

## **Information and Communication Technology (ICT) in the Distance Education System: An overview**

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### **Abstract**

*The education system is highly dynamic in nature. Formerly open and distance learning programs relied mostly on the print media, i.e. mailing of print educational materials, radio and television broadcast, telephonic support, EDUSAT-educational satellite. With the evolution of new trends in technology like Massive Open Online Courses (MOOCs), real-time and recorded seminars, real-time video classes, there are various types of effective distance learning systems that provide rapid responses and real time feedback breaking the geographic barriers of communication. Reduction in bandwidth costs and the use of the smartphone has enabled widespread use of internet possible. This has helped people in gaining expertise in multidisciplinary fields and improve their skills easily. Distance education is offered under formal as well non formal educational frameworks and are gaining popularity with the ease of access using mobile technology. It can be used either to supplement or complement traditional classroom teaching learning process. In this paper, we discuss the integration of ICT in the distance mode of learning.*

**Key words:** Distance Education System, MOOCs, real time access, ICT.

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### **I. Introduction**

Distance education provides an opportunity for learners who are not able to participate in the formal education process due to various reasons like disadvantaged groups or people living in geographically remote areas who don't have proper access to education facilities or for those who are engaged to earn the livelihood in the routine time. These may include dropouts, housewives, professionals working in different sectors and other people who can't attend colleges or universities because of socio-economic factors. It is an important and cost effective mechanism to expand the outreach of education and to fill the gap between people and education in an efficient manner. This can help in improving literacy rate of the country by overcoming geographic and socio economic barriers to education. People living in rural or remote areas can be benefited to a large extent with the help of open and distance education programmes. open and distance education can help in improving quality of human resources of the country by providing access to world reputed institutions[1].

### **Brief Background**

Those people who otherwise do not pursue education has got opportunities through a very important mode of learning called distance education. To classify the distance education based on technology used has been considered instrumental since its inception. The technology and distance education are two inseparable entities to reach the student at a distance. What methods of teaching and mode of delivery of content with which technology gives birth to many generations of distance education system.

### **Lack of teacher-student interaction**

Learners in distance education system are not directly involved in regular classroom teaching learning process and learning is facilitated by an institution with the help of various media available. It denotes separation of learner and teacher in terms of time and place. Innovation in technology has been real time interactions between teacher and learner easy and fast where learner can provide instant feedback to the teacher, ask questions and get his queries answered at real time[2].

### **Lack of support**

The learning process in distance education lacks classroom educational experience or face to face interaction between teachers and students, so there is need of adequate continuous support to enable remote learning. Research studies suggest that lack of teacher support leads to high dropout rate and lack of interest in distance learning. Such support may be career counselling, pre admission counselling, subject specific academic

counselling, facilitating access to online study materials, e-learning, mobile learning, videoconferencing, library services, information services, assessment etc.

**Sense of isolation**

Students may also feel isolated from other peers or learners enrolled in the same courses due to lack of interaction. Without peer to peer interaction, distance education programs would serve only as passive mediums for transfer of information. Modern computer mediated communication and use of social media platforms can lead to an increased sense of involvement by enabling one to one communication.

**Self-evaluation**

Lack of evaluation makes it difficult for learner in distance education to check his progress in achieving educational outcomes. But, the use of self-evaluation tools and rubrics in learning management systems can enable learners to self-evaluate himself at any stage to ensure there is learning outcome out of learning activity.

**Lack of control**

Inability to control the pace and progress of the course is another challenge in distance education, but technology has led to self-paced learning environment which is learner centric i.e learner can control speed, time, space of his learning.

**Lack of discipline**

Another problem with these learning programmes is lack of supervision or control of the teacher, but with the use of learning management systems with transparency teacher can have an eye on every activity of the student leading to an increased engagement and discipline.

**Literacy**

Distance education programmes assume that the learner has the basic abilities to learn, write, search for information etc., but there are people with low literacy they often find it difficult to learn in such situations. There must be enough support for such people in distance learning environments. Technology has made things easier for such people with the help of artificial intelligence where people can give voice input to the search[3].

**Evolution of distance education:**

The First generation of distance education was termed as correspondence education where print media were the prime source of educational material and the postal system was used for correspondence and delivery between the institution and the learner. Fig.1. shows the evolution of different generations.

