



Usage and Challenges of Information Communication Technology (ICT) in Higher Education Institutions

Suruchi Srivavastava, Research Scholar, Department of Business Administration, DDU Gorakhpur University,

Dr. Sanjay Baijal, Professor, Department of Commerce, DDU Gorakhpur University,

Dr Suman Kannoujia, Asstt. Professor, Department of Commerce, DDU Gorakhpur University

ABSTRACT

This study examined the concept of Information Communication Technology (ICT), its relevance and usage in Higher Education Industries (HEIs). The challenges of ICT on learning process in state universities were discussed using descriptive survey, unstructured interview, observations and participatory experience. The study revealed that ICT is effective tool in improvement of overall quality, performance, knowledge and skills. It also revealed that traditional classroom teacher factor, digital reluctant attitude, box of colored- chalk, inadequate funding, management attitudes, inadequate of internet connectivity/ infrastructure, energy related were some of the challenges of ICT in teaching and learning process in State Universities. Recommendations made were that all employed teachers in federal, state and private universities should undertake mandatory training and retraining on ICT programmers. This is to provide them with practical and functional knowledge of computer, internet and associated areas of ICT for improved effectiveness and efficiency. Government should develop ICT policies and practices that would support lecturers in their academic work and students in their learning. ICT tools should be made more accessible to all the students and staff. Also, digital divide should be bridged within and between the staff of universities, teaching should move from the box of colored chalk to e-learning. All hands, that is, government, parents and Non-Governmental Organization (NGO) must be on deck towards computerization of Indian universities, the globalization of education and network education management.

Today, improved communication technology has made time and space less complex. It could be observed that this modern age is the age of information explosion in which an average individual wants to explore the information system. Thus, the ability for timely acquisition, utilization, communication and retrieval of relevant and accurate information has become an important attribute for better teaching-learning process.

Advanced and developing countries have also attested to the fact that ICT is a central focus for the educational policies, for use and integration in our school curriculum, yet Indian educational system has not adequately exposed students, teachers and institutions of learning to the realities of ICT tools and skills that would prepare them to face the challenges of the global world of internet and knowledge sharing within the shortest possible time. Adegun (2007) revealed that presently in India, the use of e-learning in the educational sector is still at the rudimentary stage. The educational system is the formal education, classroom based instruction where the teacher and students are physically present at the same time and at the same place. The teacher uses the traditional method of teaching in addition to some manual instructional materials for teaching. Because of the relevance of ICT to teachers in the implementation of school curriculum, it is argued that teachers should be adequately prepared, trained and equipped with relevant ICT tools/skills such as computer-mediated communication, internet, electronic publishing, video conferencing, multi media (Cornu⁴, 2002; Joassen and Reeves, 1996; Olorundare⁹, 2006).

Indian Government has made some efforts towards the provision of basic tools for teaching/learning and application of ICT to Higher Education Institutions.

UP Free Laptop Yojana 2023 - A budget of ₹1,800 crores has been set aside by the state of Uttar Pradesh for the free laptop initiative for Students. The state's chief minister, Shri Yogi Adityanath, launched the UP Free Laptop Scheme 2023 as a response to the needs of academically brilliant students who lack the funds to buy the devices they need. UP government distributes laptops, smartphones to students under Swami Vivekanand Yuva Shashaktikaran Yojana-

Keeping in view the importance of digital empowerment the government is distributing tablets to the students of U.G. and P.G. diploma, skill development, paramedical and nursing education: Uttar Pradesh Higher Education Minister.

The Free Smartphone Tablet Yojana 2024 was started in Uttar Pradesh in 2021 and is provided by the state government to all the beneficiaries. More than 25 lakh students will get the benefits of free tablets and smartphones in 2024. Approximately more than 12.35 lakh students will get the benefits of free tablets and smartphones in this **Free Smartphone Tablet Scheme 2024** in march 2024.

Therefore, there is the need for effective and efficient use of ICT to generate information for good decisions and productivity.

On the basis of the above, the paper is guided by the two hypotheses below for which primary survey was conducted and 250 respondents were analysed:

1. The efficient and effective management of student learning, curriculum development research work and administrative functions in Higher Education Universities is significantly correlated to the efficient and effective application of Information Communication Technology (ICT) in the Universities.
2. Poor application of information communication technology (ICT) in Higher Education Universities significantly correlates with the low motivation, less knowledge and interest in technology, insufficient training, less accessibility, structural, operational, economic and socio-cultural issues in the Universities.

