TEACHING AND LEARNING WITH ICT

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TWENTYFIRST CENTURY PUBLICATIONS
PATIALA

First edition published in 2020 by
TWENTYFIRST CENTURY PUBLICATIONS
79, Sheikhpura, P.O. Punjabi University, Patiala (PB) - 147002
Ph. 99153-98354, 92167-53888
e-mail : rinku_randhawa77@yahoo.com
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In Association with

BOOKMAN
B-41, Sawan Park
Ashok Vihar, Phase - 3
Delhi - 110052

TEACHING AND LEARNING WITH ICT

by

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ISBN : 979-93-89673-69-2

Price : 550/-

Laser Type Setting
Roshan Dhindsa & Manpreet Singh

Printed in India at
Twentyfirst Century Printing Press Patiala

MESSAGE

It gives me immense pleasure to learn that the Department of Computer Science and Applications is going to release a book titled "Teaching and Learning with ICT".

Integration of ICT into teaching-learning process has become the need of the hour. One of the primary aims of education is to make learning an edifying experience. To achieve this objective, it has become necessary to go beyond traditional teaching and learning methods and incorporate ICT enabled education in schools and colleges. It is universally acknowledged that creativity is catalyst for change and advancement in any field. ICT has immense potential for enhancing the learning experience by positively aiding the traditional pedagogical methods. It can become a powerful tool for transforming instructional techniques to promote active learning. Therefore, it is essential for the intellectuals to collaborate to come up with innovative ideas to discourse on the emerging trends in ICT enabled education, challenges in its way and the ways to overcome them.

I hope the views in this books will provide academicians and intellectuals with useful insights into the potential benefits of ICT for teachers and learners. I compliment the Principal and faculty for this initiative.

Mrs. Hema Sharma
President
New S.D. College Managing Committee
Hoshiarpur

MESSAGE

It is a matter of great pleasure that the Department of Computer Science and Applications is going to publish an edited book titled "Teaching and Learning with ICT" in recognition of the importance of ICT enabled education.

The subject chosen is quite relevant in modern scenario. We belong to a digital era. The ubiquitous presence of technology can be felt in every aspect of our life. Information and communication technology can significantly help in providing dynamic and proactive teaching-learning environment. Integration of ICT into instructional process is becoming all the more desirable with a shift in perspective of tech-savvy generation. It will also encourage educators to effectively learn and make use of technology to harness its potential in making learning an engrossing and gainful experience.

I express my gratitude to Mrs. Hema Sharma, Honourable President and Shri Shri Gopal, Secretary and other distinguished members of college managing committee for lending support at every step.

I congratulate the Department of Computer Science and Applications for choosing a pertinent topic for publishing. The views published in this book will surely shed light on the scope of ICT in developing effective pedagogical methods to enhance the quality of education. I extend my greetings for the successful publication of book.

Dr. Nand Kishor
Principal
Sanatan Dharma College
Hoshiarpur

PREFACE

"You never change things by fighting the existing reality. To change something build a new model that makes existing model obsolete" — (Buckminster Fuller)

Information and Communication Technology (ICT) has become a major change agent to modern educational system and has undoubtedly affected the teaching and learningprocess. ICT has the potential to accelerate, enrich and sharpen skills to motivate and engage students. It can help learners to relate their learning to work practices. This book is designed to highlight the role of ICT in quality enhancement specifically in the field of education.

In conventional teaching methods, there used to be more emphasis on contents and a systematised planning to achieve desired outcome. However, it often failed to entirely succeed in instilling critical thinking in learners. The use of ICT promotes independent learning and also takes into consideration alternative theories of learning. With the help of technologies, transformations are facilitated from teacher-centric to student-centric instructions.

Active learning, Collaborative learning, Cooperative learning, Creative Learning and Evaluative learning are the various types of learning that have been promoted through the use of ICT. E, M & U learning have raised the level of education and has tremendously affected the methodology adopted for acquisition and absorption of knowledge. Although ICT has been a boon for teaching-learning process yet it is not without limitations. Besides economic and social challenges, the major issue is to use ICT in such a manner that it helps in retaining environment sustainability.

The vision behind this book is to highlight the importance of ICT in teaching and learning and also to introduce new techniques being followed in contemporary world to enhance quality of education.

We extend a special thanks to Ms. Isha, Mr. Keshav, Ms. Neena, Ms. Neha Nahar and Ms. Amandeep Kaur for their co-operation and helping in reviewing the manuscripts.

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1

UBIQUITOUS LEARNING : A CONTEXT AWARE BASED LEARNING FOR ACQUIRING KNOWLEDGE ANYTIME AND ANYWHERE

Dr. Pankajdeep Kaur & Ms. Nisha Arora***

After the initial impact of computers and their applications in education, the introduction of e-learning and m-learning epitomised the constant transformations that were occurring in education. Now, the assimilation of ubiquitous computing in education marks another great step forward, with Ubiquitous Learning (u-learning) emerging through the concept of ubiquitous computing. It is reported to be both pervasive and persistent, allowing students to access education flexibly, calmly and seamlessly. Ubiquitous learning tools allow improving context-aware as well as learning experiences by offering seamless availability regardless of location all the time. They also help in establishing effortless interaction between authentic and digital learning resources and at the same time offering personalised learning opportunities as well.

Keywords: *U-Learning, M-learning, E-learning, Context Aware learning.*

INTRODUCTION

Ubiquitous Learning is derived from the term "Ubiquitous Computing". ubiquitous computing is computing done using any device, in any location, and in any format. U-Learning provide learners with content and interaction anytime and anywhere.In other words, Ubiquitous learning allow improving context-aware as well as learning experiences by offering seamless availability of information all the time irrespective of location. They also help in establishing effortless interaction between authentic and digital learning resources and at the same time offers personalised learning opportunities as well.According to Hwang et al. [1], u–learning represents: "Anywhere and anytime learning, where the learning environment allows students to access content in any location at any time, no matter whether wireless communications or mobile devices are employed or not". Inclusive, such a paradigm demands that, the u–learning system is able to understand the learners' behavior and real world parameters (e.g. time and location). U-Learning can be defined as:

Ubiquitous = pervasive, omnipresent, ever present, everywhere
Learning = educational, instructive, didactic, pedagogical

The features of U-learning are outlined below:

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1) System continuously senses the learner's location and its surrounding and stores the information into the database.
2) Based on the environment situation it provides right information at right time in right way.
3) System is independent of change in a network while the user is in a motion.
4) System adapts the requirements of the platform that is being used by the learner.
5) Learner never loses his work; it is being stored into the database permanently.
6) Real time streaming provides better quality services.

LITERATURE REVIEW

Implementation of information and communication technology in education sectors has added significant quality to the learning systems. At initial stage e-learning systems were computer-based, where recorded audio and video lectures were being accessed in a computer network. The emergence of internet prepared a platform for the distance learning programs that motivated the e-learning approaches. Today e-learning is equipped with web-based learning, virtual class rooms, web conferences, smart classes, virtual laboratory, online learning and management systems. E-learning offered new ways for students to access many resources. This was a major breakthrough in education leading to better management of both in-house tertiary education and distance education[2].

After the popularity of e-learning, there came era of m-learning(Mobile-learning). M-learning or mobile learning is "learning across multiple contexts, through social and content interactions, using personal electronic devices". Author in [3] believed that m-learning had been a new stage in the progress of e-learning and that it resided within its boundaries. M-learning was not only wireless or Internet based e-learning but also included the anytime/any place concept without permanent connection to physical networks. The advantages of m-learning compared to e-learning include: flexibility, cost, size, ease of use and timely application. The devices used include PDAs, mobile phones, portable computers and Tablet PCs.

Recent progress of wireless technologies has initiated a new trend in learning environments, u-learning which is able to sense the situation of the learners, and hence provide more adaptive supports[4]. a ubiquitous learning environment is a situation or setting of pervasive (or omnipresent) learning. Education is happening all around the student but the student may not even be conscious of the learning process. Source data is present in the embedded objects and students do not have to DO anything in order to learn. They just have to be there.[5]

COMPARISON: E-LEARNING V/S M-LEARNING V/S U-LEARNING

It is observed that u-learning is a combination of m-learning and e-learning with some additional technology that provides real time and context based application.

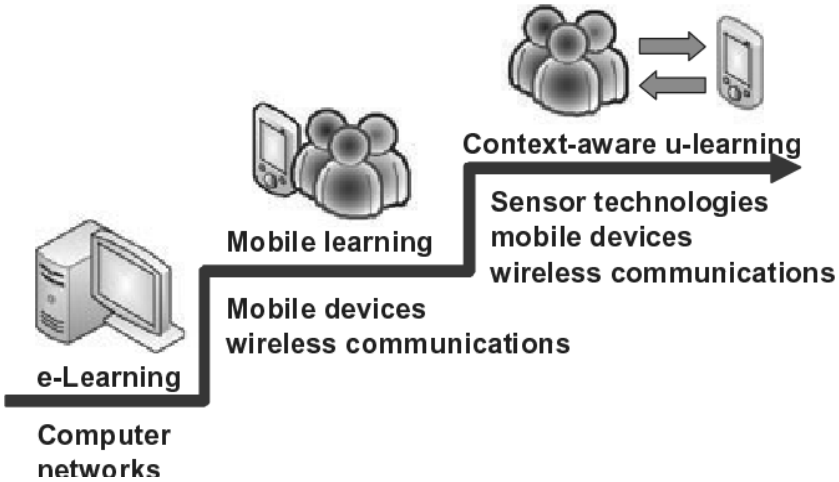

Fig1: Comparison of emerging learning technologies

Table 1 shows some key features comparison of latest learning technologies

Table1:E-learning v/s M-learning v/s U-learning

Features	E-learning	M-learning	U-learning
Software requirements	Operating system, TCP/IP protocol suit, internetworking communication technology and required applications	Mobile operating system, WAP, GPRS, GPS, some specific applications, Bluetooth, Wi-Fi and wireless communication technology	Operating system, Location aware protocol, sensor network software suit
Hardware requirements	Internet connection CD, desktops, mobile devices, webcam, television etc.	Mobile devices, internet connection	Sensor networks, wearable computers, Geographical Information System, Virtual reality based projector, RFID system.
Computation Technique	Cloud computing	Cloud + mobile computing	Cloud + mobile + Context aware computing
Connectivity required	Usually Wired	wireless	invisible
Approachability	Restricted to a geographical area	Anywhere, any time.	Everywhere, every time in a right way
Usability	Simple to use	Moderate to deploy	Highly complex
Action	Watch	Do	Feel

U-LEARNING MODEL

The two main factors in this design are the 'what' and the 'how'. The 'what' is the model itself which resembles an interactive learning gallery and uses a wireless network with both Bluetooth and WiFi technologies. The 'how' is the inclusion of pedagogical information which is based on

constructivist theory, allowing students to create knowledge from what they see, hear, read and perceive. Students using the U-learning will intuitively interpret their surroundings and construct their own knowledge.

Components of the U-learning model include:

1. Microprocessors with memory will be embedded in every object/device. The information each microprocessor will hold will be about the object. When a student approaches, the sensor detects their presence and will start relaying information to the student's PDA.
2. Server Module will include the Server, the Educational Strategies Unit and a Database: The U-learning server manages the network resources; The Educational Strategies Unit allows for the application of strategies to reinforce and aid student understanding through interaction and feedback. It analyses student responses to short quiz questions and returns more information or information in a different form when needed; DataBase – stores all the data about the 'objects/ devices', the users and the interactions that occur.
3. Wireless technology – this will be in the form of Bluetooth and WiFi: Bluetooth has weak signal strength, uses little power and covers a relatively short distance. Its low power consumption and ability to communicate with many devices is extremely beneficial when using handheld devices. WiFi, based on the IEEE 802.11 specification, has a range and speed which surpasses that of Bluetooth. It is compatible with any brand of Access Point and client hardware built to the WiFi standard
4. Sensors will be used to detect any changes in surroundings. These will be placed adjacent to the objects/devices and will be used to recognise the presence of students. The sensors used will include proximity, to detect movement, and light, to detect changes in light intensity.

FUNCTIONALITY OF U-LEARNING

Diverse functionalities are specified to define how the system should work, as well as how academics and students are expected to behave[6].Six types of functionalities are commonly deployed: educational support, system awareness, user–centered, assessment ,games and other functionalities.

a) Educational support: The substantive goal pursed by u–learning approaches corresponds to the educational support that such systems provide to academics and learners. Particularly, labelled as: content delivery, learning and teaching.

