

## **Integration of ICT in Higher Education Institutions: Scope and Challenges**

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### **Abstract:**

*The use of ICT in higher educational institutions has become a buzzword today. The researchers all over the world have established a strong correlation between the use of educational technology and betterment in teaching learning process. But technology is still a restraint in HEIs due to various problems and challenges. The Indian educational system has witnessed enormous changes over the period of time from the prehistoric period to the modern days. From the earlier Gurukul school system to today's virtual learning system, the pedagogy, methodology, type of learners have underwent significant changes. Today, no HEIs and teachers can ignore the positive impact of integration of ICT in teaching-learning process, administration, assessment strategies and execution of content delivery. But application of ICT in rural HEIs poses some issues and challenges also. Lack of required infrastructure, reluctance of teachers in application, lack of funds for management of tools of technological advancement, pedagogical disbeliefs on the part of teachers and more issues create stumbling blocks in integration of ICT in educational system in HEIs. But in the world of globalization and privatization that demands skilled laborers and smart work, it has become imperative to embrace the technology for the sustenance of quality and establishment of quality culture. The proper adoption of ICT only can help the learners keep pace with the world of cut throat competition and face it positively.*

**Keywords:** *Information and communication technology, education, Higher Educational institutions, learning, teaching, quality culture.*

### **Introduction:**

Change is the law of nature. Today the world is changing rapidly in all walks of life. As per Darwin's 'theory of survival of fittest', only those can survive who undergo changes with the passage of time and it is equally applicable to individuals in general, educational systems, universities, teachers and learners etc. The time has witnessed a paradigm shift in pedagogy, content, and type of learners. Employment has become the biggest concern of learners in various fields today. The teachers cannot be content with conventional methodology for delivery of content and dissemination of information. Today technology has entered in almost every field for betterment, precision. It has also improved the work efficiency, and optimum output. When the entire world is adopting technology for better results, no one can remain aloof from it. The revised framework of NAAC has underlined the role of Information and communication technology in HEIs for creating quality culture. In

this scenario, no other alternative except its adoption and integration is the only way to keep pace with the world. This paper discusses the use of ICT in HEIS, its challenges.

### **Role of Technology in Education and its Impact**

It is beyond doubt that technology has far reaching positive impact on the entire process of education especially teaching and learning. Today in the world of globalization, privatization and cut throat competition, the conventional learners who are reluctant towards the application of technology in education, cannot keep pace with the world. Technology helps everyone in conceptualizing the execution and evaluation of the learners. It brings accuracy, improves ease of learning, and therefore can help in bringing out the optimum results. As far as educational technology is concerned, it has three domains of use: 1. Technology as a tutor 2. Technology as a teaching tool and 3. Technology as a learning tool (Stosic, *Importance of Educational Technology*). A research at the Centre for Educational Research in Pittsburgh within Individually Prescribed Instruction showed that computers are better tailored to the individual abilities of students, rather than teachers themselves. Educational technology must inevitably be integrated into classrooms and curricula (Clements and Sarama; Glaubke 2007 qtd. in Stosic, 112). With the invention of technology (radio and television as stated above), it's application was incorporated in teaching and learning. Now integration of advanced technological tools in teaching-learning process has also proved a big challenge for teachers teaching at various levels. In nutshell, with technology one can expect increased efficiency and effectiveness on both the part of teachers and students.

### **ICT: Meaning, Nature and Scope**

In the educational field, the acronym ICT has become a buzzword today. Since the revised framework of NAAC has emphasized the role of ICT in higher education institutions (HEIs), it has become obligatory for various institutions and thereby the faculties to incorporate and use it for sustenance of quality and establishing quality culture in the institutions. 'The Information and Communication Technology (ICT) is an umbrella term that includes any communication device or application, encompassing: radio, television, cellular phones, computer, and network hardware and software, satellite systems and so on, as well as the various services and applications associated with them, such as videoconferencing and distance learning' (Mondal & Mete, *ICT in Higher Education*). When we use the term ICT, it may have two interpretations. Firstly, it may mean information, communication and technology. But information technology and communication technology cannot stand independently. So overall it stands for technology. But this interpretation and meaning of the term ICT is lopsided and seems incomplete. Secondly, it may suggest information, communication and technology. Another way of looking at it is