INFORMATION COMMUNICATION TECHNOLOGY – AN OVERVIEW

The challenges of the college system in the 21st century will be incomplete if the demand for ICT is not met. ICT is a broad term that has to do with the harnessing of process, the methods and the product of electronic and communication: related technologies for enhancing the productivity, the spread and efficiency of a set of programmed activities geared towards the achievement of clearly determined goals. Bamdele³ (2006) defined Information and Communication Technology as it encompasses a range of 'new' technologies and their application including all aspects of the use of computers, microelectronic devices, satellite and communication technology. The National Policy for Information Technology (2001) defined IT as computer, auxiliary equipment software and firm ware (hardware), procedures, services and related resources. The document described ICT as any equipment or interconnected system of equipment that is used in the automatic acquisition, storage, manipulation, management, control, display, switching and transmission of information. In another related concept, ICT is conceptualized as communication in whatever forms used, accessed, relayed and transmitted to communication or send and received information (Olorundare⁹, 2006). In this context ICT are tools that comprise electronic devices which are utilized for information and communication needs of institution, organization, students and individuals. Such electronic devices include computer (hard and software), networking, telephone, video, multimedia and internet. Application and utilization of these devices converts information, text messages, sound and motion to common digital form. ICT provided students and teachers with practical and functional knowledge of computer, internet and other associated area of ICT. In the classroom situation, communication process influence learner's behaviors through interaction. For instance, in all science subjects, students record their practical experiments, observations, demonstrations in both formal and informal text or present their findings/discovery in either oral or written reports.

Therefore, to prepare students for information age and competitiveness and communicate effectively in the 21st century, complete internet/intranet services should be made available 24 hrs in all colleges in India.

RELEVANCE OF ICT IN TEACHING AND LEARNING IN HIGHER EDUCATION INSTITUTIONS

The functions of teaching in education process is considered paramount especially when we consider teaching and learning process as the acquisition of knowledge and skills by individuals to enable him become useful member of the society. Indeed, teaching may convey and at times actualize the objectives of education of the learner. It involves deliberate activities geared towards the development of less matured and inexperienced. Teaching embraces forms of process, behavior and activities which do not succumb to explanation by a single theory. It is also, argued that in educational institutions teaching cannot take place without the students (learner), the teacher, the curriculum, content and instructional materials. The above judgment may not stand the test of Information Age/ICT. This is because teaching imposes content, learner's freedom is restricted, while ICT employs independent judgment in decision making, this is seriously eroding teaching situations. The only main task of the teacher is to create enabling environment that may bring

about desirable change in behavior.

At the classroom situation, ICT is utilized to enhance teaching effectiveness. It is a challenging process that involves 3 levels: Macro, Meso and Micro. The macro level determines National Policy on IT and Education outlines various educational information technological needs of the society and the implementation digesting and translating the policy into practice. The micro level is the implementation procedure using the curriculum through various skills of interaction, observation between the teachers and the learners, the content of instructions and ICT tools.

Therefore, classroom teachers are expected to utilize ICT facilities to inculcate relevant knowledge to students. Any classroom teachers with adequate and professional skills in ICT utilization will definitely have his students perform better in classroom learning.

USAGE OF ICT IN TEACHING AND LEARNING PROCESS

Accessibility: ICT makes records and information about higher education institutions activities easily accessible, fast and regular. It gives room for unrestricted access to teacher and students for relevant information and development in various subject- areas. Access to latest textbooks, journal books published by reputable scholars in various disciplines is guaranteed.