The Second generation of distance education, also known as industrial mode used multimedia like radio and television as media for instruction in addition to use of print media. Telephonic support was used for correspondence between enrolled learners and institution. It is considered highly specialised generation of distance education which lead to division of labour in production and delivering instructional content to the thousands of beneficiaries simultaneously. Industrial model lead to mass education by sharing the same available content and resources among the masses. The concept of open universities came into existence with adoption of distance mode of education.

The applications of telecommunication technologies gave rise to the concept of tele-learning model with synchronous communication between the learner and the teacher, Third generation of distance education used interactive multimedia, Internet, VSAT, videoconferencing, computer aided learning mediums for instruction, computer based communication like emails were used for correspondence.

Currently emerging model used is the fourth generation of distance education also termed as a flexible learning model. It combines the benefits of interactive multimedia with the use of ICT tools and resources to simulate face to face learning. It uses MOOCs (massive open online course), learning management systems, virtual classrooms, internet based resources, e-tutorials, digital libraries, mobile learning, E-learning, social media platforms, computer mediated communication for delivery of content and correspondence.

Evolution of distance education from one generation to another does not necessarily replace the older models, but rather combine or supplement the existing ones e.g print media are still in use along with the television, VSAT but the Internet being used dominantly. Same thing happens with the use of pedagogies, there is not a single dominant pedagogy that can be used for teaching rather we are using different pedagogies integrated in a complex manner[4][5]

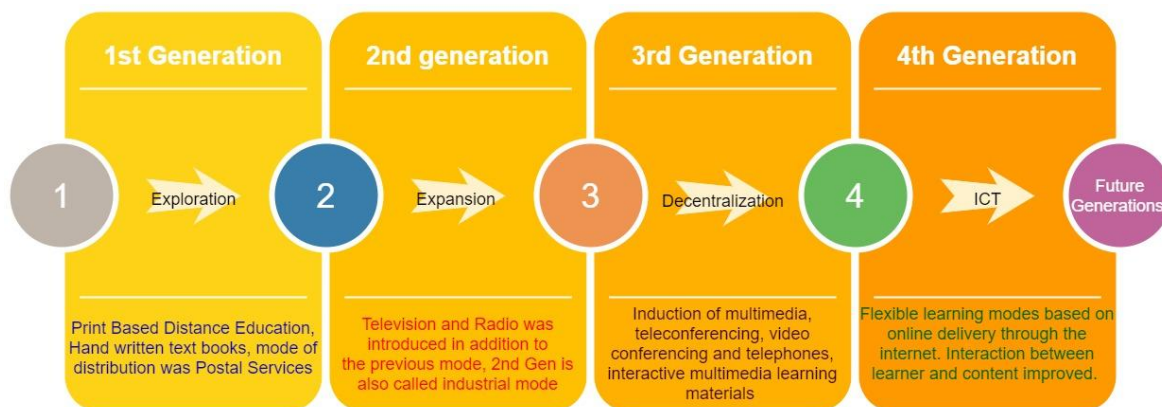


Fig. 1. Overview of Different Generations of Distance Education

### Use of ICT in distance learning

Distance education and technology are considered important for each other as technology has played a great role in reaching out to the students who cannot participate in regular learning environment[6]. ICT is involved in every aspect of distance education from advertisement of admission to course completion, it can help in design and development of course material to its delivery. ICT can be used to meet learner's requirements in distance mode at various phases i.e. in pre- admission phase it can be used for advertising about admissions, in admission phase to publicize programme details, fee structure, registration and re registration, in learning phase for notifying learning schedule, delivery of content, computer based instruction, communication and feedback. In evaluation phase ICT is used for internal assessment, external assessment, assignments and result declaration. In the certification phase ICT is used for certificate printing, issuing and distribution[3].

