Information and Communication Technology towards Development in Higher Education: A Review

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Abstract: It is said that "knowledge is power". In the case of our nation which was once known for its grand status of "Vishwa Guru" is again ready to emerge as knowledge super power in the world by transforming our population into knowledge enabled working population. The gradual process of human socialization takes place by the affection of parents and interaction with society. In this process, education plays a very vital role and transforms a biological man who is guided by instincts into a sociological man who is known for his thoughts and culture. With the modernization of our society, when every nook and corner is being guided by Information and Communication Technology (ICT), then "Education" which is known as the biggest socializing and modernization guiding factor cannot remain untouched with the blessings of this technology.

This study is designed to serve as comprehensive report on role and impact of Information Technology in boosting higher education. This popular technology give the advantage to education sector and role of information technology has resulted in a widening of educational access, giving people the chance to study for a qualification or a new career in their extra time. In this context, the study aims to give particular attention about how information technology plays a vital role in the education sector of India, to suggest some helpful measures to promote the involvement of information technology in education sector, to highlight the ways people use Information Technology for increasing their education, to understand the ways people use to uplift their ideas for research. The Higher Education Commission also facilitated the development of higher educational system in the country with main purpose of upgrading the universities and colleges in the country to be focal point of the high learning of education, research, and development through Information Technology.

Keywords: Information Technology, Higher Education, ICT initiatives

INTRODUCTION

Information technology is the use of computer and software to manage information. Young minds enable themselves to absolve surroundings information for informed decision making at any later stage in life and their they are enlightened to accept new ideas expose creativity , and develop critical thinking.

Computer is not very valid for us because we cannot afford it due to our underdevelopment stage. Gradually with the common use of computer and availability of desktop and lap tops and usability, low cost of computer increase the importance of computer. In urban areas at primary school level Information Technology is introduced and IT become compulsory for students.

In education sector information technology increasingly played a vital role since 1990. This popular technology give the advantage to education sector and role of information technology has resulted in a widening of educational access, giving people the chance to study for a qualification or a new career in their extra time. Information technology, or IT, has played a major role in extending the reach of the education sector. More people can now access career training and even degree courses online. Anyone who has a computer and the will to learn can study for a degree and/or a career change.We used outdated ways of technology and now starts technological advancement. Technology is to cater to this audience, one need to talk to them in their own language. The information society challenges the education system.

In recent years, both nationwide and globally the speedy, effective and global communication of knowledge has created a new foundation for co-operation and teamwork by information technology. The increasing role played by information technology in the development of society calls for an active reaction to the challenges of the information society. Ahead of now, the core qualification as well as to their understanding and knowledge of work and organization company is depending on information technology. Without information technology, Companies are no longer forced to gather all their functions in one place. Information technology make the society solid and broad education foundation on which to build because of becoming increasingly depended on information and processing. Currently the education sector has begun implementing a number of cloud computing projects not only for schools, but also to business, government, and the open source community to provide high-performance computing resources and services.

ROLE OF INFORMATION TECHNOLOGY IN HIGHER EDUCATION

Introduction of ICTs in the higher education has profound implications for the whole education process ranging from investment to use of technologies in dealing with key issues of access, equity, management, efficiency, pedagogy, quality, research and innovation. ICT applications provide institutions with a competitive edge by offering enhanced services to students and faculty, driving greater efficiencies and creating enriched learning experiences.

1. ICT in Teaching and Learning

While for higher education sector is planned to build a knowledge repository of multidisciplinary subjects, as a strategy to

counter the shortage of faculty in higher education, EDUSAT will be used to share the available expertise through modular programmes. This will be done by networking institutions, creation of virtual laboratories, creation of database, access to expert lectures and technological developments in industries and research organizations etc. Teaching and learning can further be improved by replacing of conventional teaching instead of the usual age old method of chalk and talk for teaching by innovative methods like power point presentations and animations, modeling and simulations, video clips and using AV aids, LCD projectors etc. This enhances the learning ability of the student and also helps the teacher to elaborate the difficult concepts effectively within a short time span.

2. ICT in Administration

ICT in administration of educational institutions play a major role in efficient utilization of existing resources and simplifies the administration tasks (e.g. in student administration, staff

administration, general administration etc.) by reducing the paper work and replaces the manual maintenance of record keeping to electronic maintenance of records which helps in easy retrieval

of any information of students, staff and general with in a fraction of seconds can access the required information.

3. ICT in Research

Integration of ICT in higher education enhances the quality of research work and more number of individuals enrolled in the research work in various fields. ICT facilitates the links across the world in all subject matter and made social networking. It saves time, money and effort to the researchers in their research studies.