Table: Accessibility of information

Accessibility of information	Frequency	Percentage
Strongly Agree	105	42
Agree	83	33
Neither Agree Nor Disagree	37	15
Disagree	18	7
Strongly Disagree	7	3
	250	100

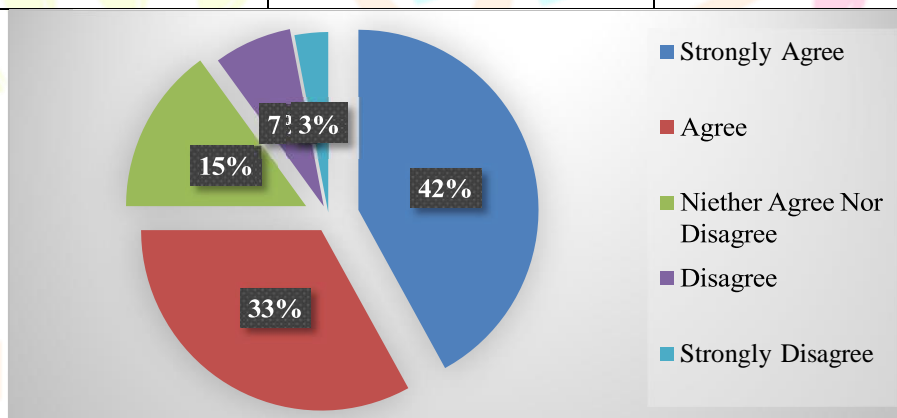


Figure: Accessibility of information

Table The data indicates a substantial agreement, with 42% strongly agreeing and an additional 33% agreeing that information is highly accessible. The ease with which individuals can access information, is likely influenced by the advancements in Information Communication Technology (ICT) and digital platforms. Meanwhile, 15% neither agree nor disagree, indicating a level of neutrality or uncertainty among respondents regarding the accessibility of information. On the contrary, 7% disagree, and 3% strongly disagree with the statement. These findings suggest a prevailing belief within the surveyed population that information is generally easy to access, reflecting the impact of digital technologies in creating more open and interconnected information landscapes. The insights derived from this table have implications for educators, information professionals, and technology planners, highlighting the importance of maintaining and improving the accessibility of information, addressing potential barriers, and ensuring that diverse populations can benefit from the digital availability of knowledge.

ICT as an evaluative tool: Other areas of ICT utilization include evaluation of learning outcome and classroom management. ICT facilities could be used to prepare lesson plan, write students report, storage of data, collect and analyze student's achievements. Curriculum content could be enriched through search in internet by teachers or curriculum experts. Recent research findings in any particular subject area could be easily obtained through internet. ICT do not only bring about improvement in what is taught in the classroom but encourage personal and professional advancement. ICT encourages active participation in classroom interaction as knowledge is shared (Emenike, 2003). Hence, ICT gives room for modern method of assessment and evaluation of students' performance.

ICT as an improvement of knowledge and skills: The use of ICT in classroom situation sees the teacher as facilitator rather than dispenser of knowledge. Teachers serve as guide in teaching and learning. Some of the ICT commonly used in classroom for educational purposes include lap top computer, local area network (confines in a particular classroom building) and the internet. The computer has the capacity to put text, graphics, and pictures on screen and accept students input, which can be easily retrieved and analyzed. The internet provides e-mail services generally utilized for correspondences and dissemination of information.

Table: ICT Plays vital role in improving faculty knowledge, skills and abilities

ICT Plays vital role in improving faculty knowledge, skills and abilities	Frequency	Percentage
Strongly Agree	98	39
Agree	60	24
Neither Agree Nor Disagree	42	17
Disagree	30	12
Strongly Disagree	20	8
	250	100

Figure: ICT Plays vital role in improving faculty knowledge, skills and abilities

