

# INFORMATION AND COMMUNICATION TECHNOLOGY (ICT): NEW APPROACHES IN HIGHER EDUCATION

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**ABSTRACT:**Information & Communication Technology (ICT) has become one of the basic building blocks of modern society. There is a wide spread belief that ICTs have an important role to play in changing and modernizing educational systems and ways of learning. ICT can provide more flexible and effective ways for professional development for teachers, improve pre- & in-service teacher training and connect teachers to the global teacher community. Teaching is becoming one of the most challenging professions in our society where knowledge is expanding rapidly and modern technologies are demanding teachers to learn how to use these technologies in their teaching. This topic mainly focuses on different areas such as educator's pedagogy influencing the effective use of computers for teaching purposes, Impact of training and experience in using ICT by in-service teachers, Impact of ICT diffusion, participatory development of teaching and learning, the effectiveness of using internet as a principal information resource in teaching and learning activity in higher educational institutions, teacher educators' ICT competencies, usage, and perceptions, Computer based technology and its pedagogical utility, ICT usage in Teacher Education, ICT adoption among secondary school teachers, ICT In initial teacher education, Teachers' incorporation of ICT in classroom teaching, Computer and Internet awareness in school going students, e-Training the future world of education, Utilization of computer technology in remedial instruction and modern ICT trends in teaching technology and other related areas.

**KEYWORDS:**Information & Communication Technology (ICT)

## INTRODUCTION:

*"ICT stand for information and communication technologies and is defined, as a diverse set of technological tools and resources used to communicate, and to create, disseminate, store, and manage information" .....* NCTE (2009)

Today's technologies are essential tools for teaching and learning. A variety of Information and Communication Technology (ICT) can facilitate not only delivery of instruction but also learning process itself. Moreover, ICT can promote international collaboration and networking in education and lifelong professional development for today's teacher. There's a range of ICT options – from videoconferencing through multimedia delivery to websites – which can be used to meet the challenges teachers face today. ICT can change the way teachers teach and that it is essential useful in supporting more student centered approaches to instruction and in developing the higher order skills and promoting collaborative activities. To use these tools effectively and efficiently, teachers need visions of the technologies' potential, opportunities to apply them, training and just-in-time support and time to experiment. Only then can teachers be informed and confident in their use of new technologies.

Teaching is becoming one of the most challenging professions in our society where knowledge is expanding rapidly and much of it is available to students as well as teachers at the same time. As new concepts of learning have evolved, teachers are expected to facilitate learning and make it meaningful to individuals learners rather than just to provide knowledge and skills. Modern developments of innovative technologies have provided new possibilities to teaching professions, but at the same time have placed more demands on teachers to learn how to use these new technologies in their teaching. These challenges ask teachers to continuously retain themselves and acquire new knowledge and skills while maintaining there their jobs.

ICTs give a new perspective on social and economic profile of the general people. The information access and the other digital services improve the educational standard. Many scholars have reflected many problems of taking about ICT, also they have stated that invention and diffusion are but means to an ultimate end, the consequences that result from adoption of an innovation. Change agents generally give little attention to consequences. They often assume that adoption of a given innovation will produce mainly beneficial results for adopters. This expression is one of the pro-innovation will produce mainly beneficial results for adopters. This expression is one of the pro-innovation biases. Change agents should recognize their responsibility for the consequences of innovations that they introduce. Ideally, they should be able to predict the advantages and dis-advantages of an innovation before introducing it to their clients. This is seldom done and often it cannot be done. So, it is imperative that the consequences (effects or influences or impacts) of these initiatives be studied from the audience's perspective.

These generations of learners are witnessing the changing scenario of education. 21st century is full of innovations and exploration in the education. Every aspect of educational system has been changed due to ICT and new technologies in Education. In previous education system teacher was the central figure of entire activities but now student is the central figure of this process. But due to emergence of Information and Communication Technology now learning opportunities knocks at the door of learner. Gradually ICT tools are taking the place of conventional tools i.e. black board, charts etc. Literary meaning of information is that which can be communicated and can be understand, Communication means exchanging the views and ideas and Technology means process of using scientific material and human resources in order to meet human need or purpose. So it can be infer that use of diverse set of technology in education is ICT.

However, this does not mean that the presence in a higher educational institution of modern means of ICT will lead to the growth of professional skills of teachers and quality of education. The involvement of teachers in the process of informatization of the educational space cannot catch up with the tightening of requirements for professional competence and skills of academic staff. In this context, it is impossible to ignore the so-called “internal,” or the psychological, aspect of the use of ICT by teachers in their educational activity. We should pay attention to the importance of values and motivation of the use of electronic educational resources by teachers.