### Advantages of using ICT in distance education

- **Faster content delivery**  
Increased bandwidth and low bandwidth cost has made real time video streaming easy thus enabling delivery of real-time video classes where students can raise queries and get their doubts cleared instantly.
- **Preparation of instructional material**  
ICT can help teachers in creating their educational content with the help of tools like PowerPoint, excel, video editors etc. Teachers can enhance quality of teaching using multiple modes like hypermedia, images, audio, videos ,etc which can lead to enhanced learning experience by learners. Teachers can access internet for updated information of the subject and also share and reproduce their content with the help of other colleagues by collaborating across the community of teachers[7][8].
- **Accessibility to multitude of educational resources.**  
Internet based resources provides access to quality resources on all the subjects in the form of e-tutorials,videos,animations,lecture notes,encyclopedias,virtual labs,digital libraries,online simulation software and other learning environments.Students can be provided with the user name and password to access various online modules where instructional material is provided in the form of interactive lectures or transcripts.
- **Virtual classroom environment**  
Virtual classroom is an online live environment that allows real time participation and synchronous interaction of educators and learners in the learning activities.this can be made possible with the use of videoconferencing and collaboration software[9].
- **Cost effectiveness**  
Distance learning cuts the costs of in-person classrooms where both the teacher and learner need to travel to a set location in order to start learning. Mass development and distribution of learning material using technology also cuts development costs
- **Enhanced collaboration**  
Increased collaboration between peers and teachers can lead to productive interactions that can help in problem solving .people with different backgrounds, skills and orientations can work together in a virtual environment towards a common goal of learning.
- **Discipline**  
Learning management systems are open and transparent, every activity is monitored by teacher enabling them to keep vigil on the student's activities. This helps in maintaining discipline during the learning process of the course.
- **Peer to peer interaction**

Social media platforms have made it easy and effective to indulge in discussions and sharing of ideas, knowledge leading to formation of learning community.

- Self-evaluation

There are online quizzes, assignments, rubrics for the purpose of self-evaluation which can help learner to adjust his learning in coherence with the learning outcome of the course[10].

- Use of ICT based pedagogy in teaching

With the help of technological advancements ICT based learning environment can choose between wide set of pedagogical tools which can lead to effective learning[11].

- Computer mediated communication

Use of computers and mobile technology has enabled learners to engage in immediate two way communication in professional, social and educational setting depending upon their choice. The use of CMC can help learners in distance education to exchange their ideas with co-learners as well as teachers.

- Feedback

In technology based learning environment, there are options for providing quick feedback during teaching which can lead to formative assessment by the teachers.

- Ubiquitous learning.

Taking the advantage of digital content, mobile devices, pervasive components learning can be supported by technology as anytime and anywhere activity without the constraints of time and space.

- Scalability

Traditional classroom environment can handle 30-40 students, but online platforms can be scaled to include hundreds and thousands of learners. This is made possible by simultaneous access to resources by use of interactive platforms.

- Research.

ICT can be used in research to get updated knowledge about any subject, literature search, data collection, data analysis, research writing, report generations, manuscript submission, collaboration and communication with other researchers etc[12].

- Enhanced quality of teaching

With the advent of global society world class resources, lectures from great scientists, expert lectures are available easily which can enhance the quality of teaching.

- Use in administration activities of the institution[13].

ICT can be used for registration, admission, assessment, certificate distribution as most of the institutions providing distance learning education, conduct all the activities online is eliminating the need for physical participation of the learner.

### **Challenges**

- Digital divide: It is the gap between those, who have healthy access to the internet and those who have poor or no access to the internet. There are still large numbers of the population all across the world, having a weak Internet facility.

- Teachers are not competent to use ICT in teaching: the reluctance of teachers especially senior teachers towards using technology in the teaching-learning process is one of the main reason of not exploring beauty of ICT in the learning strategies[14].

- Inadequate policies: the compliance mode of administrative system has given rise to inadequate policies and needs to be balanced with academic freedom at the teacher-student level.

- An inadequate collaboration between various stakeholders and agencies for efficient utilization of resources: the present age of teaching-learning is meaningless without proper collaboration between different stakeholders and it is still a dream in various institutions.

- Unreliable access to electricity and internet: based on demographic dividend, it is still found the lack of electricity and of course internet facility not upto the mark of expectations.

- Insufficient equipment is available: The poor infrastructure at many places is still a problem. [15][16]

## **II. Conclusion**

The integration of technology especially ICT in the distance education system is emerging as a tool to bridge all those gaps existing between a learner and content as in the previous generations of distance education system. The present intelligent, flexible mode of distance learning is capable of bringing the distance mode of education at par with the regular mode of education in terms of teaching-learning process. The distance education system has been evolved in such a way that the word distance is fading. The tremendous source of knowledge available in the digital cloud can be extremely instrumental in improving the overall efficiency in the distance education system.

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