- *Content delivery*. This support concerns the way content is authored and provided to learners, as well as how they navigate and interact with it.
- *Learning.* The aim of u–learning is to facilitate and enhance students' apprenticeship. U-learning Learning concerns with domain knowledge acquisition, development of cognition, stimulation of spatial ability and visual–motor integration
- *Teaching.* Domain knowledge, skills, values, attitudes are just a sample of teaching assets that academics pursue to instill in students based on some guide. Prominent guide is the "Pedagogical framework for understanding" that helps teachers to integrate technologies into classrooms to promote self–directed, collaborative, and seamless learning amongst students.

b) System awareness: A key smart property in u–learning is system awareness, functionality that enables the approach to notice changes in the environment, particularly those related with the context, learners, and locations as follows:

- *Context–aware*: The u–learning scenery is conscious of the status and events that occur in the setting where students are walked through. For example, the "Personalized context–aware recommendation learning system" uses geographical positioning system (GPS) and the quick response code (QR) interface input with the purpose of enabling learners to immediately save external contents as learning materials.
- *Learner–aware:* The u–learning approach is aware of where the students are in the setting and what they are doing during the learning experience by means of a device such as tablets or PDAs For example, based on the diagnosis of learning tasks and assessments, constructive feedback is automatically generated to deliver real–time and personalized suggestions for further learning
- *Location–aware:* The u–learning system provides instant support to students according to their individual real–time status, where technology such as radio frequency identification (RFID) and GPS are used. As an instance, an approach to guide users during a trip providing along the way suitable information, a quiz, or multimedia content according to the locations they visit, as well as recommendations for a next point.

c) User–centered: In order to facilitate students Domain knowledge acquisition, diverse u–learning approaches focus on user–centered paradigm to provide personalized educational services according to learner's needs, specifically for adaptation, navigation and recommendation purposes.

- *Adaptability:* In this sense, u–learning demands constant meaningful learning evaluation of students' performance to provide real–time adaptive and personalized learning activities for students with different levels of achievement.
- *Navigation:* It is related to situated and authentic learning because it concerns the design of personalized learning paths based on the users' traits to enhance their experiences in a physical environment that engage students in developing and organizing knowledge for differentiating a set of learning targets in the real world.
- *Recommendation*: Due to all the learner' dynamic context being linked with their educational goals, the environment is able to provide suggestions about content, event, point or individual that are available for the user at a specific time and place.

d) Assessment In academics, assessment is a key process for estimating the students' achievement of learning goals, and therefore the educational system. Indeed, different assessment delivery media, such as paper and pencil, or mobile devices as well as computer–based lead to different assessment modes. For instance, students monitor and evaluate their own learning by a series of self–assessment tasks to determine how such a process bias their motivation, engagement, and learning. Another case represents the assessment of authentic learning situations, such as workplace healthcare, where evaluation scales inquiry about whether students understand how to use domain knowledge in realistic situations, the availability of means for evaluating learners' performance in realistic life situations, and verify how well connected the acquired domain knowledge is with real life.

e) Games: Digital games exhibit very attractive pedagogical sceneries for users interested in acquiring domain knowledge through entertaining and simulated experiences, where they play a given role to achieve their goals in u–learning environments e:g Novice drivers have been users of a gamified logbook smart phone application, which facilitates them to undertake a broad range of

practice in an enjoyable and motivating manner

f) Other functionalities: In addition to prior functionalities, u–learning deploys other specialized ones, as the support for writing processes, which provides Augmented reality content to encourage learners for writing activities in a variety of settings .Other functionality corresponds to tracking and monitoring time to develop users' time management skills based on mobile notifications that clearly prompt user what to do next Moreover, the design of information presentation mode is a functionality delivered through mobile devices that helps students to maintain their concentration during the accomplishment of their learning activities. On the other hand, information management concerns the logs generated as a result of the interaction between users and the u–learning system, as well as their peers, which represent diverse features that describe learner's behavior and achieved outcomes

CONCLUSION

In this work an overview of u–learning has been shaped to provide a landscape of its nature, model and functionality. The concept of ubiquitous computing and u-learning goes beyond portable computers. As new technologies evolve and more pervasive forms of technology emerge, computers will become 'invisible' and will be embedded in all aspects of our life. Many technologies have become integrated into our lives over the years, for example: the telephone; television; PCs; the Internet and mobile phones. These innovations may have appeared strange and futuristic at first but, over time they blended into our everyday lives. In this age of progress and great change, we tend to easily adapt to the technologies and pedagogies that emerge. Ubiquitous technology and u-learning may be the new hope for the future of education.

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2

ROLE OF ICT IN PROMOTING PROFESSIONAL COMMITMENT OF TEACHERS

Monika Abrol & Dr. Nand Kishor***

The new technologies in the digitalized world has gained momentum in all spheres of life as technology related skills are a key factor in professional settings. In the changing scenario of the world, everything needs change especially in the domain of education. Education is the essential foundation of a thriving and innovative society.Through educational paradigms and modern ICT, a variety of tools, technologies, content and resources aim at improving the quality and efficiency of the teaching learning process. Students learn from the invisible curriculum of the lives of the teachers, principals and institution that form the visible curriculum. The most effective way to improve students learning outcomes is the quality of teaching through new technology and innovations. In this way, teachers play a key role with their competencies in using new technologies. As models of school development and school effectiveness, professional commitmentof teachers lay emphasis on use of computers more frequently in the classrooms and teaching ICT skills in the classrooms.

Keywords: *Professional Commitment, ICT*

INTRODUCTION

New technologies have come to play an important role in the individual's participation in society thereby providing access to information. The exchange of information in this world have come to effect all spheres of life, making the skills necessary for today generation. Teachers are facing challenges of imparting these skills to future generations of professionals. Imparting these skills require competence on part of teachers or instructors who are a backbone of the society. Their continuous professional commitment includes dynamic and integrated approach, new methodologies and integration of new technologies. Technology has revolutionized our present society. In the classroom, we present our knowledge to our pupils in a linear and didactic way that differs from the previous experience of students. The result is the mismatch between the teacher and the student. The divergence between our children and educational practices needs a drastic reform that will bring the classroom into line with the society and close the gap and reunite our schools and rest of the society.

OBJECTIVES OF ICT IN EDUCATION

- To develop and promote openness for critical thinking in innovative atmosphere.

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** Principal, SD College, Hoshiarpur.

- To bridge the gap between the government and teachers, urban and rural by providing them opportunities for effectively use technology to further meet educational objectives.
- To transform institutions of teacher education.
- To provide students a new era for ensuring them away from the chalk and talk, enjoyable, non- threatening and self- paced.
- To enhance quality of teaching and learning in the classroom.
- To make teacher role as a facilitator.
- To maintain professional development of teachers by providing the opportunities for using new technology in the digitalized world.
- To enhance the skills of pupils through use of ICT global wise.

NEED OF ICT IN THE PRESENT SCENARIO

In the recent times, the importance of ICT is widespread. There is urgent need to disseminate knowledge and information all over the world especially in the field of education. The importance of ICT is discussed interms of following

- ICT can be used to disseminate information about and catalyze adoption and distribution of educational resources across various media and forms to promote its availability and extensive use.
- There is dire need to digitalize and make available of educational audio and video resources.
- ICT can be widely used for disseminating print resources like books, documents, handouts, charts and posters where these are used in the school system.
- ICT can address teacher capacity building, ongoing teacher support and strengthen the school system's ability to manage and improve efficiency of school system.
- With the help of computers and internet, there are diverse kinds of software tools, interactive devices can be used to promote creative and analytical abilities among students as well as teachers.

INFORMATION AND COMMUNICATION TECHNOLOGY

During the last few decades, IT in education has included research to develop a deeper understanding of ICT in Education. NCFTE seeks teacher education models as self- directed and self- paced. Through the Subject Teacher Forum Program' (STF) and collaboration with that of Rashtriya Madhayamika Shiksha Abhiyan (RMSA), the Govt. has set up a reality set up through a program design which gives empowerment to teachers in sharing curricular resources with one another.

According to NCTE framework (1998).," Teacher Education is a program which aims at the development of teacher as a person and agent of social change. The professional preparation of students who want to enter the profession of teaching, teacher education prepares them, for attaining the national goals of education for all, to preserve the continuity of traditions, to fulfil the actual needs of contemporary society, to meet the challenges of the uncertain future through education".

Main Areas of Work Recommended by STF Program

The focus is on main areas of work given below

- Engagement with the selected schools for building communities of teaching associated

with learning.

- Teacher Educator's ability in promoting ICT in Education.
- Conducting research.
- Different programmatic work and also work for policy advocacy.

Ways and means to enhance Professional Commitment of Teachers Through ICT

There are different ways through which professional commitment of teachers can be enhanced in integration with the use of ICT as follows.

- **Curriculum Development through ICT:** Informational Technology has given us a vision to participate in different work groups which deal with curriculum design and also integrating ICT in these kinds of designs. The main aim is to incorporate ICT Education in teacher Education as well as classroom learning as an integrated system. The role of SCERT is to provide social science and geography textbooks to the students that are the part of Eklavya project.
- **Research:** Tata Institute of Social Sciences Research Project aims to understand how teacher resource centres are working. ICT is integrating into the functioning of these resource centres to analyze data about the functioning of these centers.
- **Training through Teleconferencing:** NCERT has given emphasis on orientation program for the secondary teacher of KV schools, Navodhaya schools and CBSE schools on the use of text books developed by NCERT during the year 2007- 2008. These programs were conducted and disseminated their information through video tape and two-way audio technology.
- **Web based Learning:** Govt. of India has taken initiatives in promoting e- learning throufh video lectures and web based learning materials. These kinds of learning enhance the professional development of teachers through NPTEl and spoken tutorials from IIT Bombay.
- **Blended Learning:** The use of blended learning makes combine the traditional classroom methods with e- learning thereby creating a new and independent study which is named as hybrid study.Modern blended learning emerged as an important technique for development of online and offline course content and also to guide the students for use of this learning for independent study. The role of teacher is to facilitate classroom activities and provide the use of tools of technology which makes the teacher in his own development.
- **Models of Teaching:** Models of teaching are the patterns of teaching which make teaching effective. NCERT in 1984 organized seven orientation programs to develop awareness among students about the models of teaching.
- **ICT as Management of Learning:** It refers to the application ofsoftware used for organizing and management of institutions broadly refer as educational management information system. Use of ICT for record keeping and database, examination and other administrative purposes are some of the applications in this field.
- **ICT as Medium of Teaching and Learning:** This refers to ICT as a tool for the purpose of teaching and learning itself. Morethan three decades ago, computers and related information technologies wereintroduced to educators for direct teaching and learning purpose. It started withCAL//CAI, then moved to Multimedia courseware and finally to Web Basedinstruction & Computer Mediated Communication (CMC) systemwith the help of CAI, basic skills can be highly effective according to use. In this way, students learn more rapidly and improve their learning,

Use of computer assisted instruction (CAI) is shown in all subject areas, from preschool to

higher education, and in bothregular and special education classes. Effective instruction requires presentinginformation, guiding the learner, practice, and assessment of student learning. Computer is used to provide any combination of these factors may be termedcomputer-assisted instruction. Any combination of these can be appropriate computer intervention in the learning process. Interactivity, flexibility and learner control are the main peculiarities of these technologies. The application of educational technologies to instruction has progressed beyond the use of basic drill and practice software which now includes the use of complex multimedia products and advanced networking technologies.In this way, teachers provide the students a platform to use multimedia to learn interactively and work on class projects. Hence,they use the Internet to do research, engage in projects, and to communicate.

The Notion of Professional Commitment of Teachers.

The notion of professional commitment of teachers are greatly affected through technology and use of technology. The professional commitment of teachers is taken in terms of school development and school effectiveness. ICT related professional development activities make teachers responded to forum of teaching and learning. Teachers use ICT based lessons based on the curriculum which help them to improve the classroom teaching. The emphasis on teaching through ICT and different skills results in their continuous professional commitment and exploring new ways to students through accessing information efficiently, evaluating the credibility of digital informationand providing references for digital information resources.

FUTURE PERSPECTIVES

- Implementing technology in the classrooms especially Engineering based technology which aims at providing excellent methodological solution for collaborative design and development involving schools, researchers and technology.
- For successful technology in schools, teacher professional commitment includes introduction of new technology in the classroom that is integrated into existing pedagogy.
- Opening up a new pedagogical space to promote student dialogue and collaboration encourage teachers as well as students to effectively use educational technology in schools.
- Encouraging Teacher education programs for in- service teachers to develop, adopt and deliver appropriate curricula that promote teacher as well as learner progress. Which results in continuous professional development of teachers from pre- service to in- service and lifelong professional learning.
- Many ICT based International Development Education Projects have a narrow focus on hardware and software. There is dire need for better teachers for disadvantaged children focusing on use of mobile technology and its use.
- Last but not least, the educational content needs to be appropriate for students and their learning. Content needs to support teachers as it promotes the effectiveness of teaching and learning.

CONCLUSION

The present scenario of teaching requires competent, hard- working and innovative teachers. The role of teacher is that of facilitator which facilitate the process of teaching learning through use of ICT in this digitalized world. The continuous professional; development of teachers is seen in context of adopting new ways of teaching, by promoting ICT in schools. As ICT in school programs

help the teacher to communicate well to their students. Even it equips educationists to keep in mind educational aims over narrow technology literacy goals. In this way, these kinds of programs help the teacher as well as learner in making a social constructivist digital environment which provide the teaching learning process a new paradigm and teacher find himself more committed to the organization as well as to the society.

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3

NEW TECHNOLOGIES FOR TEACHING AND LEARNING WITH ICT

*Er. (Mrs.) Pooja**

The application of Information and Communication Technologies (ICTs) is already changing the organization and delivery of higher education. The pedagogical and socio-economic forces that have driven the higher learning institutions to adopt and incorporate ICTs in teaching and learning include greater information access; greater communication; synchronous and asynchronous learning; increased cooperation and collaboration, cost-effectiveness and pedagogical improvement. However, ICTs have not permeated to a great extent in many higher learning institutions in most developing countries due to many socio-economic and technological circumstances. This paper discusses new learning and training technologies considering their pedagogical, cost and technical implications. It also discusses challenges for integrating these technologies in higher learning institutions with examples from Tanzania, and giving best practice approaches for addressing each of the challenges.