#### REVIEW OF RELATED LITERATURE:

- **Niyaz Ahmad (2011):** In his paper “Effective Educational Management: An Implementation of ICT in Administration of Higher Education Institutions” states that the use of ICT in educational management will benefit for analyzing the data quickly and accurately quick, decision making, provides the power to the Administrators for efficient management of education and institution, reduces the burden of Teachers, available at lowest total cost of ownership, provides information at the door steps and reduces the Right to Information Applications.
- **Meenakumari & Krishnaveni (2011):** In “Transforming Higher educational institution administration through ICT” has identified a comprehensive set of functional areas of e-administration. The study revealed that demographic factors do not have a major impact on e-administration in higher education institutions. It is also evident from this study that integration of ICT into knowledge administration for the teaching–learning process is more in comparison with Research Methodology Computers can be used extensively for educational administration.
- **Ariho Twinomujuni(2012):** In his study of “Problems in ICT implementation in selected Institutions of Higher Learning in Kabale District” identified variables as cost of ICT training materials, skills development in ICT and administrative support in relation to ICT implementation. He found that that there is a statistically insignificant relationship between the cost of ICT training materials and ICT implementation variables. Cost of ICT training materials negatively affected ICT implementation. In respect to skills development in ICT and ICT implementation, he found that there was a statistically significant relationship between the two variables. Skills development in ICT positively affected ICT implementation.

#### STATEMENT OF THE PROBLEM:

The investigator had taken up the problem for the present study is entitled as, “**Information and Communication Technology (ICT): New Approaches in Higher Education**”.

#### OBJECTIVES OF THE STUDY:

The main objectives of the study are as follows:

- To define ICT Based Learning.
- To describe the different aspects of ICT in Higher Education.
- To acquire knowledge of the approaches of ICT in Higher Education.
- To study of the emerging trends in Higher Education through ICT.
- To find out need and importance of ICT in Higher Education.
- To explain the scope of ICT in Higher Education.
- To analysis the applications of ICT in Higher Education.
- To interpret the suggestions about ICT for further development in Higher Education.

#### QUESTIONS OF THE STUDY:

Based on the above objectives of the study the following the major eight questions have been formulated.

1. What is ICT Based Learning?
2. What are the different aspects of ICT in Higher Education?
3. What are the approaches of ICT in Higher Education?
4. What are the emerging trends in Higher Education through ICT?
5. What is need and importance of ICT in Higher Education?
6. What is the scope of ICT in Higher Education?
7. What are the applications of ICT in Higher Education?
8. What are the suggestions about ICT for further development in Higher Education?

#### SIGNIFICANCE OF THE STUDY:

- The investigation like this will be relevant to the field of higher education.
- This investigation will grow more interest among the teachers' in ICT based teaching approaches.
- This investigation will have a way for the students who are choosing ICT based subject.

#### METHODOLOGY OF THE STUDY:

The investigator attempt to study Information and Communication Technology (ICT): New Approaches in Higher Education. In this paper, the investigation was based on different secondary data like abstract, journal, research paper and also different types of books. And also study of questions is used for analysis of data.

#### ANALYSIS AND INTERPRITATIONS:

##### 1. What is ICT Based Learning?

ICT is technology that supports activities involving information. Such activities include gathering, processing, storing and presenting data. Increasingly these activities also involve collaboration and communication. Hence IT has become ICT: information and communication technology. ICT stand for information and communication technologies and is defined, as a diverse set of technological tools and resources used to communicate, and to create, disseminate, store, and manage information. ICT implies the technology which consists of electronic devices and associated human interactive materials that enable the user to employ them for a wide range of teaching - learning processes in addition to personal use. ICT is that technology which uses the information to meet human need or purposes including processing and exchanging. Information and communications technology (ICT) in education is the processing of information and its communications facilities and features that variously support teaching, learning and a range of activities in education.

According to UNESCO "Information Technology is a scientific, technological and engineering discipline and management technique used in handling the information, it's application and association with social, economic and cultural matters".

Darnton and Giacometto defines IT as "Information technology is a systemic study of artifacts that can be used to give form to facts in order to provide meaning for decision making, and artifacts that can be used for organization, processing, communication and application of information."

From the above discussion we can conclude that information technology refers to the information processing of the software application on operating systems or hardware applications that includes computers, videos, telephones and related equipment of telecommunications, tapes, CDs etc.

