhile, most of the devices and equipment used in our daily activities are more of digital devices and hence there is need to acquire, get and effectively use the potentials of ICT in education (teaching and learning) process.

According to (Wasif M. *et al.*, 2011). In many countries, Information and Communication Technology (ICT) has a lucid impact on the development of educational curriculum. This is the era of Information and Communication Technology, so to perk up educational planning it is indispensable to implement the ICT in Education sector. Student can perform well throughout the usage of ICT. ICT helps the students to augment their knowledge skills as well as to improve their learning skills.

Nowadays, ICT has been of very important tools in teaching and learning. In some subject areas, some teachers are not capable of providing up to date information in the field of study, hence, the use of ICT tools can be used to fill these gaps because it can easily provide access to information through the internet resources, such that it will provide accurate, reliable and correct information in different areas of teaching and learning. Some of these facilities provided by ICT are online interaction facility, group networking discussion, video conferencing, exchange of ideas, broadening of information base. ICT provides variety in the presentation of content which helps learners in having a deep understanding of information been sought for. With the usage of ICT tools most especially, internet facilities there is qualitative and greater improvement of teaching and learning which delivers a good mastery of the learning process and qualitative learning that could not be gotten in other method of learning.

The use of ICT in education lends itself to more student-centered learning settings. But with the world moving rapidly into digital media and information, the role of ICT in education is becoming more and more important and this importance will continue to grow and develop in the 21st century. (Guma A. *et al.*, 2013).



It is evident that ICT based resources and applications should drive the teaching learning process of all disseminating Information and Communication Technology related Courses. Presently most educators adopt a theory-first approach and sometimes suspend teaching the application skills. For effective learning and performance, theory and applications should be interwoven and integrated. Or, at least, applications should be considered first, and then theory, to ensure that theory is related to real-world concepts and to enable students form conceptual relationships between theory and applications and create life-long learning experiences. (Annie O. *et al.*, 2012)

According to (Olokoba A. *et al.*, 2014). Asserted that management of information system is essential for efficient running of schools or institutions of learning, hence the following recommendations are made:

- i. Government in partnership with organizations should strive to equip the schools with adequate ICT facilities;
- ii. Government and school authority should reward any teacher who tries his hands on innovation ideas;
- iii. Needs analysis should be employed whenever teachers are being sent for training so that maximum benefits can be derived from such training programmes.

Information and Communication Technology (ICT) for Education in Nigeria

In order to meet up the ICT challenges and the need to be among developed nations more especially in education, According to *The National Policy on Information and Communication Technologies (ICT) in Education*, Retrieved on the 7th November, 2015 stated that the Federal Government of Nigeria formulated ICT policy with stated objectives, which include the following:

- a) To ensure that ICT resources are readily available to promote efficient national development
- b) To guarantee that the country benefits maximally, and contributes meaningfully, by providing the global solutions to the challenges of the Information Age
- c) To empower Nigerians to participate in software and ICT development
- d) To encourage local production and manufacture of ICT components in a competitive manner
- e) To establish and develop ICT infrastructure and maximize its use nationwide
- f) To empower the youth with ICT skills and prepare them for global competitiveness
- g) To integrate ICT into the mainstream of education and training
- h) To create ICT awareness and ensure universal access in promoting ICT diffusion in all sectors of national life
- i) To create an enabling environment and facilitate private sector (national and multinational) investment in the ICT sector
- j) To encourage government and private sector joint venture collaboration
- k) To develop human capital with emphasis on creating and supporting a knowledge-based society
- l) To build a mass pool of ICT literate manpower using the NYSC, NDE, and other platforms as a train-the-trainer scheme for capacity-building.

Statement of the Problem

This paper focuses on the Academic staff and Students of Aminu Kano College of Islamic and legal studies kano, as a case study.

