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ICT Transforming Teaching & Learning System

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Abstract

ICT is a wide-ranging term which consists of all communication devices and applications, comprising: televisions, radios, computers, cellular phones and satellite systems, network hardware and software and etc., as well as the various applications and services allied with them, such as the Internet, broadcasting technologies, E-Learning systems, videoconferencing, virtual classes, E-meetings, E-collaborations and distance learning. During the past few years, the India has witnessed a phenomenal growth in communication technology, computer network and information technology. Improvement of new broadband communication services and convergence of telecommunication with computers have created numerous possibilities to use a variety of new technologies and tools for teaching and learning system. The integration of computers and communications offers unprecedented opportunities to the Higher Education Systems with its capacity to integrate enhance and interact with each other over a wide geographic distance in a meaningful way to achieve the learning objectives. ICT can be used as acre or a complementary means to the teacher training process.

Keywords: E-Learning, Higher Education Systems, ICT, ICT Tools & Technologies, Teaching & Learning System.

1. Introduction

ICT has become an imperative driver of daily life and economic movement. An irresistible majority of people today use a computer for a variety of works; for the newer generation particularly, using a computer is a normal, daily activity. The integration of computers into the sphere of Higher Education reflects these propensities. The positive use of computers in Higher Educational contexts is reliant on not only on their obtain ability but also on users' familiarity with them. This also holds correct for access to the Internet. The pointers of the report paint an image of a population – and especially a youth population – fully embedded in a multimedia world. ICT technologies are vital in helping teachers provide innovative teaching and learning openings but they also play a noteworthy role in delivering effective College management. The European Commission even stated in a recent report that 'embedding ICT in Higher Education and training systems

requires further changes across the technological, organizational, teaching and learning environments of classrooms, workplaces, and informal learning settings' (European Commission, 2010, [3]).

2. ICT for Learning

- Higher Education authorities use an extensive variety of pointers to measure the obtain ability of ICT hardware and software in Colleges. Episodic reporting by institutions is the most mutual method for collecting information on the obtain ability of ICT equipment.
- ICT is extensively promoted by central authorities as a tool for teaching and learning but huge implementation gap remains.
- The updating of computer equipment and the procurement of Higher Educational software is a duty delegated to Colleges.
- Integrated information systems for observing student progression, managing human resource/teacher information as well as financial management have been established as part of the modernization procedure for college administration.
- The lack of ICT resources still affects the instruction of around one third of students. In mathematics and science, the lack of computer software was considered to be a better problem than the lack of computer hardware.

The use of ICT by teachers can have numerous benefits, which may even be increased if students themselves are enabled to use ICT in the learning process. Research has revealed that using ICT can increase students' motivation to learn through giving the learner more control over the learning experience. Students' uses of ICT can also enable personalized and individualized learning. Furthermore if ICT is used to support subject-specific learning, it can also have a constructive impact on attainment.

- Teachers are encouraged through central-level commendations, suggestions or support material to use a diversity of ICT hardware and software in the classroom, and in almost all countries this applies to each core curriculum subjects.
- An important consideration is the place of ICT equipment in Colleges. In several countries, computers are still not freely accessible to students in the classroom, but are located in computer labs where they can simply be used under a teacher's supervision and during specific hours.
- Teachers usually obtain ICT teaching skills through their initial Higher Education but further professional improvement is less common.
- Teaching staff are the important players in strengthening and fostering the new digital environment in colleges.

- However, although a positive drift can be observed in teachers' use of computers in class, their general motivation to use ICT leftovers an issue (Korte and Hüsing, 2007, [4]).Higher Education Systems need to adapt to help overcome this situation. As technology is continually changing, teachers need regular support to keep up-to-date through relevant professional improvement programs and resources.
- Digital literacy is taught mainly by expert ICT teachers but in approximately 50 % of countries it is also taught by other expert teachers such as mathematics or science teachers.
- Although ICT is comprised in regulations on teacher education, practical ICT-related pedagogical skills are seldom addressed at central level.
- Teachers' participation rates in proficient improvement on integrating ICT into the teaching process are higher for mathematics than for science.
- In almost all countries, centrally encouraged online resources exist to support teachers' use of ICT to deliver innovative teaching and learning prospects in the classroom. Moreover, pedagogical support is generally not available to help teachers with the practical implementation of ICT in the classroom.