1. Information- (or data) in paper or electronic format
2. Communication- in person or electronically (electronic communication), in writing or voice telecommunications and broadcasting
3. Information Technology (IT) – including software, hardware and electronics

4. Communication Technology – including protocols, software and hardware (Siva, Present Education System in India)

The impact of ICT on fields like tourism, law, banking engineering, medicine, architecture, research in the past few years has been enormous. Cross and Adam (2007) discusses four rationales for introducing ICT in education as follows:

**Table 1: Rationales for introduction of ICT in education**

Rationale	Basis
Social	Perceived role that technology now plays in society and the need for familiarizing students with technology
Vocational	Preparing students for jobs that require skills in technology
Catalytic	Utility of technology to improve performance and effectiveness in management and many other social activities
Pedagogical	To utilize technology in enhancing learning, flexibility and efficient curriculum delivery

(Source: Cross & Adam, 2007)

The ICT based tools has both positive and negative impact on the teaching learning process and on society. The potential of each technology varies according to how it is used. Haddad and Draxler identified five levels of technology use in education, such as presentation, demonstration, drill and practice, interaction, and collaboration (Haddad & Draxler qtd. in Ogbomo 1). But till today most of ICT users are using technology for only presentation and demonstration. On the other hand, use of LMS and the web facilities of ICTs enable interactive and collaborative learning.

There are various ways of use of ICT in education, such as Computer aided, Computer based, Internet based and Software based.

1. **Computer aided:** With the introduction of ICT in education, classroom learning is one attribute that makes learning experiential and experimental to students. Students can listen to the lecturer, receive visual cues through PowerPoint images, handouts or whiteboard lists and participate actively.
2. **Computer based:** It imparts computer knowledge in students and enables them to obtain large amounts of information stored in the system. It also helps the students to process data and use effectively.
3. **Internet based:** Internet tools like e-mail, social networks, newsgroups and video transmission have connected the world like never before. With the help of social networking sites and emails, the learners can interact and share information. Online learning and distance learning also function through internet. The students can learn online and can also talk to experts online. Notes, tutorials, assignments can be received by students from anywhere. The internet provides major information in texts, audios, videos and graphics which can be accessed by the individual.

4. **Software based:** it is the most advanced mode in ICT based teaching learning process. Various softwares are developed to deliver the information to the learners present in remote places. Here learners can receive information, they can experience the lecturer and co learners, and they can raise the questions and get answers in real time.

**Integration of ICT in higher education in positive perspective:**

The process of teaching has drastically changed from oral to virtual class rooms and learning is also modified greatly. Initially, memorisation was the only way of learning but now it is greatly modified to problem based and experiential learning modes. Now, memory does not mean knowledge. Now knowledge implies understanding, logic, reasoning and correlation. In this era of education, the technological tools play very important role in both teaching and learning processes. These technological tools give power to the teachers to deliver the information more effectively and help the learners more conveniently. It is useful for all the stakeholders of higher education. Incorporation of ICT yields following benefits to various stakeholders of higher education.

Stakeholder	Benefits
Students	<ul style="list-style-type: none"> <li>✓ Easy understanding of the concepts</li> <li>✓ Learning from expert resource faculties</li> <li>✓ Can store large amount of information virtually</li> <li>✓ No anxiety of missing class room lectures</li> <li>✓ No barrier of age limit</li> <li>✓ No need to spend money on expensive books</li> <li>✓ No need to travel to any institution</li> <li>✓ Learning at their convenient timings</li> <li>✓ Freedom of opting subject/ course</li> <li>✓ Low cost of education</li> </ul>
Teacher	<ul style="list-style-type: none"> <li>➤ Betterment in delivery of the content</li> <li>➤ Dissemination of knowledge to large number of students even remotely placed</li> <li>➤ Easy delivery of reading material/notes</li> <li>➤ Ease in assessment and evaluation of learners</li> <li>➤ Provision and evaluation of assignment becomes easy</li> <li>➤ Data maintenance and analysis with least complication</li> <li>➤ Can track the progress of each and every student.</li> </ul>
Administrators	<ul style="list-style-type: none"> <li>• No need to maintain huge physical infrastructure</li> <li>• Easy data maintenance</li> <li>• No need of huge library and other facilities</li> <li>• Easy monitoring of progression of curriculum taught</li> <li>• Feedback, analysis and follow up process becomes easy</li> </ul>