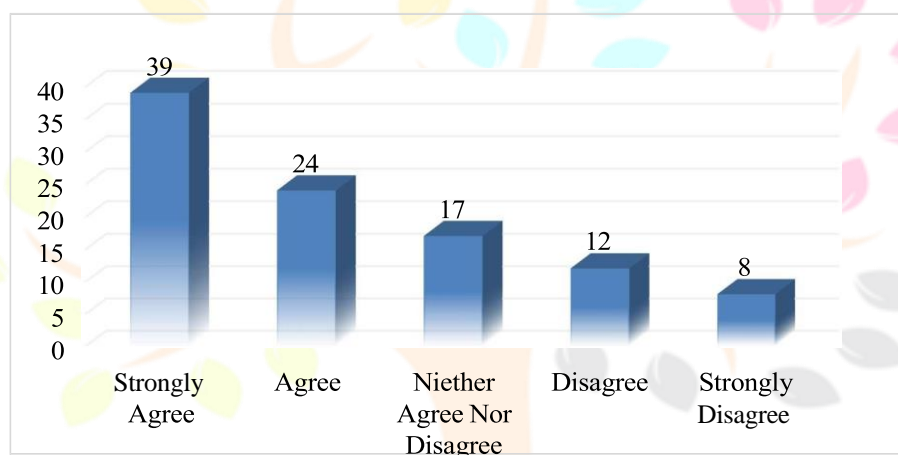
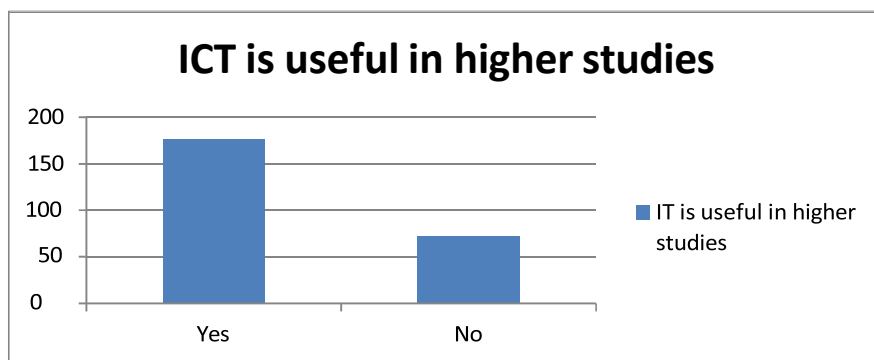


Table examines the perceptions of the surveyed population regarding the role of Information Technology (ICT) in improving faculty knowledge, skills, and abilities. The data indicates a significant agreement, with 39% strongly agreeing and an additional 24% agreeing that ICT plays a vital role in enhancing faculty members' knowledge, skills, and abilities. This collective agreement underscores the perceived positive influence of technology in facilitating professional development and continuous learning among academic staff. Meanwhile, 17% neither agree nor disagree, indicating a level of neutrality or uncertainty among respondents regarding the impact of ICT on faculty improvement. On the contrary, 12% disagree, and 8% strongly disagree with the statement, forming a minority within the sample who do not view ICT as a significant factor in improving faculty knowledge, skills, and abilities. These findings suggest a prevailing belief within the surveyed population that ICT is instrumental in supporting and advancing the professional growth and capabilities of faculty members in educational institutions. The insights derived from this table have implications for educational administrators, professional development planners, and policymakers, emphasizing the potential of ICT to contribute to the ongoing enhancement of faculty expertise and effectiveness in delivering quality education. ICT provides new opportunities to explore high level cognitive activities such as, autonomy, creativity, problem solving and teamwork. It equally provides with the means to take into account individual needs of students especially, while using web based technology.

Table: ICT is useful in higher studies

IT is useful in higher studies	Frequency	Percentage
Yes	177	70.8
No	73	29.2
	250	100

Figure: ICT is useful in higher studies

The presented data articulates respondents' perspectives on the utility of Information Technology (ICT) in higher studies. A resounding 88% of the surveyed individuals affirm the affirmative stance, expressing that ICT is indeed beneficial in the context of higher education. This overwhelming endorsement underscores the widespread recognition and acceptance of the positive impact that Information Technology has on enhancing and facilitating higher studies. The 12% of respondents who hold a contrary view, expressing that ICT is not useful in higher studies, represent a smaller but noteworthy minority within the sample. This divergence in opinions could be attributed to various factors, such as differing levels of familiarity or comfort with technology, variations in educational contexts, or individual preferences. Nevertheless, the dominant consensus in favor of the usefulness of ICT in higher studies suggests a general acknowledgment of its pivotal role in modern education. These findings have implications for educational institutions, policymakers, and technology integrators, highlighting the importance of leveraging ICT tools and platforms to enhance the quality, accessibility, and overall effectiveness of higher education.