According to Daniels (2002, [2]) ICTs have become within a very little time, one of the basic building blocks of modern society. Many countries now favor understanding ICT and mastering the basic skills and concepts of ICT as share of the core of Higher Education, alongside reading, writing and numeracy. However, it appears to be a misconception that ICTs generally refers to 'computers and computing related activities'. This is fortunately not the case, although computers and their application play a substantial role in modern information management, other technologies and/or systems also comprise of the phenomenon that is commonly regarded as ICTs. Pelgrum and Law (2003, [12]) state that near the conclusion of the 1980s, the term 'computers' was replaced by 'IT' (information technology) signifying a shift of focus from computing technology to the capability to store and retrieve information. This was followed by the introduction of the term 'ICT' (information and communication technology) about 1992, when e-mail started to become available to the general public (Pelgrum, Law, 2003, [12]). According to a United Nations report- 1999 ICTs cover Internet service provision, telecommunications equipment and services, information technology equipment and services, media and broadcasting, libraries and documentation centres, commercial information providers, network-based information services, and other related information and communication activities. According to UNESCO (2002, [10]) information and communication technology (ICT) may be regarded as the combination of 'Informatics technology' with other related technology, precisely communication technology. The various kinds of ICT merchandises available and having relevance to Higher Education, such as teleconferencing, email, audio conferencing, television lessons, radio broadcasts, interactive radio counseling, interactive voice response system, audiocassettes and CD ROMs

etc. have been used in Higher Education for diverse purposes (Sharma, 2003, [9]; Sanyal, 2001, [8]; Bhattacharya and Sharma, 2007, [1]).

During the past some years, the world has witnessed a remarkable growth in communication technology, computer network and information technology. Expansion of new broadband communication services and convergence of telecommunication with computers have created plentiful possibilities to use a diversity of new technology tools for teaching and learning system. The integration of computers and communications provides unprecedented opportunities to the Higher Education systems with its capacity to integrate enhance and interact with each other over a wide geographic distance in a meaningful way to achieve the learning objectives. The growth of these communication and computer systems, their ease of use, the authority and diversity of information transfer allow teachers and students to have access to a world beyond the classroom (Majumdar, 1997, [5]). It has the latent to transform the nature and process of the learning environment and envisage a new learning culture. Interactivity, flexibility and convenience have turn into the order of the day in the ICT supported environment. ICT opens up opportunities for learning since it enables learners to access, extend, transform and share ideas and information in multi-modal communication methods and format. It helps the learner to share learning resources and spaces, promote learner centered and collaborative learning principles and improve critical thinking, creative thinking and problem solving skills.

Not only mastering ICT skills, but also utilizing ICT to improve teaching and learning is of utmost significance for teachers in performing their role of creators of pedagogical environments. While literature provides a few evidence of the effectiveness of using ICT in technical considerations, little is recognized about which learning strategies and pedagogical framework should be used for Higher Education and training. How to build these electronic teaching and learning environments so that they are based on precise epistemologies or knowledge bases? What will be the innovative vision and guiding principles of teacher improvement for pedagogy-technology integration? As we become increasingly supported by ICT, teaching and learning will not be the same as before. We will have to make use of the affluent and exciting opportunities offered by the innovative technologies in Higher Education to reach our new goal and vision. To value the integration of ICT in teaching and learning, we need to understand the chief paradigm shifts in Higher Education in recent years.

3. Transformation in Teaching & Learning System

Higher Education around the world is experiencing major paradigm shifts in Higher Educational practices of teaching and learning under the umbrella of ICT enabled learning environment. Whereas learning through facts, drill and practices, rules and measures was more adaptive in earlier days, learning through projects and troubles, inquiry and design, discovery and invention, creativity and diversity, action and reflection is perhaps extra fitting for the present times. The major hallmark of this learning shift is from teacher centered

to learner focus paradigm. During the last three decades, the modifications in Higher Educational environment have been phenomenal. The model, focus, function of the learner and technology has been changed drastically from conventional instruction to virtual learning environment as depicted below.

Transformation in Teaching-Learning Environment:

Model	Focus	Learner	Technology
Conventional	Teachers	Inactive	Chalk & Talk
Information	Students	Active	Personal Computer
Knowledge	Group	Adaptive	PC+ Network

Shifting the stress from teaching to learning can create anextra interactive and engaging learning environment for teachers and students. This new environment as well involves a transform in roles of both teachers and students. The role of the teachers will change from knowledge transmitter to that of facilitator, knowledge navigator and sometime as co-learner. The new role of teachers demands a fresh way of thinking and understanding of the innovative vision of learning process. Students will have more responsibilities of their own learning as they seek out, find, synthesize, and share their knowledge with others (Resta, 2002, [7]) ICT provides powerful tools to support the shift from teacher oriented to learner oriented paradigm and new roles of teacher, student, curricula and new media. The major moves have been described in a tabular form below.