Universities	<ul style="list-style-type: none"> <li>✓ No need to maintain physical infrastructure</li> <li>✓ Ease of data maintenance</li> <li>✓ Saving of time, money and labour for conduct of examinations</li> <li>✓ Easy and fast result declaration and delivery of results</li> <li>✓ easy and confidential communication with stake holders</li> </ul>
Parents	<ul style="list-style-type: none"> <li>• Proper monitoring of wards attendance</li> <li>• Easy tracking of wards progress</li> <li>• Communication with teachers</li> </ul>
Government	<ul style="list-style-type: none"> <li>▪ Education to all</li> <li>▪ Access of education to remote area</li> <li>▪ Continuing education</li> <li>▪ Skill development</li> <li>▪ Equity in quality education to all</li> </ul>

With the integration of ICT in HEIs, the students seem to become the biggest beneficiaries. By using different technological tools during teaching learning process, their learning becomes easier, faster, more interesting, multidimensional and efficient. The ICT tools also enhance creativity and critical thinking learners and motivate them to explore complex dimensions of knowledge. It helps to sharpen and improve their skills which can lead to better employment.

When the **students** learn through ICT mode by audio visual method, they can grasp and retain the content better as brain processes visuals faster than the text. Students can replay or retrieve the missed lectures as per their convenience as lectures are stored on the server. Through online learning/education, students can minimize the cost of education since most of the courses are free of cost.

With the use of ICT the **teachers** enter in to another phase of pedagogy leaving aside their conventional approach of blackboard teaching. With ICT tools teachers can deliver the content more effectively with precision by using images, videos, graphs and animations. It makes the lecture highly interesting providing least scope of distraction and diversion on the part of learners. Assessment and evaluation of learners which is time taking and hectic activity of teachers, become easier and faster with the use of ICT. Moreover the provision of assignments and reading materials becomes easier. The teachers can communicate with and concentrate on every student personally, can track the learner's progress accurately. This entire process strengthens bonding between teacher and learner.

Establishment of enormous physical infrastructure is the biggest issue of the **administrators**. But, the use of ICT can minimize the cost of physical infrastructure and library facilities. The application of ICT makes the maintenance of data regarding admission, dues and

documentation easier. With the help of LMS administrator can monitor the progression of curriculum precise and clear thereby making the feedback, analysis and action taken easier.

Whenever we think of universities, it is assumed to have extensive campus with lot of physical facilities. But, in the present scenario some **universities** which function online only do not have any physical existence. The adoption and integration of technology in various works of universities automatically saves time, money and labor for activities like conduct of examination, declaration and delivery of results. With the use of proper software the communication with various stakeholders becomes safe and secure.

In conventional college setup, the **parents** are often dissociated from their wards institutions due to various factors like distant location of HEI from their locale, lack of time and hesitation in visiting the HEI in order to know the progress of their wards. With the advent of globalised technology, and its integration in HEI, the parents can easily monitor their wards progress as well as can communicate with the teachers as per the requirement.

With the use of technology the **government** can provide education to all sections of the society irrespective of the location, time and socio-economic status. Most of the learners who are branded as dropouts (due to various reasons) and the working class of people can continue their education through online resources. The skilled and technologically sound learners (especially youth) are assets of any country. They directly and indirectly help in the tackling the problem of unemployment and creating new platforms for the employment of others. It ultimately leads to growth and development of the nation.

