

## STUDY OF ICT (INFORMATION AND COMMUNICATION TECHNOLOGY) IN CONTEXT OF INDIAN HIGHER EDUCATION

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### ABSTRACT

*For the past twenty years, the use of ICT has fundamentally changed the practices and procedures of nearly all forms of activities within business and governance. Organizations especially educational institutions are increasingly investing in the use of information and communication technology (ICT) to support all aspects of organizational work from group work to individual teaching, training and learning. ICT is used not only for the delivery of lectures and materials, but also for administration and management purposes. Traditional libraries now converted to resource center with the use ICT. Teaching students at universities must avoid the traditional styles that students were familiar with at high school. Although ICT may be available at high schools, its use at higher education is completely different, because teaching at university level will use ICT in different ways to meet the objectives of mature students.*

**Keyword:-** ICT, University, learning, Teaching, Internet, Administration, Knowledge, Research

### Administration and ICT

Transform has been happening at an uneven pace in any growth-oriented industry, and the education sector is no exception. Educational institutions are in quest of change in order to grab up with the development of the enormous technical and technological changes and to bridge the gap between the education sector and other technical and scientific sectors. The 21st century has witnessed tremendous advancements in technology which has led to far reaching developments in the administrative system [7]. Organizations especially educational institutions are increasingly investing in the use of information and communication technology (ICT) to support all aspects of organizational work from group work to individual teaching, training and learning [12]. ICT is potentially a powerful tool for extending educational opportunities and can provide remote learning resources. ICT encourage students to take responsibility for their own learning and offers problem centered and inquiry based learning which provides easy access and information based resources [22]. The development and implementation of information and communication technology (ICT) forces today's universities and colleges to respond to societal trends that point to a transformation of our society into a so-called knowledge economy. ICT applications place new demands on higher education, especially in light of the growing importance placed upon lifelong learning and upon more flexible forms of higher education delivery [17]. ICT also helps administrators to save money, time and effort when dealing with issues related to higher education as Zainally (2008) pointed that "information and communication technology provides several facilities and possibilities for educational administrators to do their tasks"[26]. Integrating information and communication technologies, specifically computers, networks, and the Internet into higher education has created new opportunities for teaching, learning, and administration. The diffusion of information and communication technology into higher education can be attributed to its potential to leverage education processes toward richer and more rewarding learning and

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management environments [9]. For the past twenty years, the use of ICT has fundamentally changed the practices and procedures of nearly all forms of activities within business and governance. Within educational institutions, ICT has begun to have presence but the impact has not been as extensive as in other fields [1].

### **ICT in Higher Education**

Throughout the 1990s a combination of factors combined to force institutions of higher education to explore the unfolding opportunities that information and communication technology (ICT) offered in terms of both enhancing pedagogy while at the same time changing the manner in which administrators and academics engaged with multiple student cohorts [2]. As we move into the 21st century, many factors are bringing strong forces to adopt ICTs in education and contemporary trends suggest we will soon see large scale changes in the way education is planned and delivered using ICT [13]. Moreover, the rapid rate at which new technologies change and develop implies that higher education systems must keep pace with advancements in knowledge and skills. It is crucial that universities equip their students with the appropriate knowledge, skills and aptitudes to be competitive in an increasingly global and competitive economy [4]. "The ICT policy in higher education aims at preparing youth to participate creatively in the establishment, sustenance and growth of a knowledge society leading to all round socioeconomic development of the nation and global competitiveness"[22]. ICT is used not only for the delivery of lectures and materials, but also for administration and management purposes. It is clear that administrative functions such as student registration, grades, course schedules and even staffing evaluation, have benefited from the use of ICT [20]. Integration of ICT in higher education is inevitable and the thrust will be on the use of ICT to strengthen the system in the mode of opens and distance learning. Institutional and sector-wide higher education ICT policy and planning should identify the specific role of ICT in enhancing research capabilities and provide for adequate infrastructure backed by capacity building. Digital libraries, access to online databases, networking etc .can be enhanced through inter institutional collaboration to ensure optimal usage of ICT expertise and resources[22].

ICT can play significant roles in higher education, such as:

- Increasing access of university community to processes of making policy/rules procedures to existing policy/rules/procedures.
- Interaction between University management/administration with internal and external stakeholders
- Increasing transparency and accountability in budgetary and financial management, revenue mobilization and expenditure.
- Monitoring performance of teaching/research and various projects.
- Simplification of various University processes [10].

ICT enhances day-to-day management of institutions and the various functional areas in which it could be used are specified below:

- Timetabling;
- Student admission and Tracking;
- Financial Management;
- Medical services;
- Procurement and Store management; and
- Data distribution and management [7].