Keywords: *E-learning,Information and Communication Technology ,teaching and learning technologies*

INTRODUCTION

Developments in Information and Communication Technologies (ICTs) have impacted all sectors of society, including the education sector. In higher education, application of ICTs in form of e-learning is already changing teaching and learning processes. There are many pedagogical 1 and socio-economic factors that have driven higher learning institutions to adopt e-learning. These include greater information access; greater communication via electronic facilities; synchronous learning; increased cooperation and collaboration, cost-effectiveness (e.g. by reaching different students and in greater numbers) and pedagogical improvement through simulations, virtual experiences, and graphic representations. Both trainers and learners can choose more appropriate applications which are flexible in time, in place, personalized, reusable, adapted to specific domains and more cost-efficient.

On the other hand, there are a number of challenges that face universities in developing countries as they seek to implement the e-learning systems. AAU (2001) asserts that African universities which should be in the forefront of ensuring Africa's participation in the ICT revolution, they are themselves unable and ill-prepared to play such a leadership role. This is because of the information infrastructure of African universities which is poorly developed and inequitably distributed.

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This paper discusses the application of ICTs in teaching and learning by reviewing the e-learning context, and then focuses on the pedagogical, cost and technical implications of different ICTs that can be used for e-learning purposes. Few examples are also picked from some universities in Tanzania. Challenges for integrating these technologies in higher learning institutions in developing countries are discussed, giving best practice approaches for addressing each of the challenges.

E-LEARNING IN CONTEXT

E-learning refers to the use of ICTs to enhance and support teaching and learning processes. It is the instructional content or learning experiences delivered or enabled by electronic technologies and it incorporates a wide variety of learning strategies and technologies. E-learning ranges from the way students use e-mail and accessing course work online while following a course on campus to programmes offered entirely online. It is thus an alternative solution, which enlarges accessibility to training and becomes essential to complement the traditional way of teaching (i.e. face-to-face).

E-learning encompasses a continuum of integrated educational technologies. At one end are applications like PowerPoint, which have little impact on learning and teaching strategies or the organization. At the other end are virtual learning environments (VLEs), and managed learning environments (MLEs), which can have significant impact upon learning and teaching strategies, and upon the organization. In the supplemental use of ICTs to complement traditional learning experiences, the instructor teaches all sessions in the classroom but with the occasional use of technology, such as Webbased activities, multimedia simulations, virtual labs, and/or online testing.

Blended learning denotes a solution that combines several different delivery methods, such as collaboration software, web-based courses, computer communication practices with traditional with traditional face-to-face instructions. On the other hand, distance learning is conducted solely online where interaction may be synchronous or asynchronous.

Synchronous learning requires the teachers and students to interact at the same time though they may be dispersed geographically. On the other hand, asynchronous learning allows teachers and students to interact and participate in the educational process at different time irrespective of their locations .Actually, the use of synchronous with asynchronous activities is determined by the available technology, cost, and maintenance and is adjusted to suit each course, instructor and audience.

E-LEARNING TECHNOLOGIES

Functionally, e-learning includes a wide variety of learning strategies and ICT applications for exchanging information and gaining knowledge. Such ICT applications include television and radio; Compact Discs (CDs) and Digital Versatile Discs (DVDs); video conferencing; mobile technologies; web-based technologies; and electronic learning platforms. This section discusses what these ICTs entail and their pedagogical, technical and cost implications.

Television (TV) refers to a receiver that displays visual images of stationary or moving objects both live or pre-recorded and mostly accompanied by sound which is electronically captured, processed and re-displayed. Likewise, this applies to the term radio – both live generated sound as well as pre-recorded sound. Both TV and radio can improve teaching and learning process in different ways such as by showing processes and activities that may not otherwise be available to the learner. However, digitalization has taken over analog audio and video systems.

Compact Discs (CDs) and Digital Versatile Discs (DVDs) are based upon laser technologies for writing and reading data. They provide a way in which a large amount of multimedia training material can be stored and made available to end-users: CD-ROM can store up to 1GB while DVD can store up to 17 GB. CD-ROM and DVD-based products can be linked with online information sources. This hybrid approach provides the user with access to media-rich up-to-date information.

Video conferencing is a system where two or more participants, based in different physical locations, can see and hear each other in real time (i.e. live) using special equipment. It is a method of performing interactive video communications over a regular high-speed Internet connection. A videoconference can be either two-way (point-to-point) or multipoint, linking three or more sites with sound and video. It can also include data sharing such as an electronic whiteboard where participants can draw on, or text based real time 'chat'. Interactive whiteboard is simply a surface onto which a computer screen can be displayed, via a projector (Department for Education and Skill, 2004).

Mobile e-Learning (sometimes called 'm-Learning') is a new way to learn using small, portable computers such as personal digital assistants (PDAs), handheld computers, two-way messaging pagers, Internet-enabled cell phones, as well as hybrid devices that combine two or more of these devices into one (Hunsinger, 2005). These technologies have enormous potential as learning tools.

World Wide Web (WWW) is set of software tools and standards that allow users to obtain and distribute information stored on a server and connected to Internet. WWW is a decentralized information system, in which anyone can add new information whenever he/she wants. Lecture notes and other teaching materials are placed on the WWW and linking useful websites to these resources for students to access. In the recent years, web and Internet technologies have matured significantly by providing a uniform access media for both asynchronous and synchronous learning. This phenomenon has significantly increased the popularity of on-line learning (Chen et al., 2004). The usage of web technologies in e-learning are further enhanced with the web 2.0, which is a set of economic, social, and technology trends that facilitate a more socially connected Web where everyone is able to add to and edit the information space (Anderson, 2007). These include blogs, wikis, multimedia sharing services, content syndication, podcasting and content tagging services (Anderson, 2007).

PEDAGOGICAL, TECHNICAL AND COST IMPLICATIONS OF E-LEARNING TECHNOLOGIES

e-learning technologies	Pedagogical implications	Technical implications	Cost implications
TV/Radio	Effective use of TV/radio depends on three key moments in the application: before, during and after the viewing session and give instructions, explanations, questions or evaluation before and after each moment	Equipment are needed depending on the objectives and the scope of the training application, which includes audiocassette, video camera, PCs, editing software, distribution channel and receiving and displaying equipment.	Costly in terms of TV/radio production, which includes, animation and graphic designers, hardware, access to the broadcast network

e-learning technologies	Pedagogical implications	Technical implications	Cost implications
CD/DVD	• Simulation for self-study • Used with the presence or remote support of the trainer	Hardware that meets their specifications - graphic screens, MPEG2 cards, CD or DVD reader and appropriate software	Costs are higher than for printed materials - replication downloading free products or buying ready-made products can lower the costs.
Web-based technologies	Permanent accessibility (24 hours, all days of the week), speed, direct communication, links to related topics and up-to-date notes.	Fast computers with sound cards and reliable Internet connection are required. • The following team is needed for implementing web-based training: (a) Hardware, technical expertise and Internet subscriptions costs New technologies for teaching and learning 61 Instructional designer familiar with computer delivered instruction; (b) A programmer or author to use the authoring tool; (c) A graphic artist; (d) A subject matter expert; (e) A webmaster for maintaining the programme on the server	Hardware, technical expertise and Internet subscriptions costs
videoconferencing	New pedagogical methods required to provoke interaction • Require small groups • Both trainers and learners require some basic training	Required equipment : (i) Sound proofing and controlling the lighting conditions; (ii) Audio-visual peripherals – TV monitor or video projector, camera(s), microphone(s) and sound playback; (iii) Videoconferencing codec (Rollabout) (iv) Multimedia PC (with PCI-based as well as software based video conferencing codec) (v) More bandwidth is needed for higher-quality images	There are two types of costs: setting up the videoconferencing system and operational costs.

e-learning technologies	Pedagogical implications	Technical implications	Cost implications
e-learning platforms	Adding and changing content as course is progressing. Template for inclusion of course content. Support multimedia presentation of course content while others are text based. Complex structuring of content allowing for multiple links and cross reference possibilities.	(i) Server platform hardware requirements; (ii) Client platform hardware requirements; (iii) Operating system/cross platform; (iv) organization/registration/ administration; and (v) The learning content should be in standard formats that can easily be stored, accessed and distributed. Such formats include HTML, PDF, RTF, GIF, JPEG and MPEG.	• Hardware cost implications • Cost for maintenance Operational costs (technical and administrative support) • License fee (annual fee).

ICT IMPLEMENTATION CHALLENGES IN HIGHER LEARNING INSTITUTIONS

Lack of systemic approach to ICT implementation*:* Integration of ICTs in the functions of anyorganization is a complex process that needs to be fully conceptualized and defined from thebeginning. However, this is not the case in many higher learning institutions in developingcountries as most of them have embraced the ICT integration process without clear plans toguide the way. The institution ICT policy and strategic plan should be defined to provide aframework for the development and implementation of specific ICT projects. The diversity andcompeting interests of different stakeholders in the institution should be recognized whendeveloping ICT policy and a strategic plan. The following issues, amongst others, should be takeninto consideration:

(i) ICT infrastructure already in place;
(ii) ICT skill levels in the institution;
(iii) number of staff and students in each department and projected growth;
(iv) academic management process: curriculum development, assessment methods and administration;
(v) cost-effectiveness analysis (including hidden costs) and the choice of proper technologies for theneeds of the institution;
(vi) staff development in new technologies

Awareness and attitude towards ICTs*:* It is important for all stakeholders in the institution to knowthe existing ICT facilities and services and their importance in relation to their specific tasks. Formally organized awareness programmes, visits to similar institution where success has occurred, and short trainings can contribute to raise the awareness and change the attitude of stakeholders towards facilities and services.

Technical support: This includes issues like installation, operation, maintenance, network administration and security. This is an important part of the implementation and integration of ICTin education system. In most cases however, technical support is not available, which implies thattrainers and students require some basic troubleshooting skills to overcome technical problemswhen using

ICTs. Appropriate strategies should be in place to ensure that integration ofICTs in teaching and learning process goes together with the recruitment, training, retaining andretention of required staff.

Staff development*:* Integration of ICT in teaching and learning does not only deal with introductionof new hardware and software, but both trainers and the students have to adopt new roles, andchange their ICT behaviours and ways of teaching and learning. Training and workshops are needed not only to improve the skills of the instructors, but also as a means of getting them involved in the process of implementing and integrating ICTs in teaching and learning.

Inadequate funds*:* Financial resources form a key factor to the successful implementation and integration of ICTs in education. It is obvious that countries with higher financial resource basesstand a good chance than those with limited resources to reap benefits offered by ICTs. Inaddressing the problem of limited funds and sustaining donor funded projects, higher learninginstitutions can do the following: (i) adopt freeware and open source software for teaching andlearning activities; (ii) continuously press for more funds from their governments; and (iii) diversifysources of funds to have a wide financial base.

Lack of ownership*:* It is critical that all stakeholders contribute to and own the policy and the plan.Institution-wide consultations are necessary in the identification of challenges, and in proposingareas for ICT application. Stakeholders must agree on the projects to be implemented, includingtheir role therein. Employees must see ICTs as tools rather than as competitors for their jobs. Arelated challenge is getting stakeholders in an organization to think for the organization, ratherthan the natural tendency of considering the interests of their particular departments.

CONCLUSIONS AND RECOMMENDATIONS

ICTs provide great opportunity for universities in developing countries to improve their teachingand learning processes. So far most of the universities in developing countries possess basicICT infrastructure such as Local Area Network (LAN), internet, computers, video, audio, CDs andDVDs, and mobile technology facilities that form the basis for the establishment of e-learning. Itis argued that, universities in developing countries should adopt e-learning technologies toimprove teaching and learning processes. Pedagogical, technical and cost issues should betaken into account for each specific technology when integrating ICTs in teaching and learningpractices.

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4

RECENT TRENDS OF ICT IN CLASS ROOM TEACHING

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Gone are the days of Gurukuls and open air classrooms. The field of teaching like all other fields is witnessing absolute changes in content and effectiveness, Academic pursuits of all the knowledge seekers and changing their modus operandi for the final outcome of their efforts. The shape and direction of a classroom teaching is now changing ends from being text centric to ICT centric to a large extent. Many techniques are being applied to the scholastic ways in schools and colleges. Tablets, mobile phones cloud computing and similar such sources help the educationists in taking a classroom to an altogether next level of academic pursuit. The chapter is an effort to count such techniques and sources and make their value count in modern times. Their use not only makes teaching interesting and more result oriented but makes students participative listeners and contributors.

DIGITAL TRANSFORMATIONS IN INFORMATION COMMUNICATION TECHNOLOGY

In the present highly modernized and techno savvy world, the **Information Communication Technology** has enhanced its usage and trends simultaneously. There are huge numbers of significant parts of education. Both teaching and schooling has seen changes with the new context. ICT offers some of the variations which are integral to our day-to-day life.