4. ICT as a Change Agent in Higher Education

The evolution of higher education in India combined with the need to sustain and be competitive in a global scenario requires decisions to be taken quickly and effectively. This has enhanced the scope and complexity of administration, thus making it necessary to adopt different methods of higher education administration

Types of ICT devices in the classroom: Now a day, many devices are being used to impart quality education at all the levels. Some of them are appended below:

1.   Use of computers: Computers and related gadgets such as iPad or tablets are being used by teachers to assign work to students and for illustrating visual related subjects for making the lesson very easy and accessible for students. In addition, the use of internet explorer by students and teachers has broadened their learning capacity and awareness.

2.   Class websites and blogs creation:

The word Press and other content management software are used by teachers to create class blogs to post assignments. If the school has no website sever to host these class blogs, the teacher

can use free website hosting services like wordpress.com or blogger.com. Via these platforms, the teacher will create a blog under a sub domain of that host. For example, matchclass. wordpress.com, so students will find all academic assignments via that blog. It is very easy to manage and post data to a blog, because they have simple HTML editors.

3. Utilization of digital microphones:

Often the big classrooms suffer from endless noise, so in order to sort out this problem teachers have started using wireless digital microphones. These are very affordable devices and can transmit the voice to the loud speakers to enable every student to hear clearly. The same device can be used for asking questions by students and there is no need to strain the voice by teachers.

4. Use of smart phones and mobile learning:

Use of smart phones by students and teachers has enabled the facility of mobile learning which is very much similar to e-learning or long distance education. M-Learning is very convenient and accessible as students can access academic information like assignments via an educational mobile application (APP). The biggest advantage of this facility is that it can be done in the classroom or outside the classroom.

5. Smart Interactive whiteboards:

Teachers are now using smart interactive white boards having touch screen function. With this the teacher displays visual images by using projector. They get operated by commercial power supply and can be proved very beneficial in saving time.

6. Effective utilization of online media:

The modernization of electronic media has enabled the teachers and students to use online streaming media in the classroom and with the help of projector, computer, internet and a white board. They are displaying a real time example using sites like Youtube.com. It can be used for academic reference.

Major ICT initiatives in Higher Education

Various initiatives in the recent past portrayed the significant role that ICT plays in the realm of higher education development. Several projects have reduced the costs, and it also has increased transparency. India has taken up major initiatives in terms of content delivery and furthering education through Information and Communication technology. For example Gyan Darshan was launched in 2000 in broadcast educational programs for school kids, university students and adults. Similarly Gyan Vani was another such important step with broadscast programs contributed by institution such as IGNOU and IITs .Under the UGC country wise classroom intiative, education programs are broadcast on Gyan Darshan and Doordarshan national channel every day. E-Gyankosh which aims at preserving digital learning resources is a knowledge repository

launched by IGNOU in 2005.Almost 95% of IGNOU's printed material has been digitized by uploaded on the repository. The national programme for technology enhanced learning (NPTEL) launched in 2001 is another joint initiative of IITS and IISC which education through technology. Sristi, the society for research and initiatives for sustainable technologies and institutions is facilitating the use of ICT for strengthening the capacity of grass roots inventors, innovations and entrepreneurs engaged in conserving bio diversity and developing eco-friendly solutions to local problems.

Benefits of ICT in Higher Education

Use of ICT in education presents a unique opportunity to solve multitude of challenges quickly as well as at low rate. Here is an overview of advantages of an ICT:-

1. Motivating Factor:-

The internet can act as a motivating tool for many students. Young people are very captivated with technology. Educators must capitalize on this interest excitement and enthusiasm about the Internet for the purpose enhancing learning. For already enthusiastic learners, the internet provides them with additional learning activities not readily available in the classroom.

2. Fast communication:-

The internet promotes fast communication across geographical barriers. Students can join collaborative projects that involve students from different states, countries or continents.

3 co-operative learning:-

The internet facilitates co-operative learning, encourages dialogue and creates a more engaging classroom. For example, a LISTER V for our class will allow students to get involved in class discussions through e-mails in a way not possible within four walls of classroom.

4. Locating Research materials:-

Apart from communication, research is what takes many people to the internet. There are many resources on the internet than the school library can provide.

5. Acquiring varied writing skills:-

If students are required to publish their work on the internet, they have to develop hypertext skills. These skills help students gain experience in non sequential writings.

