



SUSTAINABLE ROLES OF ICT-BASED TECHNOLOGY IN RESEARCH WORK AND DATA MANAGEMENT IN ACADEMIC SETTINGS OF NIGERIA INSTITUTIONS

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Abstract

ICT-based technology has become an indispensable in academic environment which majority of researchers cannot do without due to series of innovations and transformations it has fetched in less time with bearable cost. This research aimed to study the sustainable roles of information and communication technology as research based technology and Data Management in Nigeria Institutions' Academic Settings. The research was a descriptive survey with random multistep method employed for sampling among male and female students and staff in proportion with the community size. The population included students and academic staff of tertiary institutions in which 520 respondents were received and analyzed out of 535 participants. The researcher developed 15 statements as questionnaire with a grading scale of Likret type used for data collection whose validity and reliability was confirmed by Cronbach's alpha. The chi-square table was used as inferential statistics section with regard to the measurement scale. Three research hypotheses were raised and in the first hypothesis, the calculated chi-square (X^2) Table value of 31.5 is greater than chi-square (X^2) Table value of 5.345 at 0.05 alpha level significance, since the table value is less than calculated value, therefore, null hypothesis stated that there is no significant relationship between ICT-Based Technology and Research work in Nigeria Tertiary Institution is hereby rejected while alternative hypothesis stated that there is significant relationship between ICT-Based Technology and Research work in Nigeria Institutions' academic settings is accepted. In the second hypothesis, the calculated chi-square (X^2) Table value of 11.2 is greater than chi-square (X^2) Table value of 7.251 at 0.05 alpha level significance, since the table value is less than calculated value, therefore, null hypothesis stated that there is no significant relationship between ICT-Based Technology and Data management in Nigeria

institutions' academic settings is hereby rejected while alternative hypothesis there is significant relationship between ICT-Based Technology and Data management in Nigeria tertiary institutions is hereby accepted. Hypothesis three revealed that the calculated chi-square (X^2) Tab. value of 26.4 greater than table value of 7.14 at 0.05 alpha level significance, since the table value is lesser than calculated value, therefore, null hypothesis stated that there is no significant relationship between Researchers ICT knowledge and utilization of ICT-Based Technology in data management is hereby rejected while alternative hypothesis stated that there is significant relationship between Researchers ICT knowledge and utilization of ICT-Based Technology in data management is hereby accepted. Findings therefore revealed that using ICT-Based Technology is effective in research work and data management. It is generally effective on Tertiary Institution students' and academic staff educational improvement to a greater extent.

Keywords: *ICT-Based, technology, research work, data management and academic settings*

Introduction

The Information and Communication Technology (ICT) in the 21st century has revolutionized all profession worldwide (Buseni, 2013) coupled with significant improvements through facilities such as word processing, communication facilities in the form of electronic mail, databases in relation to filling and data retrieval. All ICT equipment will remain fit for purpose, relevant to the needs of the service and in a supportable state (NFRS, 2019). The expanded growth of this information and communication technology has opened new era of digitization which is proving to be a great challenge for researchers and scientists around the globe (Ritu *et al.*, 2017). According to Ritu *et al.*, (2017), the utmost paradigm is to handle and process the explosion of data, that is 'Big Data' which is a widely anticipated term with the potential to handle heterogeneous, complex, and unstructured data with minimal cost and discover relevant hidden information in the least amount of time. In carrying out research work without minding the area these days require the integration of ICT-based technology ditto for managing big data for future consultation and present utility. Agbatogu *et al.*, (2011) opined that technology has been a