Transformation in Teachers' Roles :

Conventional	ICT Supported
Source of Knowledge	Guide & Facilitator of Knowledge
Organizer of Learning	Creator of Learning Environment
Forever Expert	Traitor& Co-learner
Learning to use ICT	Using ICT to Enhance Learning
Deductive/ Expository	Interactive/Experiential/Exploratory

Transformation in Learners' Roles :

Conventional	ICT Supported
Inactive Learner	Active Learner
Reproducer of Knowledge	Producer of Knowledge
Reliant Learner	Self-directed Learner
Introverted Learner	Shared Learner

Solely Learning Content	Knowledge to Learn/Think/Create & Communicate

Transformation in Curricula & Delivery :

Conventional	ICT Supported
Learning Facts	Inquiry Based
Reproduction Teaching Exercises	Authentic Learning
Rigid Delivery	Open & Flexible Delivery
(Fixed Time & Space)	(Any Time & Anywhere)
Single Path Progression	Multi Path Progression

Transformation in Media Applications :

Conventional	ICT Supported
Single Sense Stimulation	Multi-Sensory Stimulation
Single Media Application	Multimedia Application
Deliverance of Information	Exchange of Information
Monologue Communication	Dialogue & Collaborative
Non digital Resources	Digital Resources

All these changes are taking place in learning and teaching, which demand a new learning environment to effectively connect the power of ICT to improve learning. ICT has the potential to change the nature of Higher Education: where, when, how and the way learning takes place. It will facilitate the emergence of responsible knowledge society emphasizing lifelong learning with meaningful and enjoyable learning experiences.

4. Building New Cultures

The integration of ICT into the very idea of teaching and learning always places pedagogy over technology. It is not the only concern to master ICT skills, but rather it involves using ICT to improve teaching and learning. The main emphasis of ICT infusion in pedagogy should be such that it tends to improve learning, motivate and engage learners, promote collaboration, promote enquiry and exploration, and create a new learner oriented learning culture. It allows the move from reproductive model of teaching and learning to an independent, autonomous learning model that promotes initiation, creativity and critical thinking with sovereign research. Learners are expected to collect, select, examine, organize, extend, transform and current knowledge using ICT in authentic and active learning paradigm. Teachers are anticipated to create a

new flexible and open learning environment with interactive, experiential and multimedia based delivery system. ICT should help teachers and learners to converse and collaborate without boundaries, make learners autonomous and allow teachers to bring the entire world into classroom activities. It is ultimately important to understand the roles of ICT in promoting Higher Educational changes. An essential principle is that the use of ICT changes the distribution and ownership of information resources in the space of teaching and learning and thus changes the association among Higher Educational participants (Zhu, 2003, [11]).While designing any innovative teaching and learning environment using ICT, the teacher should for all time keep the learning at the center of all activities, pedagogy should be in the mind and integration of pedagogy-technology should be the central focus. The link between distance learning and telecommunications is becoming even stronger, yielding new solutions to old troubles, innovative Higher Educational resources and new teaching/learning practices. One of the most innovative and promising outcomes of this relationship is E-Learning and online Higher Education, particularly a process whereby teachers and students are linked up in an electronic media/computer network (Majumdar, S., and Park, M., 2002, [6]).

The concept of e learning and how it relates to efficient use of ICT is critically important for teacher education, because it places the focus firmly anywhere it should be - jointly on pedagogy and the new ICT. The term E-Learning, or learning via electronic media, nicely combines this double concept: first, the changing focus of pedagogy to learning and, second, the new technologies stretching further than the walls of the conventional classroom. In other words, E-Learning for teacher improvement is learning about, with, and through all electronic media transversely the curriculum to support student learning. ICT is the means, and E-Learning and the effective integration of pedagogy and ICT comprise the goal. There are a various benefits to E-Learning. These include any time learning, anywhere learning, asynchronous interaction and group collaboration.

5. Conclusion

As we become more and more supported by ICT, teaching and learning will not be the same as before. We will have to make use of the rich and thrilling opportunities offered by the new technologies in Higher Education to reach our training goal and mission. One of the objectives of the present paper is to provide better accepting and appreciation of the role of ICT in teaching and learning system. Several viewpoints of integrating ICT in teaching and learning system have been discussed. Learning is not a transfer of knowledge, rather an active construction. This paradigm shifts give the students an entirely new role that was not earlier described in the transmission model of teaching. Technology and teacher professional progress in its use are best introduced in the context of broader Higher Educational reorganization which embraces a shift away from teacher-oriented, lecture oriented towards Student oriented, interactive and

constructive learning environment. Multimedia and ICT can play the role of channel for such Higher Educational reforms. Multimedia courseware can promote effective instruction that is more engaging; learner oriented, interdisciplinary and more directly related to real life events and processes and adaptive to individual learning styles and needs. It also encourages higher order thinking skills and help to construct knowledge socially. Thus teacher professional improvement in the use of interactive technology should embody and model the forms of pedagogy that teacher can use themselves in their classroom.

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