##### 2. What are the different Aspects of ICT in Higher Education?

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 allround socio- economic development of the nation and global competitiveness. The introduction of ICT in the higher education has profound implications for the whole education process ranging from investment to the use of technologies in dealing with key issues of access, equity, management, efficiency, pedagogy and quality.

- **Student-centered Learning:** 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.
- **Supporting Knowledge Construction:** Learning approaches using contemporary ICTs provide many opportunities for constructivist learning and support for resource-based, student centered settings by enabling learning to be related to context and to practice.
- **Anyplace Learning:** With the help of ICT, educational institutions can offer programs at a distance mode. Today many students can use this facility through technology-facilitated learning settings.
- **Anytime Learning:** Technology-facilitated educational programs remove the geographical barriers. Students are able to undertake education anywhere, anytime and at any place. This flexibility has provided learning opportunities for many more learners who previously were constrained by other commitments.
- **Information Literacy:** The growing use of ICT as tools of everyday life have seen the pool of generic skills expanded in recent years to include information literacy. It is highly probable that due to the future developments and growth in technology, it will help further for information literacy.
- **Computer in the classroom:** Having a computer in the classroom is an asset to any teacher. With a computer in the classroom, teachers are able to demonstrate a new lesson, present new material, illustrate how to use new programs, and show new websites.
- **Class website:** An easy way to display your student's work is to create a web page designed for your class. Once a web page is designed, teachers can post homework assignments, student work, famous quotes, trivia games, and so much more. In today's society, children know how to use the computer and navigate their way through a website, so why not give them one where they can be a published author.

- **Class blogs and wikis:** There are a variety of Web 2.0 tools that are currently being implemented in the classroom. Blogs allow for students to maintain a running dialogue, such as a journal, thoughts, ideas, and assignments that also provide for student comment and reflection. Wikis are more group focused to allow multiple members of the group to edit a single document and create a truly collaborative and carefully edited finished product.
- **Wireless classroom microphones:** Noisy classrooms are a daily occurrence, and with the help of microphones, students are able to hear their teachers more clearly. Children learn better when they hear the teacher clearly. The benefit for teachers is that they no longer lose their voices at the end of the day.
- **Mobile devices:** Mobile devices such as clickers or smart phone can be used to enhance the experience in the classroom by providing the possibility for professors to get feedback.
- **Interactive Whiteboards:** An interactive whiteboard that provides touch control of computer applications. These enhance the experience in the classroom by showing anything that can be on a computer screen. This not only aids in visual learning, but it is interactive so the students can draw, write, or manipulate images on the interactive whiteboard.
- **Online media:** Streamed video websites can be utilized to enhance a classroom lesson (e.g. United Streaming, Teacher Tube, etc.).
- **Digital Games:** The field of educational games and serious games has been growing significantly over the last few years. The digital games are being provided as tools for the classroom and have a lot of positive feedback including higher motivation for students. There are many other tools being utilized depending on the local school board and funds available. These may include: digital cameras, video cameras, interactive whiteboard tools, document cameras, or LCD projectors.

The inculcation of technology-based learning in Higher education needs to be improved with the help of following steps.

- Up gradation of course structure.
- Examination reforms.
- Proper use of technology in education: Overhead projector, Slide-projector, TV (Audio-visual cassettes and aids)
- Technical training to In-service/Pre-service.
- Online teacher education.
- XPDITTE.
- Education through satellite.
- EDUSAT OR GASAT-3

### 3. What are the Approaches of ICT in Higher Education?

Studies of ICT development in both developed and developing countries identify at least four broad approaches through which educational systems and individual schools proceed in their adoption and use of ICT. These four approaches, termed emerging, applying, infusing, and transforming.



- **The emerging approach:**

Higher institution at the beginning stages of ICT development demonstrates the emerging approach. Such schools begin to purchase, or have had donated, some computing equipment and software. In this initial phase, administrators and teachers are just starting to explore the possibilities and consequences of using ICT for higher institution management and adding ICT to the curriculum. Higher institution at this emerging phase is still firmly grounded in traditional, teacher-centred practice. The curriculum reflects an increase in basic skills but there is an awareness of the uses of ICT. This curriculum assists movement to the next approach if so desired.

- **The applying approach:**

Those higher institution in which a new understanding of the contribution of ICT to learning has developed exemplify the applying approach. In this secondary phase, administrators and teachers use ICT for tasks already carried out in higher institution management and in the curriculum. Teachers largely dominate the learning environment. Schools at the applying approach phase adapt the curriculum in order to increase the use of ICT in various subject areas with specific tools and software. This curriculum assists movement to the next approach if so desired.