significant tool in almost all human endeavours. Jaiyeola (2007) argued that ICT is like an engine that could be used in so many ways, the same engine that makes the aircraft to move, could make a conveyor to convey finished product from production line to the storage location, the same could be used for automobile, grinding machine, etc. Also Ofurum and Ogbonna (2008) expressed information technology as the combination of computing, telecommunication and video techniques for the purpose of acquiring, processing, storing, and disseminating vocal, pictorial, textual and numerical information. The computing techniques provide the capacity for processing and storing of information; the telecommunicating techniques provide the capacity for communicating the information to users; and the video techniques, the capability for high quality display of images. Saturnina (2019) opined that most teachers are of the opinion that the use of ICT helps them improve teaching through updated teaching and research materials accessed online. Besides these, use of ICT in research has dramatically reduced the barriers and obstacles in research attributable to distance through the use of social networks and web portals such as 'My Net Research' (Anandarajan and Anandarajan, 2010). According to Ashish (2019), a systematic and inclusive ICT implementation, with the participation of all areas inside an academic institution, is essential to increase the chances of success in every corollary where ICT can be embraced. This ICT incorporates electronic technologies and techniques used to manage information and knowledge, including information-handling tools used to produce, store, and process, distribute and exchange information (Chandrasekhar and Ghosh, 2001). That is why the US National Higher Education ICT Initiative (2003) defined ICT knowledge as "the ability to use digital technology, communication tools, and/or networks appropriately to solve information problems in order to function in an information society. This includes the ability to use technology as a tool to research, organize, evaluate, and communicate information and the possession of a fundamental understanding of the ethical/legal issues surrounding the access and use of information. ICT tools are also indispensable to researchers because of the current volume and complexity of information available from different sources which include peer-reviewed journals, the Internet, mainstream media (Chandrasekhar and Ghosh, 2001). Ajayi (2008) highlighted that the world of

today is considered as a global village through the use of ICT in different educational, political, economic and social sectors.

The application of ICT in research has caused significant transformation in our modern world not only because it helps to save time and money used during and after research, but it also reduces the difficulty in working with big data or information resources which were impossible in the past. This has advanced the analysis of research findings (University of Cape Town, 2016). Besides, the use of ICT in research has dramatically reduced the barriers and obstacles in research attributable to distance through the use of social networks and web portals such as 'My Net Research' (Anandarajan and Anandarajan, 2010). ICT enables researchers to gather data from thousands of subjects at a low cost which gives researcher the ability to explore the effects of the minor procedural changes or to tease out interactions that might be missed in a smaller sample (American Psychological Association, 2016).

Statement of the Problems

The initiation of the ICT- Based Technology has reformed the life of the global community in all ways. Its usefulness seems to manifest greatly in the academic and research work circles too. Even though most students can be proud of themselves as being computer literate, the fact remains that some are yet to know major roles of ICT- Based Technology in research work and data management and the transformation derived from its usage. For the developing countries like Nigeria to grow and attain its social and educational status, the country must be fully ready in strengthen and empower its academic institutions, both in science and technological capacity. Hence, the students in their respective field have an easy, reliable and interactive accessing and retrieving of useful information when embarking on research work through ICTs. However, the effective use of this technology greatly depends on some associated factors such as purposes, students experience, locations, exposure, research work and field, among others particularly in academic environment.

Objectives of the Study

The study is aimed at surveying the sustainable roles of ICT-Based Technology in research work and data management in Nigeria Tertiary Institutions.

Other specific objectives are as follow:

1. To find out if students and academic staff use the ICT-Based Technology for their research works
2. To establish the sustainable roles of ICT-Based Technology in research work and data management in Nigeria tertiary institutions.
3. To ascertain the contributions of the internet services to the relevance of student research works in tertiary institutions.

Significance of the Study

The present work is most significant one because Information and Communication Technologies are a factor which exposed the root roles of ICT-Based Technology in research work and data management in Nigeria. It will as well explore and present the element of improvements for students' access to information on academic level. Research will be reviewed and other benefits that are yet to be discovered by the students in Tertiary Institutions in Nigeria would be addressed. This study will be of immense useful to researchers conducting their studies in related subject as it will remain a useful and reference document.

Research Hypotheses

The following hypotheses were formulated in line with the research questions for the study. They are as follows:

Hypothesis One: There is no significant relationship between ICT-Based Technology and Research work in Nigerian Tertiary Institutions.

Hypothesis Two: There is no significant relationship between ICT-Based Technology and Data management in Nigerian Tertiary Institutions.

Hypothesis Three: There is no significant relationship between Researchers knowledge in ICT and utilization of ICT-Based Technology in data management.

Scope of the Study

The emphasis on this project is sustainable roles of ICT-Based Technology in research work and data management in Nigeria Tertiary Institution, means that the researcher will concentrate on the assessment of the ICT-Based Technology

and application by students of tertiary institution in research work. This project is limited to some tertiary Institution in Oyo State, because the researchers have similar objectives for making use of ICT-Based Technology resources in their Academic Institutions.