The Paper is intended to assess the availability and adequacy of ICT facilities in the college, and to which extent such facilities are being utilized. It will however be agreed in that ICT virtually touches all areas of human endeavor, tertiary institutions are not exceptional. This Paper has been carefully designed to look at the major areas of applications of ICT in teaching and learning Process in Aminu Kano College of Islamic and Legal Studies Kano.

Purpose of the Study

The purpose of this study is to investigate an effective application of ICT in teaching and learning in Aminu Kano College of Islamic and legal studies kano.



Research Questions

The research questions raised in this study were.

1. What are the challenges facing teachers and students in the application of ICT in Aminu Kano College of Islamic and legal studies kano?
2. Are there ICT facilities available for teaching and learning activities in Aminu Kano College of Islamic and legal studies kano?
3. What are the barriers to effective use of ICT in Aminu Kano College of Islamic and legal studies kano?
4. What is the level of performance of student with respect to gender in using ICT in learning?
5. What are the measures to solve the problems identified in the application of ICT in Aminu Kano College of Islamic and legal studies kano?

Research Hypothesis

The null hypothesis is rejected, the following hypothesis are generated:

- i. There is no significant difference in the male and female gender level in using ICT for learning purposes.
- ii. There is no significant difference in the teachers' and students' barriers to effective use of ICT for teaching and learning purposes.
- iii. There is no significant difference in the challenges faced by teachers and students in the application of ICT.

METHODOLOGY

Survey method was adopted in this study and the paper focuses on people and their views, beliefs, opinions, perceptions, motivations, attitudes and behavior. The population of the study is made of respondents that comprised staff (academic staff) and students drawn randomly from seven (7) schools in Aminu Kano College of Islamic and legal studies Kano. The schools are;

- ✓ School of Arts and Social Sciences
- ✓ School of General Education
- ✓ School of Languages
- ✓ School of Sciences
- ✓ School of Islamic and Qur'anic Science
- ✓ School of Early childhood and primary education
- ✓ School of shariah and civil law

750 copies of questionnaire were dispatched but not all the questionnaires were duly filled by the respondent. 250 Questionnaires were distributed to teachers and 500 copies were distributed to students. About 107 copies of questionnaires were rendered invalid because, some teachers and students could not fill them appropriately while others could not return theirs. At the time of collection only 643 copies were duly counted which however made the total number of the questionnaire analyzed to be 643. Mean statistics and percentage were used for analysis of data collected.

Data Analysis, Interpretation And Discussion Of Findings

The analysis is presented below. The researcher presents data obtained from the study. The mean score statistical analysis was adopted for the calculation of the research questions.

Table 1: Teachers and Students respondents' population in percentage

Type of Respondents	Number of Respondents (N)	Percentage (%)
Teachers	214	85.6
Students	429	85.8

Table 1 shows that the teachers constitute 214 (85.6%) of the respondents, while the students constitute 429 (85.8%) of the respondents.

Table 2: Data collected from Teachers respondents

S/N	ITEMS	SA	A	D	SD
1	ICT medias brings abstract concept to real life situations for proper understanding of students.	88	100	17	9
2	ICT media in the teaching and learning such as television, computer and projector ensure better retention of subject and make learning more permanent.	80	113	17	4
3	ICT media helps to stimulate student interest in reading and save time to understand the lesson	79	110	20	5
4	Uses of ICT like internet help staff and students have access to relevant research materials.	97	93	22	2
5	Academic staff considers the use of ICT media as waste of time.	72	110	31	1
6	Insufficient energy supply act as barrier to effective use of ICT in teaching and learning activities in the college	65	50	92	7
7	The lack of expertise to handle these ICT media by academic staff and students is a barrier to effective use of ICT in teaching and learning activities in the college.	45	71	90	8
8	Poor quality and inadequate maintenance of ICT hardware is a barrier to effective use of ICT in teaching and learning activities in the college.	57	90	49	18
9	There are enough ICT media like computer, electronic gadgets and overhead projectors in the college.	86	99	25	4
10	There are adequate provisions of televisions, video recordings in the lecture rooms.	91	90	23	10
11	Opaque and video camera are available in the college lecture rooms.	91	90	31	2
12	There is adequate provision of ICT (computer) learning software in all the school subjects in the college.	85	69	54	6
13	If fund is made available by government and other non-governmental agencies, the college will provide ICT facilities to the institutions.	68	118	19	9
14	If academic staffs are trained on the use of ICT media through organized seminar and conference, they will make appropriate use of ICT media in providing services.	94	91	17	12
15	If college management makes appeals to companies such as HP computer, Zinox and Compaq, they will assist the college in provision of computers to the college in form of computer	73	123	16	2