Challenging Factors Affecting Utilization of ICT in Higher Education: In our country, ICT has played a very crucial role in the betterment of higher education. But it is also a burning issue in today's era that ICT is suffering from many challenges and problems. Many literary issues are continuously projecting that ICT can play much bigger role in improving India's higher education by providing greater equity, better access and improved quality. In the year 2008, a survey was conducted by UGC on accredited colleges and it was found that percolation and penetration power of ICT in higher education is far from satisfactory due to poor infrastructure and many things can be done to improve the situation. Majority

of our population residing in the rural areas have poor access to internet, so it is very much essential to improve their exposure and training on basic computing skills in order to reap the real benefit of ICT. According to the International Telecommunication Union; The Internet and Mobile Association of India (IAMAI) report a majority of government institutions do not have sufficient IT systems. As our nation is blessed with multilingual culture, so the development of content in many languages will surely enhance the ICT applications. According to the 2011 Census the rural-urban distribution is 68.84% & 31.16% in terms of population where majority of the rural people do not speak English. Therefore, the need to develop content in all the official languages of India becomes all the more important. While there are many challenges in development of local language content particularly due to the absence of script and font standardization, local language computing becomes problemetic though not impossible. However, this needs to be addressed immediately. The main problem which the current scenario is facing is high cost of acquiring and installing, operating and maintaining ICTs. While potentially of great importance, the integration of ICTs into teaching is still in its infancy. Introducing ICT systems for teaching in developing countries has a particularly high opportunity cost because installing them is usually more expensive in absolute terms than in industrialized countries whereas, in contrast, alternative investments (e.g. buildings) are relatively less costly.

PROBLEMS OF ICT IMPLEMENTATION IN HIGHER EDUCATION.

1. ICT Supported Infrastructure and Lack of Resources

The effective use of ICT would require the availability of equipments which are not available in all the educational institutions. Besides, ICT requires up-to-date hardware and software. High-speed internet connection is another prerequisite for integrating ICT into the teaching-learning situation. But unfortunately internet access is very poor.

2. Insufficient Funds

Effective implementation of technology into education systems involves substantial funding. ICT-supported hardware, software, internet, audio visual aids, teaching aids and other accessories demand huge funds. Afshari, Bakar & Su-Luan et al. (2009) state that efficient and effective use of technology depends on the availability of hardware and software and the equity of access to resources by teachers, students an administrative staff. These costs are in most cases substantially high and cannot be provided by the stake holders.

3. Political Factors

Sharma (2003) states that the most notable of the barriers to the use of ICT in education in developing countries seems to be the political will of the people in the corridors of power. The allocation of

sufficient funds for the educational sector and ICT does not seem to be very attractive to the leaders. If the political leaders favour the technology, it will bloom. It is observed that the vision and mission of the government changes after change of power at the centre as they fix priority to some other sectors in the form of fund allocation and its policy implementation.

4. Social and Cultural Factors

Mc Donald (2001) has suggested that the emergence of English as a dominant language of science, technology, business and interactional relations, as well as education and training, would ensure the availability of globally useable knowledge products. This in turn will also offer more opportunities for a wide range of choices in educational and training courses. But currently language seems to be one of the major social barriers to the use of ICT, particularly, in rural areas. Wims and Lawler (2008) found that lack of developmentally-appropriate software (DAS) is one of the difficulties faced by teachers and students.

5. Corruption

Corruption is one of the strong barriers to the implementation of ICT in education. The misuse of government funds which could have been used to develop other sectors like the integration of ICT in education is channeled in other directions i.e. few people benefit from those funds by pocketing all the money (Kessy et al, 2006). The budget for the newer technology is misused due to corruption at every level in the administration. Huge budgets are passed to buy modern teaching and learning materials for the improvement of the teaching and learning process, but in the end only minor improvements are found in the overall technical and vocational sector. **6. Teachers' Attitudes and Beliefs about ICT**

Teachers' attitudes have been found to be major predictors of the use of new technologies in instructional settings (Almusalam, 2001). Mumtaz (2000) states that teacher' beliefs about teaching and learning with ICT are central to integration. To be successful in computer use and integration, teachers need ''to engage in conceptual change regarding their beliefs about the nature of learning, the role of the student, and their role as teacher'' (Niederhauser et al. 1999, p. 157). Therefore, if teachers want to successfully use technology in their classes, they need to possess positive attitudes to the use of technology. Such attitudes are developed when teachers are sufficiently comfortable with technology and are knowledgeable about its use (Afshari et al, 2009).