ICT-Based Technology in Research Work

The application of ICTs in academic research has full-fledged grown progressively in the past few years in both developing and developed countries, although there are wide variations in usage both within and between countries and regions. It is particularly powerful and uncontroversial in higher education's research gathering. The use of this ICT is due to the unique evolution in bandwidth and computing supremacy which provide opportunities for analyzing big data and performing multifaceted computations on them in a manner that is exceptionally fast, correct and dependable. Computer data processing not only frees researchers from the awkward task of manually evaluating data but more importantly expedites rapid and accurate enquiry of huge amounts of data from domestic samples or even multi-national samples covering thousands of respondents. This ICT in research is the use of online full text databases and online research libraries or virtual libraries for research work for project students and managing data cloud data and data mining. The application of ICT in research has equipped researchers in the University of Cape Town (UCT) with world-class expertise and facilities in the: collection and management of research data; modeling, simulation and data processing through high-performance computing; comprehension of big data through visualization and data science techniques; dissemination of research outcomes (including data and workflows); promotion of collaborative research through virtual labs and cloud resources; and the development of customized research software, hardware and services (University of Cape Town, 2016). This innovation is to provide students, faculty and the university community applications and services that can assist them in their research endeavours. Consequently, the rates at which ICTs are utilized by African universities have positive impact on the level of patronage to electronic materials and applications by academics, students and researchers (Moahi, 2009). It can be said that the adoption of ICT in research contribute immensely to the realization of

institutional goals through the provision of adequate, timely and effective information to students, faculty and the university community.

These databases and libraries provide researchers with online access to the contents of hundreds of thousands of books from major publishing houses, research reports, and peer-reviewed articles in electric journals. Thus, people in different age groups and jobs, students and academicians who do scientific research and prepare projects prefer using the Internet because it is the easiest, fastest, and cheapest ways of accessing necessary information (Cloud, 2001). Even though the Internet is a very important and indispensable source for students, the issue of whether the referenced source is trustworthy and/or credible, has been raised. This is because there is no control on any particular piece of information published through the Web, in opposition to the scientific and professional journals published by the scientific institutions, business world and the organizations known to the public. Many of the sites on the Internet enable anybody to submit any kind of information without being controlled, and many of the sites known as reliable are restricted to open access for commercial purposes or security requirements and this limits the accessibility for students and deprives them of these sites. (Metzger, 2007).

According to UGCNET (2020), ICT in higher education is not only used in research and research works, but also be used in developing online course material, delivering study content and sharing content with remotely located students communication between learners, teachers and outside world, creation and delivery of presentation and lectures, academic research, administration support enrolment, test, evaluation and many more.

UGCNET (2020) opined that ICT helps researchers in the following research-related tasks:

- Identify research areas and identify appropriate sources through searching various online portals.
- Literature survey and critically analysis known information for further reading
- Choose methods for research
- Use the information to extend and communicate knowledge across subject area fields with the wide community.
- Data collection and management of information
- Referencing

- Present/share/disseminate instantaneous information exchange despite geographical distance, cost less accumulation of data and documents
- Search multiple databases and electronic resources simultaneously.
- Retrieve results in a common format to consume
- Link to other individual databases for more specialized searching.
- Select favourite resources and e-journal, save searches and record, and set up email alerts.

Roles of ICT in Research and Higher Education academic Work

According to UGCNET (2020), there are four major areas that ICT can be made use of in research work which are;

1. ICT has changed the way the researcher communicates with other parties
2. It allows information to be shared quickly and easily across the globe
3. ICT gives room for simulation through virtual laboratory and robotic experiments
4. It permits various tools and technology for feedback and evaluation.

Available Resources for Research Work

According to Somekh and Lewin (2009), the methods of using academic resources, especially the ability to scan the articles for information is very important for academic research studying. Somekh and Lewin (2009) identified academic journal database which is related to the number of periodicals covered and the evaluation techniques of them in order to form a universal academic index. They provide a rich source of specialized information, and are widely used by many academics and students, search engines which according to Blok (2002), are open access sites and are the most widely used resources for students' projects. Many of them have open access on Internet Explorer programs, but some are customizable tools supplying multiple search engines like "Copernic". Resources which are accessed through these engines are mostly used by students for gathering the required information for their projects and electronic libraries which offer an important advantage in accessing information required from related sites are classified into two different groups: open or closed access web sites of universities, and other web sites which are completely open through the Internet and that these collections are ideal for the

undergraduate/graduate students, researchers, and academicians (Farahani, 2008). UGCNET (2020) equally revealed that digital tools help researchers in finding an interesting facts such as search engine and research papers, shared dataset and code, connect and communicate with experts and researchers (academia, net, AcademicJoy, Open science framework), Free Digital Library (The National Digital, Library of India, Internet Archive, NROER), Simulation and Project Management, write and publish research papers.