The introduction of latest **ICT trends and technologies** has brought holocaustic changes in the method of living, working and communication for a large number of people. This leads to the educational approach that inched the society and school in close proximity. In the 21st century, the education system must follow the set up that positively contributes to the growth of critical citizens and improved society.

GROWTH IN THE TECHNOLOGICAL FIELD

In the previous days, the world has witnessed an extraordinary growth in computer networking, communication technology, and **information technology**. The introduction and growth of new broadband communication services has catered in innumerable possibilities to use a variety of new technological tools for teaching and learning system alike.

Communication and **computer integration** offers unprecedented opportunities for education systems. It hasa capacity to integrate, commingle and interact with each other over a vast geographic distance to attain the objectives of education. The multiplicity of these systems along with their easy maneuvering and the power and diversity of information sharing enables students and teachers to

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access a world beyond the boundary of a classroom.

TEACHING WITNESSES A STANCE SHIFT

Education is witnessing major paradigm shifts in its teaching and learning practices all across the world. This has become feasible due to the **latest trends in Information Technology** that stimulate an effective learning environment. In previous times, learning via drill, factual details and practices, rules and procedures was more suitable while the same through projects and problems, discovery and invention, all inclusive creativity and diversity, action and contemplation has perhaps become more appropriate for the present times.

The major impress of this learning transition varies from teacher-centric to learner centric paradigm. Over a span of the last three decades, the changes in the educational environment have been unprecedented. The major focus and the role of teacher learner and technology have been changed drastically from traditional teaching to the **virtual learning** environment.

CURRICULUM WITHIN THE FRAMEWORK

The shift from teaching to learning instills a more engaging learning environment for teachers and learners alike This new environment encompasses a change in their respective roles. The role of the teachers will shift from knowledge sharer to facilitator, knowledge navigator to that of a partner in learning. The new role of teachers requires a new way of thinking and assimilating of the **new vision of learning process**. Learners will be far more responsible for their own learning. They usually search, find, synthesize, and share their knowledge with others on a common front.

INTRODUCTION OF NEW WAVES

The furnishing of ICT into the thought process of teaching and learning always pprefers pedagogy over technology. It is not important here to sharpen ICT skills, but rather it aims at using ICT to improve teaching and learning. The thrust area of ICT blending in training must enhance learning, motivate and push learners, promote collaboration, encourage inquiry, and exploration, and create a new learner- focused learning. It permits the shift from the reproductive model of **teaching and learning technique** to an independent, self embracing learning model. Also, it promotes creativity, capacity for initiative and critical thinking with independent research.

HOW ICT VIVIFIES SKILLS

Learners are expected to garner, select, analyze, systematize, extend, transform and present knowledge using ICT in a genuine and active learning paradigm. On the other hand, teachers are expected to introduce a new, elastic and **open learning environment** with an interactive and multimedia-based delivery system with scope for experimentation.

A NEW CULTURE IN THE MAKING

Communication and collaboration without limits make learners autonomous and more participative thereby allowing teachers to fit the whole world into classroom activities. It is here important to understand the roles of ICT and its connected**technological trends** in promoting educational make over. It uses the basic concept where ICT transforms the distribution and ownership of information resources within the scope of teaching and learning. In this manner, it further takes the relationship between educational participants to an altogether different level.

While shaping any innovative teaching and learning environment with the aid of ICT, the teacher should always keep the learning activities at the center, pedagogy should be at the core of the purpose and concentration of pedagogy-technology should be the central focus.

DIFFERENT PRACTICES IN THE MAKING

ICT must be carrying the aim to improve teaching and learning. It is the basis to pedagogy-**technology integration**. But the combination of two can be a complex one.

In this context, we can consider a scenario of a young teacher who has just introduced the use of ICT for his day to day classroom activities of teaching and learning

1. **Lesson plans** — To begin with, they need to prepare lesson plans and collect lesson materials for the classroom lecture. When we prepare such materials, one has to drafting phase. Also, they must consider then next phases of preparation namely- editing, revising and finally publishing the lesson plans and course contents.
2. **Word processor** — It can be of immense help to accomplish this task in a professional and productive manner. It will help one avoid repetition, and keep close watch on the quality of the course materials.
3. **Performance lists** — The teachers also need to prepare lists of the names of the students for observing and recording their **academic performance** and to analyze and create a statistical analysis to take some rectifying measure if any, in the lesson plan and the delivery of instruction.
4. **Spreadsheets** — It can be of immense help for creating class lists, recording their performance and performing statistical analysis upon them. While delivering the lectures to students, an innovative teacher should draw diagrams, animate some objects to explain critical concepts, take the help of pictures, even playback a video clipping of real-time operation.

All these **multimedia applications** can bring out very productive, interesting, motivating and interactive delivery of classroom instruction. Presentation software in ICT like powerpoint can be a good choice for teachers for performing such tasks.

BROADEN TEACHING LEARNING PRACTICES

On a wider plane, ICT tools help to create opportunities for learning by enabling four major processes in transforming teaching and learning to an altogether new plane. They are as follows:

1. **Secure ideas and information** from different sources through searching, locating and authenticating material in a wide range of multimedia forms;
2. **Enhance ideas and information** through processing, analyzing, publishing material via different multimedia forms;
3. **Change ideas and information** into new or different forms through synthesizing, modeling, simulating and creating material in many multimedia styles and formats;
4. **Platform for sharing ideas and information** across local, national and international networks by securing interaction electronically with others in real or delayed time.
5. **Access, extend, transform and share** are important processes by which students learn and become independent learners and self-starters.

HOW THE WORLD REACTS TO ICT AND EDUCATION

Higher education is also slowly shifting to the digital era. Online certifications and value-added certifications are securing popularity among the college-going students. Most of such courses aim at improving the ratio of the employability of the students. Therefore, there are a few **latest trends in informationand communication technology** which are as follows:

Mobile Learning — Mobile smartphones with internet have become an indispensable tool due to the introduction of new advancement in both software and hardware. In the **telecommunication industry**, the cell phone with fixed-line technology known as leapfrog. It suggests that mobile devices with computing capabilities and internet access can step ahead from the personal computers in terms of the information appliance of choices within the classroom.

Cloud computing — There is a wide range of applications that stand alone. It includes desktop computers or server farms that could be accessed through the internet. The reaction to andapplication of this trend in the present education system is so huge that makes the information appliances cheaper and easily available. It does not needthe size of the PC or the processing power. They will provide an all pervasive connectivity to the accessibility of knowledge within a **cloud technology**.

One-to-One computing — This is the most widely used and a quite**recenteducational trend** inside the classroom. It will provide an information appliance to each and every learner present along with creating learning environment. Further, it helps in imagining universal access to the technologies at hand. Classrooms must prepare for ready availability at universal level. It must be based on the theme of personal learning devices through hardware involvement. For example, it includes laptop per child (OLPC), a smartphone, a net computer and re-emergence of the tablet after a small spell of slumber.

Learning at Universal scope — The emergence of a stout connectivity infrastructure helps in the development of ICT enabled learning ability across the globe. The **universal streamlined design in education** provides various learning opportunities to students anywhere and at any time. One just requires tutorials of traditional lessons. In addition, the internet connectivity and hardware accessibility of virtual teachers and mentors provide the opportunities for self-paced, peer-to-peer and deeper learning.

Trend of Educative Gaming — The massive multiplayer and online**game experience** is common attraction for the young generation. It offers various opportunities to enhance social interactions and societal engagement by making use of games. This unprecedented success helps the students to engage inactive participation by structuring interaction and incentives. For this purpose, they use educational methods in vogue that are not falling short. The educational games effectively catch the attention and interest of the learners.

Learning at Personal level — As time has evolved, the educational systems are regularly verifying the use of technologies. The aim is to assess the knowledge of the student and enhancing their teaching techniques prior to their learning. It helps in covering both the learning styles and lacunas. This will further help in **transformation of teaching** by adjusting a pedagogy and content based on the needs of an individual. It must be attuned with their weakness and strength.

RESTRUCTURING CLASSROOM

The classroom comprises 40 chairs in rows of 5. It reflects the advancement of the industrial

age. It is due to the re-thinking of accurate learning environment that helps in focusing on the interdisciplinary, collaborative and **student-centered learning**. Ideas like round tables, light, colors and individual spaces for both teachers and students recreate the learning spaces for project-based learning. It helps in increasing its emphasis.

STRUCTURED CLASSROOMS

The school systems are providing more power to the networks and the teachers in order to identify and introduceeffective learning resources in the classroom. A majority of the online texts allow editing and addition to the teachers and transform the material for their own purposes. It also provides a feasibility to the students to receive the readymade and edited copy that could suit the speed and style of the course.

ASSESSING SMART PORTFOLIOS

The management, collection, retrieving and sorting of datainclining towards learning could help the teachers to imbibe the customized content. It also includes gaps in learning, and pedagogical approaches. The methods of **smartportfolio assessments** are seeing a transition towards formative assessments. It allows the real-time data to put emphasis on exams as the mark of excellence.

These tools are readily available far and wide so that the students can gather their work. They can use the form of online portfolio. Whenever they add the tweet, and photo to an online service, it is bound to directly appear in the personal portfolio which is accessible to teachers and peers.

TRANSFORMING TEACHER'S ROLE

In the classroom teaching, the role of the teachers is transformed in terms of knowledge to an instructional manager. It will help in providing a direction to the students through the individual learning pathways. It creates **collaborative learning** opportunities, identifies important learning resources and providesrequired support and insight to the formal and official class time.

CONCLUSION

In conclusion, there is an immense need to create world level content marked for student learning across different sections. They should be available to each and every student at just the click of a button. The **interactive learning systems** will ensure the skill and learning development in tandemwith the demands of today's world. Also, it includes a proliferation of different access devices and evolvement of **telecom infrastructure.** It can be helpful in fulfilling the knowledge gap among the students.

These trends will continue to challenge the delivery models important for formal education and are practiced in most of the countries.

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DIGITAILZATION OF TEACHING MATERIAL TO PROMOTE QUALITY

*Ms. Neha**

Education is a basic need for every human being and digital education is the current trend and necessity for every students or learners to be more focused in their learning. Digital education helps students or learners to gather knowledge in easier and different ways than before. It also reduces the learning time. In traditional education system we were mostly dependent on text book or in instructor's speech. But nowadays it is easier to find any text book or any other learning materials by using digital educational tools. Another charismatic change that transformed human life is social networking. In terms of digital education social networks contribute a good portion of education. Among social networking services, Facebook has become most popular for communication with familiar and unfamiliar persons. The impact of the use of Facebook on studentsis very impactful. In this paper authors conducted a survey on various students for understanding the digitalization effect on educational purpose. Machine learning was applied for classified the happy and unhappy student with digitalization where focused time spent on educational purposes. Finally authors provided an analytical summary of digitalization effect on education based on their survey.

***Keywords**: Digitalization, E-learning, Machine learning, Social networking.*

INTRODUCTION

Teaching is one of the main components in educational planning which is a key factor in conducting educational plans. Despite the importance of good teaching, the outcomes are far from ideal. The present qualitative study aimed to investigate effective teaching in higher education.

Given the education quality, attention to students' education as a main product that is expected from education quality system is of much greater demand in comparison to the past. There has always been emphasis on equal attention to research and teaching quality and establishing a bond between these two before making any decision; however, studies show that the already given attention to research in universities does not meet the educational quality requirements.

Attention to this task in higher education is considered as a major one, so in their instruction, educators must pay attention to learners and learning approach; along with these two factors, the educators should move forward to attain new teaching approaches. In the traditional system, instruction was teacher-centered and the students' needs and interests were not considered. This is when

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students' instruction must change into a method in which their needs are considered and as a result of the mentioned method active behavior change occurs in them. Moreover, a large number of graduated students especially bachelor holders do not feel ready enough to work in their related fields.

Teachers participating in this study believed that teaching and learning in higher education is a shared process, with responsibilities on both student and teacher to contribute to their success. Within this shared process, higher education must engage the students in questioning their preconceived ideas and their models of how the world works, so that they can reach a higher level of understanding. But students are not always equipped with this challenge, nor are all of them driven by a desire to understand and apply knowledge, but all too often aspire merely to survive the course, or to learn only procedurally in order to get the highest possible marks before rapidly moving on to the next subject. The best teaching helps the students to question their preconceptions, and motivates them to learn, by putting them in a situation in which their existing model does not work and in which they come to see themselves as authors of answers, as agents of responsibility for change. That means, the students need to be faced with problems which they think are important. Also, they believed that most of the developed countries are attempting to use new teaching methods, such as student-centered active methods, problem-based and project-based approaches in education.

Some barriers to effective teaching that are mentioned below:

- The requirements defined curriculum and resources in the teaching, the large number of students in classes, and High volume theoretical principles.
- Do not take a problem-based learning and student-centered learning in their evaluation as a bonus for teachers.
- Do not use educational assistants.
- Lack of interest and motivation among students

Having a successful and effective teaching that creates long-term learning on the part of the students will require certain feelings and attitudes of the teachers. These attitudes and emotions strongly influence their behavior and teaching. In this section, the attitudes of successful teachers are discussed.