	instructional gadgets.					
16	Provision of stable power supply will ensure appropriate use of ICT media in teaching and learning activities in the college.	122	82	7	3	
	Total	1293	1499	530	102	

The above table shows how teachers responded to the questionnaire; the figures in the table were used to check the validity and reliability of the data obtained on each item from item 1 to item 16, the sum of the

total values given are 3424 (i.e. $1293+1499+530+102=3424$) which is the same as the total number of the respondents 214 multiplied by the number of item 1-16 that gives the same values 3424 (i.e. $214*16=3424$).

Table 3: Data collected from Students base on gender level respondents

S/N	ITEMS	SA		A		D		SD	
		M	F	M	F	M	F	M	F
1	ICT medias brings abstract concept to real life situations for proper understanding of students.	65	131	71	132	5	16	4	5
2	ICT media in the teaching and learning such as television, computer and projector ensure better retention of subject and make learning more permanent.	85	122	51	123	7	31	2	8
3	ICT media helps to stimulate student interest in reading and save time to understand the lesson	78	129	56	115	10	37	1	3
4	Uses of ICT like internet help staff and students have access to relevant research materials.	100	156	35	105	7	13	3	10
5	Academic staff considers the use of ICT media as waste of time.	27	65	49	84	39	63	30	72
6	Insufficient energy supply act as barrier to effective use of ICT in teaching and learning activities in the college	19	42	19	44	38	83	69	115
7	The lack of expertise to handle these ICT media by academic staff and students is a barrier to effective use of ICT in teaching and learning activities in the college.	23	25	15	44	40	109	67	106
8	Poor quality and inadequate maintenance of ICT hardware is a barrier to effective use of ICT in teaching and learning activities in the college.	28	72	38	45	30	72	49	95

9	There are enough ICT media like computer, electronic gadgets and overhead projectors in the college.	33	64	29	51	48	87	35	82
10	There are adequate provisions of televisions, video recordings in the lecture rooms.	52	98	58	102	22	53	13	31
11	Opaque and video camera are available in the college lecture rooms.	57	104	46	82	36	51	6	47
12	There is adequate provision of ICT (computer) learning software in all the school subjects in the college.	64	95	53	101	20	44	8	44
13	If fund is made available by government and other non-governmental agencies, the college will provide ICT facilities to the institutions.	71	141	56	101	13	19	5	23
14	If academic staffs are trained on the use of ICT media through organized seminar and conference, they will make appropriate use of ICT media in providing services.	90	154	46	96	5	21	4	13
15	If college management makes appeals to companies such as HP computer, Zinox and Compaq, they will assist the college in provision of computers to the college in form of computer instructional gadgets.	68	109	61	131	9	27	7	17
16	Provision of stable power supply will ensure appropriate use of ICT media in teaching and learning activities in the college.	95	194	35	63	7	21	8	6

The above table 2, shows how students responded to the questionnaire; the figures in the table were used to check the validity and reliability of the data obtained on each item from item 1 to item 16, the sum of the total values given are 6864 (i.e. $955+1701+718+1419+336+747+311+677 = 6864$) which is the same as the total number of the male and female respondents as 145 and 284 respectively, multiplied by the number of items 16 by number of male and number of female respondents and get the sum of the values obtained that gives the same values 3424 (i.e. $(16*145)+(16*284)=6864$).