- **The infusing approach:**

At the next stage, the infusing approach involves integrating or embedding ICT across the curriculum, and is seen in those schools that now employ a range of computer-based technologies in laboratories, classrooms, and administrative offices. Teachers explore

new ways in which ICT changes their personal productivity and professional practice. The curriculum begins to merge subject areas to reflect real-world applications.

• **The transforming approach:**

Higher institutions that use ICT to rethink and renew school organization in creative ways are at the transforming approach. ICT becomes an integral though invisible part of daily personal productivity and professional practice. The focus of the curriculum is now learner-centred and integrates subject areas in real-world applications. ICT is taught as a separate subject at the professional level and is incorporated into all vocational areas. Higher institutions have become centers of learning for their communities.

**4. What are the Emerging Trends in Higher Education through ICT?**

Due to ICT some new and student centered trends come into existence. Some of them are following-

<b>E- Learning:</b>	E-learning is a learning program that makes use of an information network- such as the internet, an intranet (LAN) or extranet (WAN) whether wholly or in part, for course delivery, interaction and/or facilitation. Web-based learning is a subset of e learning and refers to learning using an internet browser such as the moodle, blackboard or internet explorer.
<b>Blended Learning:</b>	Blended learning refers to learning models that combines the face-to-face classroom practice with e-learning solutions. For example, a teacher may facilitate student learning in class contact and uses the MOODLE (modular object oriented dynamic learning environment) to facilitate out of class learning.
<b>Constructivism:</b>	Constructivism is a paradigm of learning that assumes learning as a process individuals ‘‘construct’’ meaning or new knowledge based on their prior knowledge and experience (Johassen, 1991). Educators also call it the emerging pedagogy in contrast to the long existing behaviorism view of learning.
<b>Active Learning:</b>	ICT-enhanced learning mobilizes tools for examination, calculation and analysis of information in order to provide a platform for student inquiry, analysis and construction of new information. The learners therefore, learn as they do and, whenever appropriate work on real-life problems in-depth. Moreover, ICT makes the learning less abstract and more relevant to their life situations.
<b>Collaborative Learning:</b>	ICT-supported learning encourages interaction and cooperation among students, teachers, and experts regardless of where they are. Apart from modelling real world interactions, ICT-supported learning provides opportunity to work with students from different cultures, thereby helping to enhance learners teaming and communication skills as well as their global awareness. It models learning done throughout the learner’s lifetime by expanding the learning pace to include not just peers but also mentors and experts from different fields.
<b>Creative Learning:</b>	ICT-supported learning promotes the manipulation of existing information and the creation of real-world products rather than the duplication of received information.
<b>Integrative Learning:</b>	ICT-enhanced learning promotes a thematic integrative approach to teaching and learning. This approach eliminates the artificial separation between the different disciplines and between theory and practice, which characterizes the traditional approach.
<b>Evaluative Learning:</b>	ICT-enhanced learning is student-directed and diagnostic. Unlike static, text or print-based education, ICT-enhanced learning recognizes the presence of different learning pathways to explore and discover rather than merely listen and remember.

**5. What is Need and Importance of ICT in Higher Education?**

ICT can facilitate learning of learners. Various ICTs have been used to support learning, which include traditional media and electronic media. Technology such as online/Internet is available 24 hours a day. With the use of Internet and World Wide Web, a wealth of learning materials in almost every subject can be accessed from anywhere at any time by an unlimited number of learners. Computer and Internet are the tools for learning and developing skills. Hayes indicates that ‘‘vision of the teacher’s role



needs to shift from that of the information provider to one of the catalyst, model, coach, innovator, researcher, and collaborator with the learner throughout the learning process”. Need of ICT in education can be pointed out as below –

- To store, spread and improvement of knowledge
- Making conducive and creative environment in class
- Expanding educational opportunities
- Increase efficiency
- Enhancing quality of learning
- Enhancing quality of teaching
- Facilitating skill formation
- Sustaining lifelong learning
- Improving policy planning and management
- Advancing community linkages
- Cost effectiveness

#### 6. What is the Scope of ICT in Higher Education?

Technology is an increasingly influential factor in education. Computers and mobile phones are used in developed countries both to complement established education practices and develop new ways of learning such as online education. This gives students the opportunity to choose what they are interested in learning. Technology offers powerful learning tools that demand new skills and understanding of students. ICT brings vast and rapid changes in the almost every aspect of teaching, training and learning. Day by day scenario is being change by these tools. Following is the scope of ICT in education-