ICT-based Technology for Data management

According to Cox (2008), Research data management (or RDM) is a term that describes the organization, storage, preservation, and sharing of data collected and used in a research project. It involves the everyday management of research data during the lifetime of a research project (for example, using consistent file naming conventions). It also involves decisions about how data will be preserved and shared after the project is completed (for example, depositing the data in a repository for long-term archiving and access). There are a host of reasons why research data management is important which include; data like journal articles and books, is a scholarly product, data (especially digital data) is fragile and easily lost, there are growing research data requirements imposed by funders and publishers, research data management saves time and resources in the long run, good management helps to prevent errors and increases the quality of your analyses, well-managed and accessible data allows others to validate and replicate findings, research data management facilitates sharing of research data and, when shared, data can lead to valuable discoveries by others outside of the original research team (Cox, 2008).

According to Kerstetter (2018), data management systems provide the key to utilizing data in its many, various forms. According to this writer, it is a well-recognized fact that the volume of data has increased far faster than most institutions ability to process it and this glut of data has crippled some executives, with 61 percent of managers reporting an information overload at their workplace. This data may be structured data which is highly organized information that can already be easily indexed, uploaded into databases, and detected by search operations or algorithms. Structured data usually consists of objective, numerical information that does not require interpretation. It equally tends to describe moments in time that can be distinct and accountable when

and where a purchase took place, or at what point a machine reached a certain level of production. Also, it may be unstructured data which is a kind of catch-all phrase describing data that resists easy indexing and may not conform to existing database organizations. This unstructured data is human-generated and often language-based, and as such, tends to be less focused, harder to categorize and tends to reveal more about opinion, emotion, and relationships between customers and products. Examples of unstructured data include: Information contained in emails, Audio and video files, Blogs and wikis, Postings on Twitter, Facebook, Instagram and other social media platforms. Mateen (2011) opined that Database Management System (DBMS) is a kind of software that is used to manage database systems

Methodology

Research Design

The descriptive research design of the survey type was used for this study. This will investigate and observe the sustainable roles of ICT-Based Technology and data management in research work in Nigeria Tertiary Institutions.

Population of the study

The population of the study consists of the 535 student researchers in Tertiary Institutions in Nigeria.

Sample and Sampling Techniques

The samples for this study consists of the students in tertiary institutions of Nigeria, and the samples were randomly selected. A well designed questionnaire was used for the collection of data in the study. The questionnaire which consists of two sections (i.e. section A and B) Section A deals with the personal data of the respondents while section B consists of 15 items used to assess the sustainable roles of ICT-Based Technology and data management in research work in Nigerian Tertiary Institutions. 520 participants responded and the analysis was based on these number.

Validity of the Instrument

The face and content validity of the questionnaire was ascertained by specialist in the field for correction and modifications of ambiguous items before the

questionnaires were administered. Samples of one hundred respondents were selected apart from the selected sample and were administered on them to carry out test-retest analysis. The reliability coefficient was calculated to be 0.86 using the Kuder-Richardson formula on the data collected. The remaining questionnaire was administered online by the researcher through whatsapp platform. In the analysis of the data, responses from all the item of the questionnaire were taken one after the other and the numbers of the respondents that responded to each item were counted and analyzed using Chi-square statistical tool.

Method of Data Analysis

The questionnaire was administered to the respondents by the researcher through the assistance of the course representatives who were properly educated on the instrument. The responses to each question were presented in frequencies and percentages. The non- parametric chi- square statistic (X^2) was used to test the hypothesis at 0.05 level of significance.

Table 2: Programme of the Respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
valid	Bsc	99	19.0	19.0	19.0
	HND	56	10.8	10.8	29.8
	NCE	205	39.4	39.4	69.2
	ND	160	30.8	30.8	100.0
	Total	520	100.0	100.0	

Source: Field Survey, 2021

From Table 1 above, the result of the findings shows that 99 respondents representing 19.0 % of the students were B.Sc., 56 respondents representing 10.8% of the students were HND, 205 respondents representing 39.4% of the students were NCE, and 160 respondents representing 30.8% of the students were ND. As indicated in table 1 above, this shows that the majority of the respondents were NCE.