The Null Hypothesis (H₀): the calculated χ^2 values obtained were simplified into two categories (Agreed and Disagreed) to represent the four categories (Strongly Agreed, Agreed, Disagreed and Strongly Disagreed) used in the questionnaire to the result simpler for better understanding. This was done by taking the average of each of the two χ^2 values (i.e. $SA+A/2=A$; $D+SD/2=D$) to make it a single χ^2 value as presented in the each of the research hypothesis tables below.

Research hypothesis 1: There is no significant difference in the male and female gender level in using ICT for learning purposes.

Table 4: Chi-square (X^2) value for Male and Female Students for gender level in using ICT for learning purposes.

	Agreed (A)	Disagreed (D)
Male	10.08	1.87
Female	5.60	10.54

Table 4 above shows that the responses of respondent on application of ICT for effective performance in teaching and learning. From the table, it is clear that enough the usage of ICT media like computer electronics gadgets, overfed projectors etc. in the Aminu Kano college of Islamic and legal studies kano, has a great impact for learning purposes. The null hypothesis is accepted as the X^2 value obtained are 10.08 and 5.60 for male and female students as agreed, using the X^2 table degree of freedom 3; for male gender the probability (p) is greater than or equals to 0.01 ($p \geq 0.01$), and for female gender the probability (p) is less than or equals to 0.05 ($p \geq 0.05$). That shows that there is significant difference in male and female gender in using ICT for learning purposes.
Note that, the detail of the analyzed values is presented in the index section in table 9.

Research hypothesis 2: There is no significant difference in the teachers' and students' barriers to effective use of ICT for teaching and learning purposes.

Table 5: Chi-square (X^2) value for Teachers and Students for the barriers to effective use of ICT for teaching and learning purposes.

	Agreed (A)	Disagreed (D)
Teachers	9.29	17.39
Students	24.92	42.32

Limitations to the teachers' and students' barriers to effective use of ICT for teaching and learning purposes. The null hypothesis is accepted as the X^2 value obtained are 9.29 and 24.92 for teachers and students, using the X^2 table degree of freedom 3; for teachers the probability (p) is greater than 0.05 ($p > 0.05$), and for students the probability (p) is greater than 0.001 ($p > 0.001$) gives more confidence as it exceeds the X^2 values in 0.001 probability column. That shows that there is significant difference in teachers' and students' barriers to effective use of ICT for teaching and learning purposes.

Note that, the detail of the analyzed values is presented in the index section in table 10.

Research Question 3: There is no significant difference in the challenges faced by teachers and students in the application of ICT.

Table 6: Chi-square (X^2) value for Teachers and Students for the challenges faced in the application of ICT.

	Agreed (A)	Disagreed (D)
Teachers	49.20	185.40
Students	254.52	340.26

Table 6 shows the response of the respondents on measures to solving the problems associated with the use of ICT in the Aminu Kano College of Islamic and legal studies kano. The table revealed that all the respondents agreed that problems associated with the use of ICT in the Aminu Kano college of Islamic and legal studies kano, can be solved if fund is made available by government for the college authority to purchase ICT media and subsequently teachers in the use of these ICT media. It also revealed that if the college management makes appeal to ICT companies such



as HP computer and COMPAQ etc., they will assist the college in the provision of computer instructional gadgets as well as provision of stable power supply will also ensure appropriate use of ICT media in the college. This conclusion is reached based on the X^2 of teachers with 49.20 as agreed and students with 254.52 as agreed as well. Both the two values give more confidence as the calculated X^2 value is more than 0.001 in the probability column ($p > 0.001$).

Note that, the detail of the analyzed values is presented in the index section in table 11.