USAGE OF ICT IN CURRICULUM DEVELOPMENT – IMPLEMENTATION AND EVALUATION

Curriculum content could be enriched through search in internet by teachers or curriculum experts. Curriculum Development is the step-by-step process of designing and improving the course offered at schools, colleges and universities. Even though each institution will have its own process, the broad stages of the framework consist of analysis, design, implementation, and evaluation. Curriculum refers to specific lessons and academic content taught in schools and educational institutes for a particular course or program. On the other hand, curriculum development is a process that aims to improve the curriculum by using various approaches. Few of the commonly used techniques include need and task analysis, objective design, choosing appropriate teaching and learning methods, choosing assessment methods, and forming the curriculum committee and curriculum review committee.

ICT has increase importance within the college curriculum. Not only does it support teaching and learning within other curriculum subjects, but it is also a subject in its own right. Developing skills, knowledge and understanding in the use of ICT prepares pupils to use such technologies in their everyday and working lives. Teacher too will be able to change and update material on a web-page based on new information or new needs of the learner. The use of ICT provides opportunities for pupils to work both collaboratively and independently, to consider which ICT tools best suit the task in hand and to know when and when not to use ICT to complete such a task.

As such, the role of ICT within the curriculum is not only to enhance the learning experiences of pupils but also to help them develop the skills essential to participate effectively, both now and in the future. This study look at a very important, current and concern issue of curriculum development, implementation and evaluation with the use of ICT for the achievement of education for sustainable development. Higher Education Institutions face challenges in integrating ICT into the curriculum to achieve sustainable development. In conclusion, the ultimate aim of ICT adoption now is to facilitate effective transformation of learning. Integration of ICT with learning should be curriculum driven instead of technology driven in view of future curriculum reform. One thing that is observed nowadays is that many programs design at all education levels are for the purpose of contributing to the attainment of sustainable development. The implementation of these programs should entails building a culture among people. It must be a matter of inculcating values and shaping of attitudes and impartation of knowledge and development of skills. Basically, therefore, emphasis should be placed on the effectiveness ICT in promoting sustainable education at all levels. To overcome challenges identified in this paper particularly in higher education institutions, development of ICT experts who are able to tackle ICT projects successfully in both the private and public sector is highly necessary. The need has arisen for teachers of the new curriculum to be retrained in the use of ICTs to create and develop different activities to cater for different needs of individual learners.

Table: IT qualifies curriculum development process

ICT qualifies curriculum development process	Frequency	Percentage
Strongly Agree	105	42
Agree	75	30
Neither Agree Nor Disagree	38	15
Disagree	25	10
Strongly Disagree	7	3
	250	100

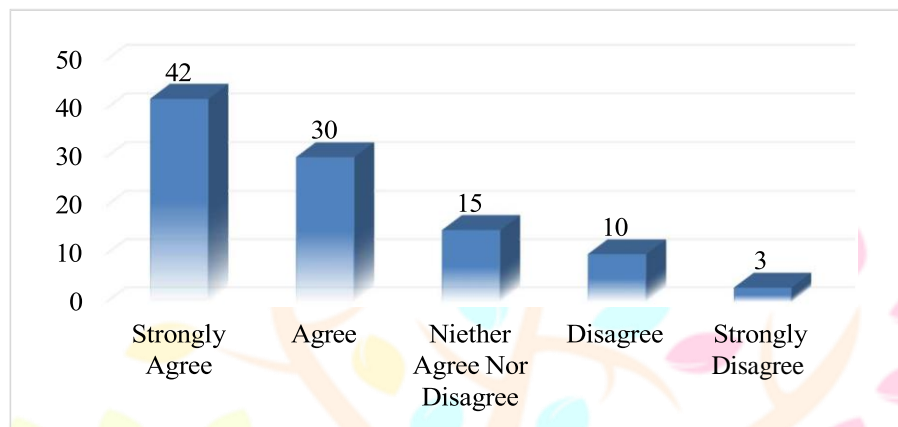
Figure ICT qualifies curriculum development process

Table explores the perceptions of the surveyed population regarding the qualification of the curriculum development process by Information Communication Technology (ICT). The data indicates a substantial agreement, with 42% strongly agreeing and an additional 30% agreeing that ICT significantly qualifies the curriculum development process. This collective agreement underscores the perceived positive influence of technology in enhancing and streamlining the development of educational curricula. Meanwhile, 15% neither agree nor disagree, indicating a level of neutrality or uncertainty among respondents regarding the impact of ICT on the curriculum development process. On the contrary, 10% disagree, and 3% strongly disagree with the statement, forming a minority within the sample who do not view ICT as a significant factor in qualifying the curriculum development process. These findings suggest a prevailing belief within the surveyed population that ICT plays a crucial role in improving the efficiency, adaptability, and overall quality of curriculum development in educational institutions. The insights derived from this table have implications for curriculum designers, educational administrators, and policymakers, emphasizing the potential of ICT to contribute to the qualification and advancement of curriculum development processes in response to the dynamic needs of learners and the evolving landscape of education.