- Alignment with organizational strategies
- Interested in students and trust in their ability
- Systemic approach in higher education
- Being interested in the scientific field of study

Requirements related to the behaviour and performance of faculty members in effective teaching

Teachers have to focus on mental differences, interest, and sense of belonging, emotional stability, practical experience and scientific level of students in training. Class curriculum planning includes preparation, effective transition of content, and the use of learning and evaluating teaching. Given the current study subjects' ideas, the following functional requirements for successful teaching in higher education can be proposed.

- Having a course plan, using appropriate educational strategies.

- Using conceptual map and pre-organizing plan in training.
- Encouraging creativity during teaching the lessons
- Explaining and developing knowledge on how to resolve the issues in future career through class discussion.
- Documentingexperiences

Developing a satisfactory interaction with students

To connect with students and impact their lives personally and professionally, teachers must be student-centered and demonstrate respect for their background, ideologies, beliefs, and learning styles. The best instructors use differentiated instruction, display cultural sensitivity, accentuate open communication, offer positive feedback on the students' academic performance ,and foster student growth by allowing them to resubmit assignments prior to assigning a grade.

Steps being taken to improve access to education

1 There are schemes like SSA (SarvaSikshaAbhiyan) that keep a tab on enrolments and drop outs.
2 Govt. has been providing midday meals under the same SSA scheme, this is made available in all govt primary schools and providing mid-day meals makes it lucrative for low income group to send kids to school.
3 Options like NIOS (National Institute of Open Schooling) also help the drop outs or home schoolers main stream.

Apart from above there aren't any other major outreach programs that make education accessible.

FURTHE RIMPROVEMENTS NEEDED

1. Government needs to walk hand in hand with technology (in education) and make schooling more flexible so that 100% kids get access to basic education.
2. 200% focus is required on quality of teachers and their training so as to make them partners in mission of making education more accessible to all.
3. Special outreach programs must be in place with more focused approach.

The key e-Learning Projects being run by the Ministry of Human Resource Development (MHRD) are as follows:

- **ICT in Education Curricula for School system:** ICT in Education Curricula for students, teachers and teacher educators has been developed at the national level and being implemented across the country. 805 MRPs/ KRPs of thirty six States/UTs were oriented on ICT curriculum for students and teachers and their roll out in respective states. Guidelines for teacher, student and schools on cyber safety and security have been published.
- **e-pathshala:** e-pathshala has been developed by NCERT (National Council for Educational Research and Training) for showcasing and disseminating all educational e-resources including textbooks, audio, video, periodicals and a variety of other print and non-print materials. So far, 3444 audios and videos, 698 e-books (e-pubs) and 504 flip books have been made available on the portal and mobile app.
- **Shagun portal:** A web portal called ShaGun (from the words Shaala and Gunvatta)

which has two parts, one of which is a Repository of good practices, photographs, videos, studies, newspaper articles etc on school education, State /UT wise has been developed which is in public domain. Its purpose is to showcase success stories and also to provide a platform for all stakeholders to learn from each other. This also instills a positive competitive spirit among all the States and UTs.

- **National Repository of Open Educational Resources (NROER):** The National Repository of Open Educational Resources (NROER) is an initiative to bring together all digital and digitisable resources across all stages of school education and teacher education. So far, 13635 files including 401 collections, 2722 documents, 565 interactive, 1664 audios, 2581 images and 6105 videos have been made available over the portal. State/ UTs are motivated to contribute resources on NROER and create OERs for their own State/ UT.
- **SWAYAM:** The 'Study Webs of Active Learning for Young Aspiring Minds' (SWAYAM) an integrated platform for online courses, using Information and Communication Technology (ICT) and covering school (9^{th} to 12^{th}) to Post Graduate Level. SWAYAM provides one integrated platform and portal for online courses, using information and communication technology (ICT) and covering all higher education subjects and skill sector courses to ensure that the every student in the country has access to the best quality higher education at affordable cost. It also offers online courses for students, teachers and teacher educators. It may be accessed on swayam.gov.in. Besides, National Institute of Open Schooling (NIOS) is promoting education through e-learning methods by providing courses on Massive Open Online Courses (MOOCs) on the portal. There are 44 courses of NIOS offered on SWAYAM platform – 14 at secondary level, 16 at senior secondary level, 4 vocational courses and 10 courses of Diploma in Elementary Education (D.El.Ed.).
- **SWAYAM PRABHA:** A programme for utilization of satellite communication technologies for transmission of educational e-contents through 32 National Channels i.e. SWAYAM PRABHA DTH-TV has been launched. CIET-NCERT is the national coordinator for one DTH TV channel i.e., Kishore Manch (#31) and has started feeding a 24x7 educational TV channel w.e.f. 09.07.2018.

Everyday four hour fresh slot is telecast and repeated 5 more times in 24 hours to provide learning opportunities for the stake holders, as per their convenience. Besides, NIOS is running 5 channels for teachers, for secondary and senior secondary levels and for sign language.

- **National Digital Library (NDL):** The National Digital Library of India (NDL) is a project to develop a framework of virtual repository of learning resources with a single-window search facility. There are more than 153 Lakh digital books available through the NDL. It may be accessed on ndl.gov.in.

CONCLUSION

In the present study, it was illustrated that a good teaching method helps the students to question their preconceptions, and motivates them to learn, by putting them in a situation in which they come to see themselves as the authors of answers, as the agents of responsibility for change. But training through this method has some barriers and requirements. To have an effective teaching; the faculty members of the universities should be awarded of these barriers and requirements as a way to improve teaching quality. The nationally and locally recognized professors are good leaders in providing ideas, insight, and the best strategies to educators who are passionate for effective teaching in the higher education. Finally, it is supposed that there is an important role for nationally and locally recognized professors in higher education to become more involved in the regulation of teaching rules.

Effective teaching also requires structural changes that can only be brought about by academic leaders. These changes include hiring practices reward structures that recognize the importance of teaching expertise, quality assurance approaches that measure learning processes, outcomes in a much more sophisticated way than routine methods, and changing the way of attaining university accreditation.

The nationally and locally recognized professors are good leaders in providing ideas, insight, and the best strategies to educators who are passionate for effective teaching in the higher education. Finally, it is supposed that there is an important role for nationally and locally recognized professors in higher education to become more involved in the regulation of teaching rules. This will help other university teachers to be familiar with effective teaching and learning procedures. Therefore, curriculum planners and faculty members can improve their teaching methods.

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6

ICT INITIATIVES FOR RURAL EDUCATION

*Sakshi Sharma**

ICT is universally acknowledged as an important catalyst for social and cultural transformation. It also acts as a harbinger in the national progress and development of the economy. However, disparities among forward and technologically backward sections of the society act as a stumbling block in achieving the goal of transforming India into a Digital India. ICT enabled education in rural areas can be an innovative option to bridge the literacy gap and upgrade the teaching learning process in rural schools and utilize the latent talent hidden in the economically backward areas. This paper presents a brief review of various schemes and initiatives taken to implement ICT in rural schools. Along with this, it also highlights the challenges and issues faced by the rural educationist in transforming traditional classroom into ICT enabled classrooms. Considering the prominent role played by ICT in imparting learning and positive impact it has on student participation and contribution in comprehensive and complete evaluation, there is dire need to do away with hurdles in implementing technology in backward areas. Information Communication & Technology has the potential to innovate, accelerate, enrich and deepen skills, motivate and engage students related school experience to work practices that strengthen teaching. However, this calls for bringing out some changes which pave the way smoothly implementing technology in rural areas. Development of quality E-content, involving beneficiaries in the process, network access to remote corners, user centred design process are some of the pre-requisites for creating ICT enabled culture in rural schools. Combining ICT in rural development will not only speed up the process of economic growth of the nation but also build a future in which each and every child can be aware of his rights and contribute in building a nation which is free from any kind of differences or disparities. To recapitulate, Information and communication technology is not only required to transform the classroom environment and teaching-learning process but is also needed to bring cultural and social transformation in the technologically backward areas.

Keywords: *ICT enabled learning, regional disparities, social transformation, initiatives*

INTRODUCTION

Information and Communication Technology refers to all those techniques and methods which help in transformation of conventional classroom into smart classrooms. It includes use of digital media in imparting learning in the classroom environment. The role played by ICT is imperative not only in higher education but also in primary and secondary education setting. Moreover, the dream of Digital India can only be achieved if children of today learn and use latest technology and transfer

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it to older generations. However, the point here worth mentioning is that all the regional disparities should be removed and schemes under ICT initiative should be implemented in urban as well as rural areas.

DEFINITION AND MEANING

The term Information and Communication Technology in education implies all those processes and methodology which enhance the teaching learning process, aid the students and increase their contribution in comprehensive and complete evaluation process.

OBJECTIVES OF THE PAPER

1. To bring out various initiatives taken by Government of India to implement ICT programmes in remote and rural schools of the nation.
2. To highlight the importance of inculcating ICT in Teaching Learning process in rural areas.
3. To shed some light on problems and challenges faced by planners and implementers in turning the plans into reality.
4. To elucidate the necessary conditions required for implementation of ICT enabled teaching in the rural schools.
5. To suggest some measures to overcome the hurdles in the process of successful implementation of ICT schemes at rural level.

NEED OF ICT IN RURAL SCHOOLS

- **Powerful tool for extending educational opportunities:** ICT is an important tool in creating better opportunities for pupils. It enables the teachers in creating an environment for students in which they not only participate enthusiastically but also improve their performance.
- **Asynchronous learning delivery and reception:** ICT enables students in actively participating in delivery of lecture rather than being a passive listener. It creates synchronization in delivery of the lecture and it's reception by the learners.
- **Access to remote learning resources:** ICT creates vast opportunities for tutors to access the learning resources and materials which conventionally are not available in such areas. It aids in creating a better understanding of concepts for the learners. Not only this, it also makes the task of teachers easy as they can teach in more novel and creative ways.
- **Paves way for Digitalisation:** Young learners of today are tomorrows working brigade. If they are technology savvy then only we can imagine a cashless society and a digital India. Moreover, knowledge gained in school is transferred to parents and guardians thatleads in development of the overall area.

CHALLENGES AND ISSUES IN IMPLEMENTATION OF SCHEMES

- **Deployment of necessary network infrastructure:** ICT initiatives call for full support from all the areas who are to be benefitted with the efforts of various organisations and policy makers. Any kind of loophole at any level may hinder the process and make it difficult for the implementers to turn ideas into reality.
- **Familiarization of end users with ICT:** The end users of ICT not only include the pupils who are to learn the content with new methods but also the tutors who are to work upon enhancing their teaching learning techniques with help of technology. ICT cannot work in an

environment where teachers are not aware about use of technology.

- **Cultural Barriers:** School authorities might face resistance from guardians in imbibing technology in curriculum of children. Many factors may make parents insecure about the usage of technology in school and routine life of their wards.
- **Costs involved in using and implementing automation:** ICT needs a total transformation in processes as well as mind set of inhabitants and users. It demands a lot of expenditure on purchase of equipment and making it accessible in remote and backward areas.
- **Inability to build various kind of local partnership:** Organisations working at national level find it difficult to make tie ups with local and rural bodies though it is necessary in smooth implementation of technology in schools and integrating it in teaching learning process.

PRE- REQUISITES FOR IMPLEMENTING ICT AT SCHOOLS

- **Teacher Training:** One of the major requisite for implementation of ICT at schools is training of the teachers. Almost all the schemes plan to achieve their set targets by appointing facilitators and guides who could help the teachers and assist them in learning all ICT based methods of delivering the lecture.
- **Power Supply:** All ICT Techniques demand a continuous supply of power in schools 24*7. Any power cuts during the lecture could mean loss of attention by the pupils and create problem for the teacher to manage the situation.
- **Connectivity:** Many ICT based methods also require internet connectivity which is a difficult task in rural and remote areas. BSNL has taken the initiative of providing internet connections at reasonable rates in remote and backward regions.
- **Development of E-Content:** There is a need to create E-resources and content which supports the use of smart boards, M-Learning and other techniques in the classroom setting.
- **Monitoring and Evaluation:** Constant monitoring and evaluation is required on the part of government as well as school authorities. So that any deviations can be rectified timely and corrective actions can be taken.

MAJOR INFORMATION AND COMMUNICATION TECHNOLOGY INITIATIVES

ICT at schools initiative of Government of India is an umbrella term which includes all other schemes and initiatives being taken to realise the dream of making Indian schools technology savvy. Following are mentioned some of the initiatives taken by many government and non-government organisations specifically for rural schools.

1. CLASS (Computer Literacy and Studies in Schools): Primarily launched as a pilot project in few areas, the CLASS Initiative was adopted as a centrally sponsored scheme in the 8th Five Year Plan. Many schools covered under the project were distributed with computers and other technological equipment for implementation of ICT at schools. More than 2000 schools covered under the project were granted aid for purchase and maintenance of technological equipment in schools.

2. Learn Out of the box: LOTB Initiative of Pratham Foundation in partnership with Vodafone Telecommunications promotes the use of technology in teaching learning process inside the classroom. It stresses upon the use of ICT to make learning a fun experience for the pupils. It also provides teachers with E-resources for making lesson plans and delivering the lectures with

help of interactive methods. The basic aim of the project is to increase student participation in the learning process and also to motivate them to get involved in the evaluation process.