- **In Teaching learning process:** In teaching learning process, tools of ICT helps teacher in classroom. Traditional tools are now a matter of old days. Interactive Board, LCD projector, online class, tele-conferencing are new tools for the teacher to make their class conducive and creative. Due to these tools now teachers overcomes the problems of class i.e. individual differences of students, language problem, and effective interaction. Because use of ICT tools class becomes interactive and conducive so knowledge receive by student become stable. Many complex and hazardous experiments now can be perform in classroom by virtual laboratory. This is quite safe and effective without any problems. All these things leads students to become a lifelong learner and to healthy reading habits.
- **In Publication:** In ancient time invention of printing change entire system of education. Due to printing now it was very easy to store and to disseminate the knowledge. Now due to ICT this become more and more easy and accessible. In higher education publication is important activity. Use of Internet readability become more comprehensive. Many Net based services providing many opportunities for researcher and writers to share their thoughts.
- **In Evaluation:** Evaluation is the most important aspect of any process. All efforts may go in waste if there is a faulty evaluative system. Due to invasion of ICT tools in education evaluation becomes very fast and reliable. Online exam become a boon for the students who are unable to attend a formal system. New technologies is very quick in publication and in preparing results. Results can be published online without any delay. Formative and summative evaluation techniques is possible because of ICT.
- **In Research:** Research is the heart of educational system. Research become more and more comprehensive due to emergence of ICT. Now data collection become very easier. Anyone can collect data online from a wide range of population. Different statistical packages prepare results multidimensional for an effective presentation. For study purpose now there is no need to go every university’s libraries. Now a researcher can access not only domestic but also foreign university’s library with the help of Internet.
- **In Administration:** Administration is just like a skeleton. From the advertisement of admission to publishing the results and distribution of certificates, at every steps tools of ICT helps much more. Online admission, online payment of fee, online registration, online class, and online evaluation and at last online certificate, ICT performs an unbelievable responsibility. Easy in management, Cost effectiveness, Time savings.

#### 7. What are the Applications of ICT in Higher Education?

- **Simulation and Good Practice:** New technologies, both computer and web-based allow for simulation of specific skills through mini and micro lessons that can be watched, manipulated and tested.
- **Saving in Time and Expenses:** With in the short span of time we can teach huge masses thus saving money and time.
- **Training (and learning) on Demand:** ICT allows teacher education to take place any time, any place. ICTs (Videos, CD-ROMS, Internet and Software) allow teachers to learn things on demand-when they feel the need for that.
- **Professional and Peer-Support:** ICTs can break the professional isolation by permitting among educators, communication, and exchange of information, chat rooms, bulletin boards, discussion forums, and virtual conferences.

#### 8. What are the Suggestions about ICT for further development in Higher Education?

- **Arranging proper training and regular workshops on ICT for the teachers:** Teachers should be properly trained to use the ICT facility in their schools. Regular workshops on the use of latest technology in teaching are needed also.
- **Proper implementation of ICT infrastructure:** All schools should have internet connection and computer facility for the learners. There should be no disparity between the rural and urban institutions in this concern. There should be adequate e-enabled learning contents in every institution.
- **Support from the higher authority:** Higher authority should encourage English teachers to use ICT in their teaching. Many teachers complain about the lack of support from the higher authority.
- **Using flexible e-enabled learning content for the weaker learners:** There should be enough space for the weaker section of learners in teaching. Arranging flexible e-enabled learning contents for them will be useful.
- **Use of audio-visual aids:** In teaching, use of audio-visual aids will develop listening and pronunciation skills. It will also help the better understanding of the language.
- **Group work method through ICT:** To develop the communication, ICT enabled tasks can be given in groups, such as creating any power point presentation of any grammatical lesson. This will also help to increase the socialization process.

### CONCLUSION:

Today, there is an emphasis placed on technology based learning that supports the active construction of knowledge and skills. That is a shift from educational environment, which supports the passive acquisition of isolated facts, to environment in which the learner actively explores the world and constructs their own models of understanding. Although the lens to future is clouded, must be filtered through the past and present, the ability to stand back and think about the impact of technologies on students learning and teacher education will undergrad research in technology for education of students, children's and youths and adults in the 21st century. We must view the coming change, and they will be massive, from the perspective that technology provides access to learning but doesn't control it, that technologies are not the content of education a rather, they provide a Cornucopia of tools for learning.

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