Summary

The researcher found out that, application of ICT in teaching and learning services by Aminu Kano college of Islamic and legal studies kano, impact positively in the services provided by academic staff to the students

From the data collected and the research questions analyzed, we observed that the respondents have various opinions about ICT in terms of its usage in providing services to its users. The first research question revealed that ICT makes teaching and learning simple by bringing abstract concept to real life situations for students. ICT through its media or tools ensure better retention of subjects taught, and ICT saves time of the library users. The application of ICT based on the research questions among others highlighted that the college has enough computer electronics gadgets, video recording, and video camera, computer learning software. Although, the research also exposed some inadequacies associated with the ICT deployment such as lack of sufficient power supply, expertise, inadequate fund to mention but a few.

In the cause of the analysis of the data collected from the field and represented as shown on the various tables and through the use of chi-square statistical analysis, the following findings were made;

- i. ICT media brings abstract concept to real life situations for proper understanding of students;
- ii. ICT media in the teaching and learning such as television, computer and projector ensure better retention of subject taught and make learning more permanent;
- iii. ICT media helps to stimulate student's interest in reading and save time duly spent in the library;
- iv. The use of internet helps staff and students have access to relevant research materials;
- v. There are enough ICT media like computer electronics gadgets and overhead projectors in the college;
- vi. There is adequate provision of video recording in the lecture rooms;
- vii. Opaque and video camera are available in the college lecture rooms;
- viii. There are adequate provisions of ICT (Computer) learning software in all the school subjects in the college;
- ix. Lecturers consider the use of ICT media as waste of time;
- x. Insufficient energy supply act as barrier to effective use of ICT in teaching and learning activities in the college;
- xi. The lack of expertise to handle these ICT media by academic staffs and students is a barrier to effective use of ICT in teaching and learning activities in the college;
- xii. When fund is made available by government, the college will make provision for the use of ICT media to five schools in the institution;
- xiii. When college management makes appeal to ICT companies such as HP, Zinox, Samsung, Toshiba and COMPAQ etc., they will assist the college in the provision of computer instructional gadgets;

Conclusion

The study critically looked at the application of ICT for effective performance in teaching and learning in Aminu Kano college of Islamic and legal studies, kano. The research questions were all proved positively, that there is no significant difference in all the conditions stated. The null hypothesis has been proved with confidence in the results obtained. A research design method was used in the study, and the population of the study is made up of respondents that comprised academic staff and students drawn from the seven schools in Aminu Kano college of Islamic and legal studies kano. The questionnaires used as instrument for data collection were analyzed using chi-square. The research work or findings revealed that ICT brings abstract concept to real life situation for proper understanding of



teachers and students; ICT helps to stimulate academic staff and students' interest in reading and save time duly spent in the study sessions. The study also proffered suggestions to the problems identified in the course of carrying out the work. The study recommended stable electricity supply, appropriate funding, adequate textbooks to mention but a few.

Finally, the work made suggestions for further studies based on the other areas in ICT that are very crucial in the use of ICT in teaching and learning.

Recommendations

The following recommendations are proffered by the research:

- a. There should be provision of stable power supply to ensure appropriate use of ICT media in teaching and learning service in the college. This is to say that alternative standby generator to strictly serve the college or liaison with PHCN officials on the way out;
- b. College management should make appeal to ICT companies such as HP, Zinox, Toshiba, Samsung etc. to assist the college in the provision computer instructional gadgets;
- c. There should be construction of e-library with large reading space to facilitate efficient utilization of library resources in the college;
- d. There should be proper maintenance of hardware as well as provision of suitable educational software for the use of staff and students;
- e. There should be adequate provision of relevant textbooks in the college;
- f. Academic staff and students should be trained on the use of ICT media through organized seminar and conferences. This would go a long way in check-mating underutilization of ICT resources in the college and;
- g. Government should make fund available for the provision of ICT media to the existing five schools in the college.

Further Research

In the process of carrying out the study certain problems were unfolded, where by those problems will provide more grounds for understanding the problems. It is suggested that; further research work is needed on the student's perception of teaching and learning on the use of ICT in the college services. Further investigation could be conducted on the attitude of school management in the provision of ICT resources and services for teaching and learning.

In addition, an investigation should be carried out on the ways of managing challenges inherent in the use of ICT resources in the college.

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