3. The Digital Equaliser Program: The DE program entails integration of pedagogy and training in classroom environment. This calls for well thought out content development. A coordinator is to be appointed for a group of 6 schools and assigned the task of monitoring the activities of the school and evaluating the efforts of the authorities. He is also assigned the task of training the teachers and preparing them according to the guidelines of the scheme. By 2010, nearly 800 schools were covered under this scheme and more are being added to the list.

4. DELL Connected Classroom Program: The scheme was launched in 2010 in 3 schools with the basic aim of gaining active participation of teachers as well as students in content learning through the use of technology. Following aids were provided to schools covered under this scheme:

- Laptops
- Netbooks
- Projector
- Internet Connectivity
- Furniture
- Interactive White Board

Along with these aids, a facilitator was also provided to each school to guide the teachers and solving their technology related problems.

5. Centre for Excellence Program: AIF has established Centres of Excellence in 25 government schools. For this, a separate room is allotted with minimum of 4 computers and internet connectivity for providing training to the teachers and solving their technology related problems.

6. Rural Reach Programme: Private Companies like Infosys also understand their social responsibility by launching innovative schemes like Rural Reach Programme. Basically, the scheme was launched to reach all the rural and backward areas and provide ICT enabled education in those areas. This programme has been successful in achieving its goal of bridging the gap between urban and rural areas by giving equal access and opportunities in both the areas.

7. EPathshala: EPathshala is a web portal initiated by Ministry of Human Resource Development and National Council of Educational Research. The web portal host online resources for students, teachers as well as parents. The resources are available in different languages including hindi which makes it easier for learners from rural background to easily access the resources and comprehend them without any further support. This portal has proved to be a boon for those who do not have access to schools but have an innate desire to learn gain knowledge.

8. E-Gyankosh, Gyan Darshan, Gyan Vani: Online web portals like E-Gyankosh and telecommunication portals like Gyan Darshan and Gyan Vani have a far wide reach in making it possible for the interested learners to gain knowledge and fulfil their dreams. Knowledge is imparted among students in a fun learning way which is the basic aim of ICT.

9. Mobile Class rooms through IT buses: Under the ICT scheme of Government of India, facility of mobile classrooms is also being provided in rural areas. Thus, if students cannot access the classroom teaching, classrooms will find and reach to the students. Special buses equipped with all ICT facilities try to reach schools and colonies in backward areas and spread awareness regarding education of children.

10. National Award for Teachers using ICT: Government of India has come up with an

initiative of declaring National Award for Teachers who actively participate in promotion of ICT enabled teaching.

11. Public-Private Partnership: Government of many states have tied up with many private organisations for resource mobilisation for funding ICT education in rural areas. For this, resources are needed to be allocated according to the needs of particular area. Also, there is a need for formal education of ICT and well thought out plan for its implementation.

12. Community Tele-Centres: The goal to implement ICT enabled learning cannot be achieved if participation by the community is not sorted. Therefore, Community Tele-Centres are being opened at places which are outside the vicinity of schools so that residents of those areas could also learn and use technology.

13. E-Learning Centres and Kiosks: Many E-learning centres and Kiosks are being developed in rural areas to spread awareness regarding use of ICT in schools and imparting education.

14. Bicycle-Based Connectivity: Free of Cost Bicycles are distributed to students or their parents so that they can easily access the schools and reach on time.

15. Development of IT Curriculum: Among all other major things there is also a need to transform the curriculum and make it ICT friendly. Conventional and old curriculum cannot be taught by new and radical technology.

CONCLUSION

To sum up, government and masses should come on the same platform to enable smooth functioning of the schemes conceptualized by the planners. School authorities alone cannot implement ICT enabled teaching in the classrooms till they do not source support from teachers, local masses and students. There is a need to eliminate any differences among forward and backward sections of the society so that dream of Smart and Digital India can be achieved without any hurdles.

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7

ROLE OF ICT IN QUALITY TEACHING

*Surjit Kaur**

This paper throws light on the topic ofrole of ICT in Quality Teaching. ICT enhance the quality of education through inventive techniques by expanding the students' motivation, interest and engagement by encouraging the securing of skills and by enhancing teacher preparing which will inevitably improve communication and exchange of information. With endless online resources, innovation can help improve teaching. Teachers can utilize distinctive applications or confided in online resources to enhance the traditional methods for teaching and to keep students more engaged. Virtual lesson plans, reviewing programming and online evaluations can enable teachers save a lot time.Computer-based learning is one of the modules of school communication instrument that helps students to improve their learning skills through Computer supported instruction. It bestows computer learning in students and empowers them to get a lot of information from different websites. ICT empowers students to become dynamic members in their own learning. Video Conferencing is an amazing communication tool that can possibly change the manner in which we convey information to students. It is only one of the present integrative technologies that engage students to get ready for a better future. The new ICT empowers self- paced learning through different instruments, for example, assignments, computer and so on because of this the teaching learning endeavor has become to be progressively gainful and significant

Keywords: *Role of ICTand its importance in education.*

INTRODUCTION

Information communication technologies (ICT) at present are affecting each part of human life. They are assuming salient roles in work places, business, education, and entertainment. E-learning has turned into the standard among higher education institutions. Courses in different fields are offered on the web, students can enroll for a course through web, speakers and students can share online course materials which include notes, assignments and other multimedia contents. The role of ICT integration into teaching and learning strategy through e-learning. ICT and e-leaning can enhance the nature of enhance education through inventive strategies by increasing the students motivation, interest and engagement, by encouraging the obtaining of aptitudes and by enhancing educator preparing which will eventually improve communication and exchange of information.

Information Communication Technologies are the power that has changed numerous parts of the lives. 'Information Communication Technologies (ICT) are changing the general public and the economy, so it can't be normal that education and training ought not to be influenced. Through

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numerous uses of information and communication technologies that can directly be observed don't generously change the conventional teaching habits, when innovation use is integrated in a more extensive development exertion its capability to stimulate, accompany and amplify change is enormous."ICT has turned into a basic piece of the present showing learning process. The integration of ICTs in teaching in general and teacher education is the need of the day. ((Pavela, 2015), (Sogol Talebian, 2014)

Importance of ICT in Teaching Learning Process:

The new ICT empowers self- paced learning through different instruments, for example, assignments, PC and so on because of this the teaching learning endeavor has become to be progressively gainful and significant. ICT encourages the exchange between producers and users by keeping the students updated and improving teacher's ability and capacity cultivating a live contact between the teacher and the students through email, chat session etc. This promotes active learning, sharing of ideas, discussion and also provides immediate feedback.

1. **Computer-based learning:** Computer-based learning is one of the modules of school communication instrument that helps students to improve their learning skills through Computersupported instruction. It bestows Computerlearning in students and empowers them to get a lot of information from different websites. Following two many years of introducing computers with schools, education has been revolutionized ever since then. It reduces time spent on mechanical assignments, for example, modifying, and producingdiagrams and increases the scope of searching. It helps in finding information as well as in organizing information making it less demanding to impart to other people.

2. **Internet**: Internet tool like Email, social networks, newsgroups and video transmission have connected the world more than ever. Students would now be able to convey utilizing emails and social networking groups that give knowledge based information. Distance learning, online learning is likewise empowered through the internet. Students can learn on the online and further more converse with specialists on the online. Notes, readings, tutorials, assignments can be gotten by Students from anyplace. The Internet gives real data in writings, sounds, recordings and illustrations which can be accessed to by the person. Internet learning enables students to cooperate with one another and workforce to interface with students.

3. **Video conferencing:** This is one another medium of communication wherein students can speak with different students or educators on the online. It empowers students to become dynamic members in their own learning. Video Conferencing is an amazing communication tool that can possibly change the manner in which we convey information to students. It is only one of the present integrative technologies that engage students to get ready for a better future.

4. **Classroom Learning:** With the introduction of ICT in training, classroom learning is one trait that makes learning experiential and test to students. Students can listen in to the educator or instructor, receive visual cues through PowerPoint pictures, presents or whiteboard records and take an interest effectively. This helps in immediate interaction and students have chances to make inquiries and take an interest in live discussions. This school communication programming module further advantages in building and keeping up personal and professional connections as classrooms offer more noteworthy individual contact with different students and teachers.

ADVANTAGES OF ICT IN EDUCATION

1. **Quick access to information**: Information can be accessed to in seconds by associating with the internet and surfing through Web pages.
2. **Wider scope of communication media:** With the appearance of ICT, changed methods for communication are being presented in the teaching learning process. Offline learning, online learning, mixed learning are some of the resources that can be utilized in educational institutions. Collaborative learning, individualized learning methodologies can improve the nature of group just as individual learning with the real society. This can ensure the relevance of information.
3. **Improvesengagement:** At the point when innovation is integrated into lessons, students are relied upon to be progressively interested by the subjects they are studying. Technology gives diverse chances to make learning progressively fun and agreeable as far as showing same things in new ways. For example, delivering teaching through gamification, taking students on virtual field trips and utilizing other web based learning resources. In addition, technology can energize a progressively dynamic support in the learning procedure which can be difficult to accomplish through a conventional lecture environment.
4. **Improves knowledge retention:** Students who are engaged and interested on things they are studying, are required to have a superior learning maintenance. As referenced previously, technology can help dynamic cooperation in the classroom which additionally is an essential factor for expanded knowledge retention. Diverse types of innovation can be utilized to try different things with and choose what works best for students in terms of retaining their knowledge.
5. **Students can learn useful life skills through technology:** By utilizing technology in the classroom, both teachers and students can skills essential fundamental for the 21st century. Students can gain the skills they should be effective in the future. Modern learning is tied in with collaborating with others, tackling complex issues, basic reasoning, developing diverse types of communication and leadership skills aptitudes, and improving motivation and productivity. Technologycan help develop numerous practical skills, including creating presentations, learning to differentiate reliable from unreliable sources on the Internet, maintaining proper online etiquette, and writing emails. These are vital abilities that can be developed in the classroom.
6. **Benefits for teachers:** With endless online resources, innovation can help improve teaching. Teachers can utilize distinctive applications or confided in online resources to enhance the traditional methods for teaching and to keep students more engaged. Virtual lesson plans, reviewing programming and online evaluations can enable teachers save a lot time. This significant time can be utilized for working with students who are battling. In addition, having virtual learning situations in students enhances collaboration effort and information sharing between teachers. (Savvidis, 2016)
7. **Brings Some Fun Into The Classroom:** Learning the same exact path from a similar individual consistently can truly get… exhausting. This fatigue transforms into an absence of motivation in the students. When they are able to integrate PC learning into their ordinary schedule, they turn out to be significantly more eager to learn. (n.d, n.d)
8. **Applicable Education:** In the working scene, in almost every occupation you may take, you need to realize how to work a PC. Showing this ability in children early will give them points of interest and an expectation to absorb information for when they are grown-ups. (n.d, n.d)
9. **Connecting Geographically dispersed regions:** With the progression of ICT, education does not stay limited inside four walls of the educational organizations. Studentsfrom various parts

of the world can learn together by utilizing on the web, disconnected resources. This would result in the enhancing learning experience. Such collaborative learning can bring about developing.

- different reasoning capacity in students,
- Global points of view
- Respect for varied nature of human life and cultural assimilation.
- Facilitation of learning

10. Wider learning opportunities for pupils: Application of most recent ICT in education has given numerous options to the students to select the course of their choices. Numerous Online courses are accessible for them to choose any according to their aptitude and interest. Students can assess their own advancement through various tests, prepared to utilize online tests. This can ensure satisfaction of the employment required in the job market in this way limiting the issue of unemployment. It can likewise provide more efficient and effective citizens to the society according to the changing needs.

11. Catering to the Individual differences: ICT can contribute in taking into account individual needs of the students according to their abilities and interest. Crowded classrooms have always been a test for the teacher to think about the requirements of each studentin the class.

12. Easy accessibility of updated information: Sitting at home or at any comfortable place the desired information can be accessed effectively. This causes the students to get familiar with the updated content. Teachers also can keep themselves side by side of the most recent teaching learning techniques and related advancements.

13. Encourages individual learning: Nobody learns similarly in light of various learning styles and diverse capacities. Innovation gives incredible chances to making learning progressively effective for everybody with various necessities. For instance, Students can learn at their very own speed, review difficult ideas or avoid ahead in the event that they have to. Technology can give more chances to struggling or disabled students. Access to the Internet gives students access to an expansive scope of resources to conduct research in various ways, which thusly can increase the engagement.

14. Encourages collaboration: Students can rehearse collaboration skills by getting engaged with various online exercises.For example, working on different projects by collaborating with others on forums or by sharing records on their virtual learning conditions. Technology can support collaboration effort with students in a similar classroom, same school and even with different classrooms around the globe.

CONCLUSION

Information Communication Technologies are the power that has changed numerous parts of the lives. They are assuming salient roles in work places, business, education, and entertainment. With the appearance of ICT, changed methods for communication are being presented in the teaching learning process. Offline learning, online learning, mixed learning are some of the resources that can be utilized in educational institutions.

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8

NATIONAL PROGRAMS FOR ICT ENHANCED LEARNING AND TEACHING

*Major Mohamad**

This study examines National Programs regarding use of ICT in teaching and learning. In the current Information Age, many countries relate to education as an important factor for national growth. Teacher's education plays a significant role in coping with the challenge of educating a new generation of students to compete in a technology-driven society. Government initiated the National Program for transforming teacher and student education to meet the demands of the 21st century.