Table 2: Level of the Respondents

		Frequenc y	Percent	Valid Percent	Cumulative Percent
Valid	100L	81	15.6	15.6	15.6
	200L	143	27.5	27.5	43.1
	300L	154	29.6	29.6	72.7
	400L	142	27.3	27.3	100.0
	Total	520	100.0	100.0	

Source: Field Survey, 2021

From Table 2 above, it was observed that the four levels were used that is 100 to 400, the result of the findings shows that 81 respondents representing 15.6 % of the students were from 100L, 143 respondents representing 27.5 % of the students were from 200L, 154 respondents representing 29.6 % of the students were from 300L, 142 respondents representing 27.3 % of the students were from 400L. As indicated in table 2 above, this shows that the majority of the respondents were from 300L.

HYPOTHESIS TESTING

Hypothesis One: There is no significant relationship between ICT-Based Technology and Research work in Nigeria Tertiary Institution.

S/N	ITEMS	SA	A	D	SD
1.	ICT based Technology is used for research work in Nigeria tertiary institutions.				
2.	ICT-based Technology helps to fasten and quicken research works in Nigeria tertiary institutions due to its high speed of performing operation.				
3.	ICT based Technology only cannot be used to carry out some research work in Nigeria tertiary institutions.				
4.	ICT based Technology are mostly found in all Nigeria tertiary institutions mainly for research work				

5. ICT based Technology does not improve the research methods in Nigeria tertiary institutions because of some distraction attached to it.

Table 3: Chi – square analysis on hypothesis one

Valid Response	Frequency	Percent	X ²	Table Value	Df.	Remark
SA	52	10.0				
A	69	13.3				
D	195	37.5				
SD	204	39.2	31.5	5.345	6	Significant
Total	520	100%				

Source: Field Survey, 2021

$X^2 = 31.5$, $df = 6$, $P < 0.05$, from Table 3 above, the results reveals that 52 of the respondents strongly agreed and 69 of the respondents agreed that there is no significant relationship between ICT-Based Technology and Research work in Nigeria Tertiary Institution. While 195 of the respondents disagreed and 204 respondents strongly disagreed. The calculated chi- square X^2 value of 31.5 is greater than chi-square Table value of 5.345 at 0.05 alpha level significance, since the chi square table value is less than calculated value, therefore, null hypothesis stated that there is no significant relationship between ICT-Based Technology and Research work in Nigeria Tertiary Institution is hereby rejected while alternative hypothesis stated that there is significant relationship between ICT-Based Technology and Research work in Nigeria Tertiary Institution is accepted.

Hypothesis Two: There is no significant relationship between ICT-Based Technology and Data management in Nigeria tertiary institutions.

- 1. ICT based Technology and Data Management in Nigeria Tertiary Institutions are two sides of the coin.**
2. ICT based Technology helps mostly in Data Management in Nigeria tertiary Institutions.

3. ICT based Technology makes the data in Management to be valid, reliable and accurate.
4. The condition of ICT based Technology in Data processing in Nigeria tertiary institutions is nothing to write home about.
5. ICT based Technology in Nigeria Tertiary Institutions move beyond digitalization of information and record keeping.

Table 4: Chi – square analysis on hypothesis two

Valid	Response	Frequency	Percent	X ²	Table Value	Df.	Remark
	SA	68	13.1				
	A	86	16.5				
	D	135	26.0				
	SD	231	23.1	11.2	7.251		
	Total	520	100%			5	Significant

Source: Field Survey, 2021

$X^2 = 11.2$, $df = 5$, $P < 0.05$, table value 7.251, the results reveals that 68 of the respondents strongly agreed and 86 of the respondents agreed that there is no significant relationship between ICT-Based Technology and Data management in Nigeria tertiary institutions. While 135 of the respondents disagreed and 231 respondents strongly disagreed. The calculated chi- square X^2 value of 11.2 greater than chi-square table value of 7.251 at 0.05 alpha level significance, since the chi-square Table value is less than calculated value, therefore, null hypothesis stated that there is no significant relationship between ICT-Based Technology and Data management in Nigeria tertiary institutions is hereby rejected while alternative hypothesis stated that there is significant relationship between ICT-Based Technology and Data management in Nigeria tertiary institutions is accepted.

Hypothesis Three: There is no significant relationship between Researchers ICT knowledge and utilization of ICT-Based Technology in data management.

1. ICT based Technology is not only useful in Data Management and research works but also in other academic fields.

2. ICT based Technology knowledge in Data Management in Nigeria tertiary institutions makes the accumulation of gathered results more convenient to analyze and explain.

3. ICT-knowledge enhance the researchers to handle computer-based interpretation of data to yield information

4. ICT based Technology utilization in Data Management in Nigeria tertiary institutions influences the researchers' chance in getting the research done as expected.