CHALLENGES OF ICT IN TEACHING AND LEARNING PROCESS IN HIGHER EDUCATION INSTITUTIONS

In spite of the accompanying gains and clarion call for full introduction and utilization of ICT facilities in our school system, there are still serious inhibiting factors encountered in the implementation of the policy at institutional and classroom level. Such factors are:

Over the years now, government intention is to provide facilities and necessary infrastructure for the promotion of ICT at all levels of education. This intention has not been met because of some inhibiting factors include inadequate computer trained and certificated teachers in our school system. Absence of trained teachers in computer science to teach students practical aspects of computer skills and non-availability of computer and allied tools in school all put together militate against actual utilization of ICT in our school system.

Not until the National Research Development Council (NRDC) reviews the 4th edition of the National Policy on Education and integrate ICT into the curriculum the problem shall continue to sway again. Most teachers in the school system (primary and secondary) play avoidance techniques in the utilization approach. They distance themselves from any related computer related activities and training. They also rely on traditional methods of teaching. Such distance may be as a result of fears, ignorance, negative perception or inferiority complex. The teacher factors problem presupposes an urgent need for all employed and practice teachers to brace up with the challenges of ICT and use ICT tools and skills to their advantage. Onuma (2006) remarked that as important as ICT devices are, they should be seen as tools, teachers can use to help students to be more productive and successful in learning. The successful implementation of any curriculum is dependent on the informed and rationale choice the classroom teacher makes about curriculum programmes and materials required for use in college.

Inadequate funding: Inadequate funding is directly on the part of the government. Low level funding in school is as a result of inadequate budgetary allocation. ICT equipment or accessories, soft and hardware are costly. Investment in ICT educational services is also at a low level. Few available computers in higher institutions cannot serve all the students. Secondly, institution use available one supplied.

Management attitudes: The attitudes of various managements in and outside institutions towards the development of ICT related facilities such as the internet and procurement of computers is rather slow in some instances and in others there are no aids or support by the government (Peter, 2007).

Inadequate of internet connectivity: Again there is also low of internet connectivity in India. To achieve the aim of the National policy on education with regard to students becoming computer literate, ICT should be placed as a project by the government with corresponding funds available to train and retrain teachers on computer usage (Adebayo, 2007).

Energy related problems: Power supply all over the country appears erratic. All ICT tools depend heavily on steady supply of electricity if there are to function effectively. In urban cities, where there are power supplies, it is irregular and regularly interrupted. Interrupted power supply disrupts actual utilization of ICT services. The negative effect of erratic power supply in India makes ICT dysfunctional.

Low tele-density: Low Tele-Density is another major problem of ICT utilization in India. Access to telecommunication tools such as telephone, computer, internet among others still at low ebb. With infusion of Global System for Mobile (GSM) telecommunication, utilization of ICT resources for educational purposes is still low (Abolade, 2005; Onuma, 2006).

Digital divide among university staff: Digital divide is described as discrimination against the ICT usage between countries, cultural, religion, family, rich and poor, urban and rural dwellers, geographical spread, race, gender and vulnerable group (disabled). Most of the Indian universities discriminate against gender. Men are usually sent for workshop training, induction course, seminar on ICT usage. In some universities, the senior staffs are entitled to ICT facilities, while the junior staffs are not given the ICT tools. This may have influence on the teaching-learning process since men would be able to use ICT facilities in dispensing knowledge than women.

Box of colored chalk: In Indian universities, teacher's presentation in the classroom is often by chalk and talk method. Teachers are seen carrying the box of colored chalk to the classroom for their lessons. Today, technology had brought changes from chalk to power point, e-learning and gradually moving towards mobile learning. Implicit in this, is that universities teachers are supposed to move from the box of colored chalk to e-learning and probably to m-learning [combination of internet, computer and mobile phones) to make teaching less strenuous for teachers and the students.