Keywords: *National Mission on Education through ICT, National Policy on ICT in School Education, Rashtriya Madhyamik Shiksha Abhiyan (RMSA), Central Institute of Educational Technology (CIET), E-Pathshala, Online Labs, e-PG Pathshala, SAKSHAT, NPTEL, SWAYAM.*

INTRODUCTION

Information and Communication Technologies are defined as all devices, tools, content, resources, forums, and services, digital and those that can be converted into or delivered through digital forms, which can be deployed for realizing the goals of teaching learning, enhancing access to and reach of resources, building of capacities, as well as management of the educational system.

These will not only include hardware devices connected to computers, and software applications, but also interactive digital content, internet and other satellite communication devices, radio and television services, web based content repositories, interactive forums, learning management systems, and management information systems.

These will also include processes for digitization, deployment and management of content, development and deployment of platforms and processes for capacity development, and creation of forums for interaction and exchange.

National Programs and Schemes for use of ICT in Teaching and Learning:

National Mission on Education through ICT

The National Mission on Education through Information and Communication Technology (NME-ICT) is envisaged as a Centrally Sponsored Scheme to leverage the potential of ICT, in teaching and learning process for the benefit of all the learners in Higher Education Institutions at any time any where mode. Its motto being "to provide connectivity up to the last mile", the NME-ICT aims to

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extend computer infrastructure and connectivity to all Colleges existing at present and each of the departments of existing Universities/Deemed Universities and institutions of national importance in the country. The numbers of Institutions/Departments are is grow in future.

NME-ICT seeks to bridge the digital divide, i.e., the gap in the skills to use computing devices for the purpose of teaching and learning among urban and rural teachers/learners in higher education domain and empower those, who have hitherto remained untouched by the digital revolution and have not been able to join the mainstream of the knowledge economy. This will enable them to make best use of ICT framework for teaching and learning.

NME-ICT is focused primarily on development of high quality e-content in all disciplines and subjects at various levels. The projects under NME-ICT can broadly be classified as:

(a) e-Content Development (b) Infrastructure Development (c) Social Impact

National Policy on ICT in School Education (MHRD)

The National Policy on Education 1986, as modified in 1992, stressed the need to employ educational technology to improve the quality of education. The policy statement led to two major centrally sponsored schemes, namely, Educational Technology (ET) and Computer Literacy and Studies in Schools (CLASS) paving the way for a more comprehensive centrally sponsored scheme– Information and Communication Technology @ Schools in 2004. Educational technology also found a significant place in another scheme on upgradation of science education. The significant role ICT can play in school education has also been highlighted in the National Curriculum Framework 2005 (NCF) 2005.

Use of ICT for quality improvement also figures in Government of India's flagship programme on education, Sarva Shiksha Abhiyan (SSA). Again, ICT has figured comprehensively in the norm of schooling recommended by the Central Advisory Board of Education (CABE), in its report on Universal Secondary Education, in 2005. With the convergence of technologies, it has become imperative to take a comprehensive look at all possible information and communication technologies for improving school education in the country. The comprehensive choice of ICT for holistic development of education can be built only on a sound policy. The initiative of ICT Policy in School Education is inspired by the tremendous potential of ICT for enhancing outreach and improving quality of education. This policy endeavors to provide guidelines to assist the States in optimizing the use of ICT in school education within a national policy framework.

Vision

The ICT Policy in School Education aims at preparing youth to participate creatively in the establishment, sustenance and growth of a knowledge society leading to all round socioeconomic development of the nation and global competitiveness.

Mission

To devise, catalyze, support and sustain ICT and ICT enabled activities and processes in order to improve access, quality and efficiency in the school system

Rashtriya Madhyamik Shiksha Abhiyan (RMSA)

The Information and Communication Technology (ICT) in schools have been subsumed in the Rashtriya Madhyamik Shiksha Abhiyan (RMSA). Now ICT in Schools is a component of the RMSA.

The Information and Communication Technology (ICT) in Schools was launched in December, 2004 and revised in 2010 to provide opportunities to secondary stage students to mainly build their capacity on ICT skills and make them learn through computer aided learning process. The Scheme is a major catalyst to bridge the digital divide amongst students of various socio economic and other geographical barriers. The Scheme provides support to States/UTs to establish computer labs on sustainable basis.

The scheme has essentially four components:-

The first one is the partnership with State Government and Union Territories Administrations for providing computer aided education to Secondary and Higher Secondary Government and Government aided schools.

The second is the establishment of smart schools, which shall be technology demonstrators.

The third component is teacher related interventions, such as provision for engagement of an exclusive teacher, capacity enhancement of all teachers in ICT and a scheme for national ICT award as a means of motivation.

Fourth one relates to the development of a e-content, mainly through Central Institute of Education Technologies (CIET), six State Institutes of Education Technologies (SIETs) and 5 Regional Institutes of Education (RIEs), as also through outsourcing.

Central Institute of Educational Technology (CIET)

Vision of CIET is to be the national pioneer and leader in various aspects of the professional improvement and advancement in educational communication and technology, grounded in theory, in research, in practice and in code of ethics, providing solutions by utilizing the innovations, research combined with design, building and managing the resource centre of quality educational media software and integration of technology and pedagogy.

The mission of Central Institute of Educational Technology (CIET) is to:

- Act as a nodal resource centre for school education media software acquired through national, regional and international sources for reference and research.
- Achieve excellence in design, research and production of educational software for children and teachers, including parents.
- Contribute to teacher education through the convergence of appropriate technologies.
- Build capacities of teachers/educators for quality improvement roles in school education.
- Constructively inform educational policy makers and to critically appraise educational technology (ICT related) policy in India.

Digital India: E-Pathshala

Developed by NCERT, e-Pathshala showcases and disseminates all educational e-resources including textbooks, audio, video, periodicals and a variety of other print and non-print materials through website and mobile app. The platform addresses the dual challenge of reaching out to a diverse clientele and bridging the digital divide (geographical, socio-cultural and linguistic), offering comparable quality of e-contents. All the concerned stakeholders such as students, teachers, educators and parents can access e-books through multiple technology platforms i.e. mobile phones (android, iOS and Windows platforms), and tablets (as e-pub) and on web through laptops and desktops (as flipbooks).

Digital India: Online Labs

Online Labs (OLabs) for school lab experiments provides students with the ease and convenience of conducting experiments over the internet. It has been developed to supplement the traditional physical labs and bridge the constraints of time and geographical distances. This not only reduces the costs incurred for conducting experiments in real time but gives a student the flexibility to explore and repeat experiments till they are thorough.

e-PG Pathshala

The MHRD, under its National Mission on Education through ICT, has Sanction Grant in Aid to UGC for production of e-content in 77 subjects at postgraduate level. The content and its quality being the key component of education system, it is proposed to create high quality, curriculum-based, interactive content in different subject across all disciplines of social sciences, arts, fine arts & humanities, natural & mathematical sciences and linguistics and languages. E-content, so developed would be available in open access through a dedicated Learning Management System as well as through Sakshat Portal.

Sakshat

The proposed mission work for scaling up of the existing Education Help line - 'One Stop Education Portal'- "SAKSHAT'. The helpline shall take care of all the needs of the entire learning community including the students enrolled in various educational institutions and lifelong learners by extensively utilizing e-learning concepts and the ICT based methodology. "SAKSHAT" shall be fully equipped with intelligent navigation techniques for easy and smooth browsing. The education portal shall integrate the scholarship programme of the Ministry of Human Resource Development and ensure disbursement of Scholarship electronically. In order to achieve its objective, the proposed Mission shall encourage development of high quality e-content, for loading on to 'SAKSHAT' in all disciplines and subjects, at various levels using the best available authoring tools and making fullest use of animation and multimedia technologies in order to make learning interesting and facilitate clarity of concepts to the learners.

National Programme on Technology Enhanced Learning (NPTEL)

The National Programme on Technology Enhanced Learning (NPTEL) was initiated by seven Indian Institutes of Technology (Bombay, Delhi, Kanpur, Kharagpur, Madras, Guwahati and Roorkee) along with the Indian Institute of Science, Bangalore in 2003. Five core disciplines were identified, namely, civil engineering, computer science and engineering, electrical engineering, electronics and communication engineering and mechanical engineering and 235 courses in web/video format were developed in this phase.

The main goal of NPTEL Phase II (2009-14) was to build on the engineering and core science courses launched previously in NPTEL Phase I. An additional 600 web and video courses were created in all major branches of engineering, physical sciences at the undergraduate and postgraduate levels and management courses at the postgraduate level. Several improvements such as indexing of all video and web courses and keyword search were implemented.

Some highlights:

Largest online repository in the world of courses in engineering, basic sciences and selected

humanities and social sciences subjects

Online web portal http://nptel.ac.in – more than 471 million+ views

Youtube channel for NPTEL – most subscribed educational channel, 1.5 million+ channel subscribers, 404 million+ views

More than 56000 hours of video content

Most accessed library of peer-reviewed educational content in the world

52000+ hours of transcribed content; 51000+ hours of subtitled videos

Swayam

SWAYAM is a programme initiated by Government of India and designed to achieve the three cardinal principles of Education Policy viz., access, equity and quality. The objective of this effort is to take the best teaching learning resources to all, including the most disadvantaged. SWAYAM seeks to bridge the digital divide for students who have hitherto remained untouched by the digital revolution and have not been able to join the mainstream of the knowledge economy.

This is done through a platform that facilitates hosting of all the courses, taught in classrooms from Class 9 till post-graduation to be accessed by anyone, anywhere at any time. All the courses are interactive, prepared by the best teachers in the country and are available, free of cost to any learner. More than 1,000 specially chosen faculty and teachers from across the country have participated in preparing these courses.

The courses hosted on SWAYAM are in 4 quadrants – (1) video lecture, (2) specially prepared reading material that can be downloaded/printed (3) self-assessment tests through tests and quizzes and (4) an online discussion forum for clearing the doubts. Steps have been taken to enrich the learning experience by using audio-video and multi-media and state of the art pedagogy / technology.

In order to ensure that best quality content is produced and delivered, nine National Coordinators have been appointed. They are:

AICTE (All India Council for Technical Education) for self-paced and international courses

NPTEL (National Programme on Technology Enhanced Learning) for Engineering

UGC (University Grants Commission) for non technical post-graduation education

CEC (Consortium for Educational Communication) for under-graduate education

NCERT (National Council of Educational Research and Training) for school education

NIOS (National Institute of Open Schooling) for school education

IGNOU (Indira Gandhi National Open University) for out-of-school students

IIMB (Indian Institute of Management, Bangalore) for management studies

NITTTR (National Institute of Technical Teachers Training and Research) for Teacher Training programme

Courses delivered through SWAYAM are available free of cost to the learners, however learners wanting a SWAYAM certificate should register for the final proctored exams that come at a fee and attend in-person at designated centres on specified dates. Eligibility for the certificate will be announced on the course page and learners will get certificates only if these criteria are matched. Universities /colleges approving credit transfer for these courses can use the marks/certificate obtained in these courses for the same.

CONCLUSION

We can use technology's power to improve learning and teaching. Continued and sustained efforts at educational reforms, coupled with increasingly effective use of ICT's can harness the potential of technology for the benefit of future generations and a better tomorrow.

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9

ROLE OF ICT IN BIOSCIENCES AND BIOINFORMATICS

*Anu**

The information technology has been making remarkable changes in every aspect of life and its importance cannot be underestimated. Biosciences are not an exception in the profit from information technology. This article explains the importance of information technology in biological sciences. IT makes a great revolution in the teaching and learning processes, leads to remarkable improvement in biological simulations and modeling. The best tools from information and communication technologies (ICTs) have produced and developed for the various studies in different fields of life sciences using bioinformatics. It has become possible to manage vast amount of data from research with the help of IT in the form of different databases and anybody can retrieve this data from any region of the world.

Keywords: *ICT, Bioinformatics, computational biology*

INTRODUCTION

Information technology has been used in biosciences for a long time but the biosciences were initially relatively modest users of IT. In a survey by National Academy of Sciences in 1966-67found that a lower percentage of life scientists use computing tools as compared to others. (National Academy of Sciences, 1970). In recent years, the use of IT in biological sciences has increased. The growth in importance of information technology can be exemplified by the growth of several new interdisciplinary subfields of biology. 1) First one is Bioinformatics which is defined by the application of computers, databases and computational methods for the management of biological information and its analysis. Bioinformatics has become essential for every aspect of data management in modern biology (Kaminski, 2000). 2) Another one is computational biology which uses mathematical and computational approaches to address and resolve the theoretical and experimental questions in biology. It also helps in the various other subfields such as genomics, proteomics, transcriptomics, metabolomics, pharmacogenomics and physiomics. There are systems that are too difficult to study without advanced computational tools for managing and intricating the data into models (Department of Energy, 2001). 3) System biology which aims to model and simulate various systems and visualize the results to have better understand living processes. This type of research in biological systems can be characterized as "model driven" (Yao, 2002). The rapidly growing biological information from experimental and clinical studies requires the use of mathematical and computational modeling (Mehr, 2001). For analysis of the behavior of thousands of genes at a time, computer-aided algorithms

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are required (Schilling et al, 1999 and Kao, 1999). 4) Another application of IT in biosciences is the application of artificial intelligence to biology. Scientists from the field of molecular biology and computer science have experimented with various computational methods developed in artificial intelligence including knowledge based and expert systems, artificial neural networks and other automated learning techniques (Rawlings and Fox, 1994).