While incorporating ICT into the institutions such as universities, is more technical in nature, management, administration and support personnel must also understand and support all decisions made. At the same time, some academic staff may not welcome disruptions to their routines and methods of teaching, and may even see ICT as a threat to their careers. Organizing orientation and training programs will help to alleviate some of the anxieties and misunderstanding, and build the capacity of existing staff to carry out new responsibilities and tasks[20]. Higher education institutions are using ICT to develop course materials, deliver and share course content, lectures and presentations, facilitate communication among lecturers and students, encourage pedagogical innovation, increase cooperation and collaboration, conduct research, enhance professional development, and provide administrative and management services [4]. Shaikh & Khoja's study (2013) measures expert opinion of Pakistani higher education system (HES) experts on what role Information and communication technologies (ICTs) can play in shaping the future of Pakistani HES. Suggestions are formulated in higher education (HE) policy & planning, and provision of essential technological infrastructure. The study questionnaire administered to 30 participants randomly selected from urban and rural areas of Pakistan. Results revealed significant gaps in ICT demand and supply, ICT use, ICT-based HE problems, reasons for delays in ICT integration, and gave suggestions for developing ICT-driven HES in Pakistan [18]. It is clear that ICT importance and use, in higher education, lies in these categories:

### **ICT, Teaching/Learning**

Teaching students at universities must avoid the traditional styles that students were familiar with at high school. Although ICT may be available at high schools, its use at higher education is completely different, because teaching at university level will use ICT in different ways to meet the objectives of mature students. Universities cannot assume that their students already possess the necessary intellectual skills for effective use of ICT. They need to ensure that their academic programs help students to develop the necessary approaches to using technologies and tools[6]. Peeraer's study (2010) showed that the use of ICT applications for teaching practice in higher education is limited, mostly replacing traditional teaching practice. The factors explaining the integration of ICT in teaching practice are ICT skills and computer confidence [15]. "Technology has the capacity to promote and encourage the transformation of education from a very teacher directed enterprise to one which supports more student-centered models. Evidence of this today is manifested in:- The proliferation of capability, competency and outcomes focused curricula;- Moves towards problem-based learning; and- Increased use of the Web as an information source, Internet users are able to choose the experts from whom they will learn"[13]. While ICT improves learning experiences from any pedagogical perspective. ICT enables the effective storing/sorting of information, and can offer new fast ways of communication; It enables the reduction of information quantity towards a higher quality and better structure; It can be integrated into teaching and learning strategies and used to support relative learning theories; and ICT can be used to create new types of interactive learning media for improved quality, equity, and access in higher education [8]. ICT provides a technology that has the capacity to promote and encourage the transformation of education from a teacher directed enterprise towards student-centered models. As more and more students use computers as information sources and cognitive tools, the influence of the technology will increase to support their studies [12].

### **ICT, Administrative Services**

Administration is the heart of work at universities. When universities have developed and flexible administration, all other fields will go smoothly. Krishnaveni & Meenakumari's study(2010) showed that ICT has become a necessary tool for accomplishing the administrative tasks with ease and it is evident that

transformation in accordance with technological advancements is happening in the education sector. It is mainly used in the areas of student administration and staff administration [7].

### **Benefits and Implications of applying ICT in Higher Education**

ICT application in higher education can serve the following:

- a) Speed and automatic functions: the feature of ICT which enables routine tasks to be completed and repeated quickly, enabling teachers to demonstrate, explore or explain aspects of their subject, and allowing students to concentrate on thinking and on tasks such as analyzing and looking for patterns within data, asking questions and looking for answers, and explaining and presenting results.
- b) Capacity and range: the ability of ICT to access and to handle large amounts of information; change timescales, or remove barriers of distance; give teachers and pupils access to historical, recent and immediate information and control over situations which would normally be outside their everyday experience.
- c) Provisionality: the feature of ICT which allows information to be changed easily and enables alternatives to be explored readily.
- d) Interactivity: the function of ICT which enables rapid and dynamic feedback and response [5].

Furthermore, applying ICT in education has the following advantages:

- A sense of presence, possibly even community, in online interaction;
- Improved learner support;
- Unlimited practice of difficult concepts, skills, etc.;
- Unlimited access to resources via the Internet;
- Improved delivery of learner preferences;
- Global access to resources and teaching; and
- Learning anywhere, anytime [21].

There are some implications of ICT in higher education:

- Time, space and socio-economic factors are no longer major barriers to learning.
- Decentralized nature of the new technology frees the learner from the technology provider.
- Learners have access to variety of learning resources.
- Up-to-date knowledge from any part of the world.
- New media allows interactive, learner need not be a passive recipient of knowledge.
- New technology allows the learner to receive information in a variety of formats [11].

### **Challenges of applying ICT in Higher Education**

Some issues and challenges have emerged that should be considered by institutions when designing and implementing their own ICT for higher education plans, such as:

- Lack of support from management;
- Unclear division of function and power;
- Uncoordinated planning and implementation;
- Question of ownership;
- Shortage of trained staff to cope with the diversity of responsibilities and tasks;
- Resistance from staff and reluctance to be retrained; and
- Insufficient funds for developing, purchasing and implementing ICT [20].
- Overcoming negative perceptions from early unsatisfactory experiences.
- Educational design and publishing standards.

- Timescale and workload.
- Getting take-up of the quality assurance processes.
- Maintaining momentum [3].

Furthermore, Sinha (2008) mentioned some of the various administrative challenges for applying ICT in higher education as below:

- Global and local challenges;
- Universal and individual challenges;
- Balancing between traditional and modern approaches;
- Long term and short term considerations;
- Competition and equity challenges, and
- Extraordinary expansion of knowledge [19].

### **ICT, Research services**

Research is the main objective of learning in higher education. ICT provides researchers with different tools that help them in conducting their research papers. Also, ICT offer the chances for research publication, and for sharing research results with the research centers all over the world. In present scenario, ICT is well-designed to help researchers in almost all of the leading universities. Databases, digital libraries, etc. are available in most of the leading universities, too. In fact, the emerging universities suffer from a lack of technical services, whether in research or in the field of scientific publishing, and this in turn leads to the weakness of the output of those universities.

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