7. Lack of Knowledge and Skill
According to Pelgrum (2001), the success of educational innovations depends largely on the skills and knowledge of teachers. Teachers' lack of knowledge and skills is one of the main hindrances to the use of ICT in education both for the developed and underdeveloped countries (Mamun, & Tapan, 2009; Pelgrum, 2001). Integrating technology in the curriculum requires

knowledge of the subject area, an understanding of how students learn and a level of technical expertise (Morgan 1996). Moreover, Berner (2003) found that the faculty's belief in their computer competence was the greatest predictor of their use of computers in the classroom. Therefore, lack of knowledge regarding the use of ICT and lack of skill on ICT tools and software have also limited the use of ICT tools in teaching learning.

8. Lack of Time

Teachers are burdened with heavy workload. In these circumstances teachers don't have time to design, develop and incorporate technology into the teaching learning situation (Beggs, 2000; Ihmeideh, 2009). Research studies reported lack of time as one of the biggest constraints to the integration of ICT into the teaching learning. Teachers need time to learn how to use the hardware and software, time to plan, and time to collaborate with other teachers. They also need time to develop and incorporate technology into their curriculum. Some teachers are unable to make appropriate use of technology in their own classrooms, while others are unwilling to try because of anxiety, lack of interest, or lack of motivation (Duhaney 2001).

LITERATURE REVIEW

1. **Chandra Shekhar Singh, (2017):** The main idea behind this paper is to find out the role of ICT in education sector in our country with an assessment of its impact on students and teachers which has facilitated the growth of interactive learning in higher education with social effectiveness.

2. **Dr. Md. Mahmood Alam, (2016):** This study recommended that Effective implementation of ICT in education requires commitment from the stake holders, remove lacknes of resources results in ICT integration and suggested that the government should formulate policies for encouraging girls with respect to the adoption of ICT. Finally he concluded the Higher education institutions are important actors in the community and can be perceived as models for society in the pursuit of sustainable development.

3. **Hadiya Habib (2017):** The quality of programs as measured by fitness for purpose should continue to grow. He concluded ICT play vital role as a strong agent for change among many educational practices i,e conducting online exam, pay online fees, accessing online books and journals. Also he suggested that the funds must be provided to initiate, develop, promote, review and implement ICT policies in the educational sector to bring about an improvement on ICT utilization.

4. **J. Augustus Richard (2015):** This study highlighted on the adoption and uses of ICTs in education have a positive impact on teaching, learning, and research. ICT can affect the delivery of education and enable wider access to the same. In addition, it will

increase flexibility so that learners can access the education regardless of time and geographical barriers in the 21st century. The overall literature suggests that successful ICT integration in education in the 21st century.

OBJECTIVE OF THE STUDY

1. To determine the role being played by ICT in Higher education.

2. To determine the benefits of ICT in Higher education.

3. To determine the challenges being faced by ICT in higher education and their probable solutions.

SUGGESTIONS

In the light of the above discussion, the paper suggests the following recommendations for improving on the current situation:

1. Effective implementation of ICT in education requires commitment from the stake holders. That is, all the stakeholders and responsible authorities including teachers and other staff should be aware of the importance of technology in developing student's learning and should strive to overcome the barriers, so that students can benefit effectively from this ICT.

2. Lacks of resources results in lack of ICT integration, which in turn results in lack of sufficient computer experience for both pupils and teachers. The stakeholders and school authorities need to be provided with adequate facilities and resources for effective implementation of ICT. The government should formulate policies for encouraging girls with respect to the adoption of ICT.

3. Effective implementation of ICT in educational institutions requires in-depth professional development. Attention needs to be given to in-service, pre- service and newly appointed teachers to acquaint them with the role of technology in educational settings and to train them on how to prepare and use ICT competently.

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5. To introduce and implement computers in the classroom effectively, changing teachers' negative attitudes is essential. Therefore, if teachers want to successfully use technology in their classes, they need to possess a positive attitude to the use of technology.

CONCLUSION

Higher education institutions are important actors in the community and can be perceived as models for society in the pursuit of sustainable development.

Higher education should not only critically reflect on learning environments and learning processes for students, they should also reflect on their role in creating an infrastructure that supports and enhances lifelong learning processes. The wide adoption of ICT calls for mindsets and skill sets that are adaptive to change. ICT integration in higher education brings a change in student and teacher learning behavior and develops higher order skills such as collaborating across time and place and solving complex real world problems.

The quality of programs as measured by fitness for purpose should continue to grow, if the stakeholders perceive the various educational programs as meeting their needs and expectations. ICTs serve to provide the means for activities to realize the potential in human resources. Furthermore, adequate funds must be provided to initiate, develop, promote, review and implement ICT policies in the educational sector to bring about an improvement on ICT utilization higher education.

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