Culture: Cultural Morales or imperialism of different countries determines the use of Information Communication Technology. In India context, the culture of some zones did not allow teachers to use ICT facilities believing that students could be corrupted and that it could influence their attitudes, norms and values. In order to achieve maximum impact and influence of ICT the culture of the society to which teachers belong have to be adjusted to meet the challenges of knowledge economy age.

CONCLUSION

There is no gain saying that in education sound information system will discourage guessing, rumour or gossip and thereby promotes trust, confidence and supportiveness, saves time, enhances personal confidence of the teachers and encourages him to exhibit good judgment, since the judgment are made based on hard facts and figures.

ICT therefore, in education is an indispensable tool in the modern teaching-learning process; hence its adoption for teachers will go a long way towards the enhancement of teaching and learning process. This is because issues such as good course organization, collaborative learning and effective class management will be facilitated and enhanced by the use of ICT based technology. ICT therefore, provides teachers with a structured means for presenting past, current and project information gathered from various source and on a continuous base. It is a system used to collect process and store, transmit and display information for usage. Therefore teachers should be adequately exposed to the use of ICT because of its efficacy and global focus.

RECOMMENDATIONS

To actualize ICT utilization tools and skills in Indian schools & colleges the following recommendations were made: Free and compulsory ICT services should form part of students general studies programmes in higher institutions of learning to provide students with practical and functional knowledge of computer, the internet and associated areas of ICT.

Basic knowledge of computer should be a pre-requisite condition for award of any degree. Students at all levels should be provided with basic concept of ICT by the trained teachers.

All employed teachers in public schools at all levels should undertake mandatory training and retraining of ICT programmes to provide them with practical and functional knowledge of computer, internet etc. The training should be in form of conferences, seminars and workshops to prepare teachers for information Age and competitiveness of the 21st century.

ICT installation and maintenance of its facilities is cost intensive, therefore government should vote special fund and invest honestly for successful utilization by both students and teachers.

Recently, the Indian government in her desire to explore the super highway of online education jettisoned the idea of satellite university campus initiative in the country. Towards this direction the National Information Technology Agency

(NITDA) took an action on how information technology could be spread to tertiary institutions for proper management. Hence, some universities in India started some visual university programme. College administrators, teachers and students need to be computer literate so as to be able to apply computer to administrative functions, teaching and learning.

REFERENCES

1. Abolade, A.O. and M.O. Yusuf, 2005. Information and communication technology and the Nigerianteacher education. Afr. J. Edu. Stud., 3 (10): 19-23.
2. Adebayo, F.A., 2007. Management information system for managers, Ikeja, Lagos. Atlantic AssociatedPublishers.
3. Bamdele, S.O., 2006. Development of modern ICT and internet system. University of Ado-Ekiti, Ekiti.
4. Cornu, B., 2002. E-education, Knowledge of E-knowledge? Teacher or E-teacher? Pupils or E-pupil ? In:Panizar (Ed.). 9th Edn. Perspective on the Age of the Information Society. Tampered University Press.
5. Emenike, O., 2003. Role of Information in Education Management. Enugu. JAMOE Enterprises.
6. Jonassen, D.H. and T.C. Reeves, 1996. Learning with Technology: Using Computer as Cognitive Tools.
7. Jonassen, D.H. (Ed.). 9th Edn. Hand book of Research for Educational Communication and Technology. New York: McMillan. National Policy on Information Technology, 2001. Federal Government Press, pp:1-9.
8. Onuma, N., 2006. Utilization of ICT in Schools. A Paper presented at NAEAP Conference. Enugu.
9. Olorundare, S.A., 2006. Utilization of ICT in curriculum development-implementation and evaluation. Paper Presented at the National Conference on Information and Communication Technology in the Ser- vices of Education University of Nigeria Nsukka.
10. Peter, Z.K., 2007. The imperatives of ICT for Teachers in India Higher Education.
11. Universal Primary Education Board, 2006. Training manual on record keeping and continuous assessmentfor the junior secondary schools Ekiti State, Nigeria.