5. The researchers are equipped with adequate ICT knowledge which determines how effectively ICT-Based Technology is used in data management.

Table 5: Chi – square analysis on hypothesis three

Valid	Response	Frequency	Percent	X ²	Table Value	Df.	Remark
	SA	47	9.00				Significant
	A	81	15.6				
	D	176	33.9				
	SD	216	41.5	26.4	7.14	6	
	Total	520	100%				

Source: Field Survey, 2021

$X^2 = 26.4$, $df= 3$, $P<0.05$, table value 7.14, the results reveals that 47 of the respondents strongly agreed and 81 of the respondents agreed that there is no significant relationship between Researchers ICT knowledge and utilization of ICT-Based Technology in data management. While 176 of the respondents disagreed and 216 respondents strongly disagreed. The calculated chi- square X^2 value of 26.4 greater than chi-square Table value of 7.14 at 0.05 alpha level significance, since the table value is lesser than calculated value, therefore, null

hypothesis stated that here is no significant relationship between Researchers ICT knowledge and utilization of ICT-Based Technology in data management is hereby rejected while alternative hypothesis stated that here is significant relationship between Researchers ICT knowledge and utilization of ICT-Based Technology in data management is hereby accepted.

Discussion of Findings

The analysis showed that most researchers perceive the use of ICT applications in research works as very important. This means that the use of technology in research is essential in 21st century research. This finding is line with the findings of Meyer and Dutton (2009) that are of the view that most researchers were interested in using technology for research. This implies that the use of ICT in research was very relevant in their research activities. Students in universities were very receptive in using new technologies to enhance and facilitate their research.

Moreover, majority of the students intimated that the ICT facilities their institutions provided met their research needs. This denotes that the use of ICT applications in research was useful. This finding is similar to that of (Balanskat, Blamire, and Kefala, 2006) which noted that researchers believed that ICT facilities used in research foster more collaboration, data sharing and working with large datasets. Thus, academic institutions should provide more ICT facilities to students so that they can employ them in their research.

Furthermore, from the data analysis, it was revealed that the main reasons why researchers accessed or used ICT applications are for quick access to information, convenience of access to information, time saving, and currency of information accessed. This supports the findings of (Somekh, 2009) that most researchers used ICT facilities in their research because of ease of use, enhancement of their personal productivity and usefulness in scientific enquires. It is therefore paramount for universities to invest more in ICT infrastructure and facilities that can enhance students and researchers learning and research activities. Additionally, universities should be more proactive in identifying students research needs so that relevant ICT applications can be provided.

Summary

The finding revealed that there is specific relationship between ICT-Based Technology and Data management in Nigeria tertiary institutions as some of the

respondents in their reply showed their heart felt against the poor data management in Nigeria Institutions. It was discovered that most of institutions in Nigeria lack proper or unique keeping of record and there are some research work in the past that knowledge can easily be drawn out from but such heroes and heroines research works lack data management. It is necessary to implement the use of ICT based Technology in keeping the record and mainly as a means of data management. On the other hand, the researcher discovered that there is significant relationship between Researchers ICT knowledge and utilization of ICT-Based Technology in data management, the result of the analysis disclose the fact that most of the respondent lack ICT operations skills, which cause their inability to effectively utilize ICT based technology in data management.

Conclusion

Based, on the following and the field experience in this study, it is concluded that the inclusion of ICT based technology in carrying out research works in institution will go a long way in assisting researchers' good performance in their research field. Also, using of information and communication technology will be effective to a high extent increase in the enhancement of question-making skill, enforcement of research spirit and improvement on educational system of higher institutions. Furthermore, ICT based technology makes easier research work, probably because they use them in a more general and systematic way and it is a key factor for innovations, teaching and improvement of research works and data management

Recommendations

In view of the result of the study, the following recommendations are made:

1. Corporate of interdisciplinary research on how ICT can be used effectively in research works, learning process and management of big data online should be structured.
2. The use of ICT to stimulate the memory process, leading to effective research conducting
3. Researchers must learn new skills that would enable them to adapt to a new and challenging teaching environment.

4. There should be a serious need for government to strongly support and institutional commitment to ensure effective provision of adequate ICT infrastructure in schools for both research work and data management.
5. Organization of enlighten programme on the effective use of ICT based technology and that the researchers are to undergo time-to-time trainings/workshop on the handling of ICT files.

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