### **Problems and challenges in integrating ICT in HEIs.**

Though application of ICT certainly gives positive impact, it poses lot of challenges also. If the HEIs are located in rural areas, the challenges and obstacles become more. The problems and challenges that various stakeholders face in the integration of ICT are discussed below:

1. **Costly affair:** For the creation of ICT enabled environment in HEIs, it requires a complete set up comprising installation and availability of instruments like computers, projector, smart board, scanner, television set etc. The purchase of all such devices in suitable numbers in proportion to the students is expensive and all HEIs cannot afford to do so. Along with these hardware, the cost of purchasing licensed software is also very high.
2. **Reliability:** Internet plays a very significant role in transmission of data in ICT worldwide. There are thousands of websites showing information of various online learning platforms, modules, courses. Even social media is also a type of ICT tool. But along with the genuine information providers, there are fake websites also purposed only to earn money and befool the visitors and users. So reliability of data/information is one of the genuine problems. The problem of making a right choice among the websites or information providers becomes a genuine issue.
3. **Privacy:** The computer systems that we use for dissemination of information always face a threat from hackers. These threats can become serious issues especially during

online examination conducted by universities where questions papers and confidential information is shared through internet. The website hackers can misuse the data thus stolen from systems.

4. **Over Stimulation:** It becomes a challenge for the beginners who adopt ICT tools for teaching learning or just for retrieval of information as a part of amusement for the first time. Since too much information comes rapidly, it poses a danger of user getting over stimulated. It can overwhelm user's thinking and cognitive capacities. Some beginners may become addicted for the application resulting into increase of stress level. The sudden deaths of many addicted PUB G game users witnessed in the past validate this fact.

#### 5. **Lack of Socio- Cultural Interaction**

The schools and colleges having an extensive physical infrastructure creates congenial environment conducive for learning and personality development. This environment provides scope for interaction with peers through which learner can develop many aspects/lacunae of his/her personality. The communication with peers provides multiple benefits to learners which he misses during online learning. It may bring feeling of isolation and alienation from the external world when the user uses online platforms of learning. The learners even miss the opportunity of learning other skills like sports, leadership, team work which he/she might have acquired otherwise. So overuse of ICT creates a feeling of alienation and loneliness.

#### 6. **Lack of Knowledge/Skills**

The use of ICT tools is not beginner friendly for teachers as well as learners. Moreover all teachers are not competent enough to use the tools with ease and precision. Some tools require skills and knowledge for their application. Secondly some users do not have willingness and show reluctance to learn new ideas and they feel boredom and lag behind in the process of progression.

#### 7. **Digital Divide**

The application of ICT and other technological advancement creates a gap between those having and not having access. It divides the users just like social divide or economical divide between 'the haves' and 'the have nots'

#### 8. **Data Protection**

Though computer systems can store huge data but protection of this stored data is a matter of concern. The users may face system crash in the event of which we may lose all data. The users may often face the problem of corruption of data due to viruses and bugs.

#### 9. **Incompetence of English language**

There are billions of web pages on various sites of internet and every day millions of new web pages are added. But majority of the information available on internet is in English language. Moreover, operational language of almost all ICT tools is English. The knowledge of English language gives access to smooth use and understanding of this information. The lesser the competence in English, the more the confusion in understanding the content. So having a good knowledge of English becomes a prerequisite for better results and output of using ICT tools and other technology.

10. **Political Will:** The establishment of ICT enabled infrastructure and maintenance of IT equipments is expensive. But more than that creation of technologically sound HEIs should be a policy of the government which is unfortunately not as positive as it is required. The governmental biased policy of considering education sector as unproductive often mars the HEIs growth and development. In India, share of allocated budget in GDP is comparatively far lesser than many countries that are smaller in size and less developed than ours. Hence political goodwill is essential to make the HEIs technologically sound to yield better results and make learners skillful and employable.

### Conclusion:

In the wake of continually changing technological advancement in the era of globalization, privatization and revised framework of NAAC, integration of ICT has become unavoidable feature for the teachers and HEIs. Despite having challenges and problems, adoption and integration ICT for betterment of teaching-learning process and creations of quality culture has become need of the hour. The focus needs to be shifted from challenges to the possible solutions. The use of legal and authentic softwares, proper training of teachers for operations of ICT enabled devices and tools, boosting of interest among the learners can mitigate the intensity of much of the problems faced during ICT application. Teachers and administrators being the biggest stakeholders of HEIs, it is imperative to use ICT for creating atmosphere conducive for learning. Constant up gradation of knowledge and acquisition of new skills are also necessary for making the learners employable. The responsibility of making our higher education system robust, dynamic and output oriented rests with all the stakeholders of HEIs especially teachers administrators and universities and government.

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