BIOINFORMATICS: APPLICATION OF INFORMATION TECHNOLOGY IN BIOLOGICAL SCIENCES:

Bioinformatics is a rapidly growing discipline, which is the application of computational tools and techniques to the management and analysis of biological data (Baxevanis et al, 2007). The bioinformatics research is used to avoid time, cost and wet lab practices. The importance of sequence databases and the need to store this data was realized by the scientists during working with Human Genome Project. The vast amount of data consisted of 200 volumes of 1000 pages and reading of this would require 26 years. These problems of storing data have only become possible with bioinformatics (Takahashi et al, 2013). The uses of bioinformatics have revolutionized the research and many long term projects are turned up so fast. The bioinformatics have been able to produce best tools from ICT and have roles in various fields of biotechnology like drug designing and development, genomics, proteomics, environmental biotechnology and others (Ashraf and Kohnehrouz, 2010).

1. Organization of Information: The databases were created to store large amount of data to allow the scientific community access (Luscombe et al, 2001; Prosdocimi, 2010). The increase in the amount of data resulted in the increase in the number of biological databases, and their compilation, updating and dissemination have been carried out by the Nucleic Acid Research Journal. There are various types of information sources used by the bioinformatics: 1) Raw DNA sequences 2) protein sequence data 3) macromolecular structures 4) genome sequencing and others. The databases can also be divided into two types: primary and secondary. The primary databases are composed of results of experimental data whereas the secondary databases contain information of data based on curation processes (Prosdocimi, 2010). The primary databases are GenBank at the National Center for Biotechnology (NCBI), DNA database of Japan (DDBJ) and European Molecular Biology Laboratory (EMBL). These databases are the members of the INSDC and share the depository data daily (Prosdocimin et al, 2002). The secondary databases which are the curated ones are Protein Data Bank (PDB), Swiss-Prot, SCOP, Prosite, PIR etc. (Amaral et al, 2007).

2. Drug Discovery: The drug discovery process typically defined as the four distinct but related processes: 1) target identification/validation 2) lead identification 3) lead optimization 4) discovery and development (Shayne, 2005). Traditionally, pharmacology faced various difficulties in finding new drugs because of labor intensive wet lab experiments and testing each and every ligand on target molecules. To overcome this problem computer aided drug design (CADD) and bioinformatics provides a huge support (Schneider, 2005).Computational systems biology attempts to model or simulate intra and intercellular vents using data gathering from genomics, proteomics or metabolomics experiments (Wayne and Wishart, 2007). The pharmaceutical sector identifies molecular interventions that they predict will lead to therapies at the organism level. There are different pharmaceutically relevant computational models which are used as predictive tools (Kumar, 2006).

3. Disease Genetics and Pharmacogenetics: The goal of disease genetics is to identify

how genetic variation can influence disease susceptibility and understanding the molecular processes resulting in clinical diseases. After understanding the molecular processes responsible for the disease, these can be treated by targeting these processes. Disease markers are typed throughout the genome and using linkage analysis algorithms, chromosomal regions harboring disease genes are identified (Stoll, 2000).

4. Computational Tools in Genomics and Proteomics: The study of genes and their expression is called as Genomics and it generates a vast amount of data from gene sequences, their interrelations and functions. Bioinformatics plays a very important role in managing this data and provides both conceptual and practical methods for detecting systemic and functional behaviors of the cell and the organism (Nakagami et al, 2010). Bioinformatics also play a role in proteomics (study of protein structure, function and its interactions produced by a cell, tissue and organisms). Tools and databases of bioinformatics accumulate this enormous data and provide access to this data for researchers. Many algorithms to study proteins have been developed for eg. To study image analysis of 2D gels, peptide mass fingerprinting and peptide fragmentation fingerprinting (Ashraf and Kohnehrouz, 2013).

5. Phylogenetic Analysis: The study of evolutionary/ ancestral relationship among each and every species present is known as phylogenetics. In previous years it was very difficult to do that because every time it requires the fossils of organisms and was a quiet time consuming. But with the advent of bioinformatics, the phylogenetic tress can be constructed based on sequence alignment using various methods such as Clustal omega and other algorithm methods for construction of phylogenetic tree that are used depending on the various evolutionary lineages (Shinozaki et al, 2003).

6. Bioinformatics for Environment: The major concern all over the world is environment pollution. The pollutants from industries, transportation and other sources are progressively deteriorating human health. Bioremediation is the method to clean up the environment with the use of the microorganisms and this technology can further be improved with the help of bioinformatics. Bioinformatics provide the necessary information and data for structural characterization of protein produced by microbes to degrade the pollutants (Fulekar, 2007). To preserve the environment the biofuels can be used instead of fossil fuels which produce most of the pollutants in air. There are a number of microbes which can be employed to produce biofuels and bioinformatics is important in understanding and analysis of biofuel producing pathways. The access to multiple micro algalgenomes now provides various opportunities for the application of OMICS approaches to study the algal lipid metabolism and identify gene targets for the development of potentially engineered strains with high lipid content which can further be used as biofuel (Beer et al, 2009).

7. Crop Improvement and Agricultural Bioinformatics: Sustainable agricultural production is a major issue in response to global climate change and population increase. The integrated OMICS strategies show the molecular system of the plant which are used to improve the plant productivity, genomic strategy and especially comparative genomics helps in understanding the genes and their functions. By the use of databases new techniques can be designed to increase the crop production (Shinozaki and Yamaguchi, 2007). Bioinformatics has started showing its profound impact on agricultural research and development globally. In response to this development, Indian Council of Agricultural Research (ICAR) New Delhi has established Centre for Agricultural Bioinformatics (CABin) with a team of multi-disciplinary research professionals as a division at Indian Agricultural

Statistics Research Institute, New Delhi. The center is providing computational support to biotechnological research in agriculture. The first supercomputing hub for Indian Agriculture i.e. Advanced Supercomputing Hub for OMICS knowledge in Agriculture- ASHOKA has been set up in NABG. To provide access to this facility, National Bio-computer Portal has been launched which consist of a number of computational biology and agricultural bioinformatics software (https://iasri.icar.gov.in/division/centre-for-agricultural-bioinformatics/).

CONCLUSION

Information technology has a central role in the bioinformatics and biosciences. This review briefly describes the role and importance of bioinformatics in drug discovery, biological databases, tools used in bioinformatics and their application in phylogenetic analysis, biomarker recovery and in various researches of life sciences. The field of bioinformatics focuses on developing and applying computationally intensive tools on biological data.

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10

INITIATIVES TAKEN BY THE GOVT. OF INDIA TO PROMOTE USE OF ICT IN HIGHER EDUCATION

*Prof. Sandeep Kaur**

We are increasingly moved into a world which is highly volatile, uncertain, complex and ambiguous. In this ever changing technological environment, what is true today is not true tomorrow. So there is need to adopt an education system which should be technology driven. There has been tremendous growth in the use of ICT in teaching learning and research activities all over the world. Information and communication technology has transformed the way of interaction between the teacher and student. Use of ICT in Indian education system is growing but not at the level of the other developed countries. We all are known that skill based and quality education is the need of hour. In India there are some autonomous higher education institutions provide ICT based education but still thousands of other institutions don't have resources and infrastructure for digital teaching and learning. So the central government of India identifies the importance of ICT in education and launched the various integrated schemes for teachers, students and teacher educators at the national level. This paper focuses on the various initiates which are taken by the govt. to promote the use of ICT in higher education.

Keywords: *Information and communication technology, higher education, teaching and learning, initiates*

INTRODUCTION

The emergence of the ICT has not only changed the practices of business, governance and education but every sphere of life. An increased exposure of student to educational ICT could help them for the acquisition of knowledge based learning, practical skills and presentation skill. Several reports and studies have enlightened the potential benefits of ICT for improving the quality of education. ICT stands for "Information and Communication Technology" which include radio, television, internet wireless networks, cell phones and other communication mediums. ICT is similar to IT (information technology) but mainly emphasizes on communication technology. ICT is the technological source which provides information at the right time, right place in the right form to the right person. Thus ICT is the combination of computer applications and communications technology used for collecting, storing, processing and dissemination of information. **According to Aristotle**, "Education is the process of training man to fulfill his aim by exercising all the faculties to the fullest extent as a member of society."**According to UNESCO**, "ICT is a scientific technological and engineering discipline and management technique used in handling information and application and association with social, economical and cultural matters." From the above definitions it is clear that

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integration of ICT with education can increase the opportunities for the person and helps to build up a developed community.

RECENT TRENDS IN HIGHER EDUCATION

Indian higher education system is the third largest education system in the world. There are 935 universities in India. Out of these, 409 state universities, 127 deemed to be universities, 50 central universities and 349 are private universities as reported by UGC as on 01.02.2020. There are 39,991 colleges in country (govt. and private degree colleges). India is going to become world's largest workforce by 2027 and currently holds tag of largest young population. Therefore the demand for the higher education in India will increased exponentially in future.

BENEFITS OF ICT IN HIGHER EDUCATION

The use of ICT techniques in education has a positive influence on the students learning and teacher's teaching process. Following are some benefits of using ICT:

From student's point of view:

- Provides learner-centric approach
- Content flexibility and 24X7 delivery
- Combination of work and education is possible
- Easy access to information
- Quality education and innovative way of interaction

From teacher's point of view:

- Innovative methods of teaching
- Easy use of multimedia
- Useful in teacher development and research activities
- To attract more students

INITIATES TAKEN BY GOVERNMENT TO PROMOTE THE USE OF ICT IN HIGHER EDUCATION

Realizing the importance of information and communication technology (ICT) Department of Higher Education, Ministry of Human Resource Development (MHRD) is administered a programme 'National Mission on Education through Information and communication Technology' (NMEICT) to make quality content to available to all learners in the country free of cost. Apart from this, the various initiatives taken by government to increase ICT enabled education as follows:

SWAYAM: It is stands for 'Study Webs of Active Learning for Young Aspiring Minds'. SWAYAM is an integrated platform offering online courses for school to post graduate level. Under the 'Digital India' initiate of government of India, one of the key area is MOOCs (Massive Open Online Courses). So MHRD, Govt. of India and AICTE with the help of Microsoft developed SWAYAM. 1.02 crore students are enrolled to various courses and 2769 MOOCs have been offered till date. These online courses are being used by students, non-students and teachers for lifelong learning. Previously, the courses are available for the Indian citizens but now they are offered to anyone in the world having internet connection. Courses are offered free of cost however fees may impose if learner requires a certificate. This platform not only provides video lectures and reading material but also assignments/quizzes that could end up in securing credits after completing the

assessment system.

It may be accessed on www.swayam.gov.in.

SWAYAM PRABHA: The SWAYAM PRABHA is an initiate of MHRD to provide 32 DTH channels devoted to telecasting of high quality educational programmes on 24X7 basis. The DTH channels shall cover higher education, school education, curriculum based courses and competitive exams. The contents are provided by the UGC, NPTEL, IITs, IGNOU, NCERT and NIOS. The web portal is managed by the INFLIBNET Centre. It's main aim to make quality learning resources available to remote areas where internet connectivity is slow or not available. Its official website is www.swayamprabha.gov.in.

National Digital Library (NDL): National Digital Library of India is the project of MHRD to develop a framework of virtual repository of learning resources. This library stores different types of digital contents including books, articles, videos, audios, thesis and other kinds of learning media. NDL provide free access to many books in English and Indian languages and also provide single window facility to access contents. The official website is www.ndl,iitkgp.ac.in.

Virtual labs: Virtual labs project is a consortium activities of 12 participating institutes and IIT Delhi is coordinating institute. This project is a fully interactive simulation environment to perform experiments, collect data and answer questions to assess the understanding of knowledge acquired. There are 225 such labs with more than 1800 experiments which are benefiting more than 15 lakh students. The official website is www.vlab.co.in

E-Shodh Sindhu (eSS): MHRD has formed e-Shodh Sindu merging three consortia initiates namely UGC-INFONET Digital Library consortium, NLIST and INDEST-AICTE consortium. The main objective of this is to provide qualitative electronic resources for higher education and access to various peer reviewed journals and a number of bibliographic, citation and factual databases in disciplines. The official website is www.inflibnet.ac.in/ess.

E-Yantra: e-Yantra is sponsored by MHRD under the National Mission on Education through ICT**.** Under this project, IIT Bombay is spreading education in embedded systems and robotics. It's main aim to create the next generation of embedded systems engineers with a practical solution to some of the real world problems. The official website is www.e-yantra.org.

E-acharaya: The INFLIBNET Centre has developed a web-based portal called "e-Acharaya". The portal provides facility to search and browse the learners all learning materials through a single interface. There are e-contents available on eight subject categories agriculture science, biological science, chemical science, physical science, medical and health sciences, engineering and technology, social sciences and arts and humanities. It may be accessed on www.e-acharaya.inflibnet.ac.in/ vidya-mitra/

Spoken Tutorial: The spoken tutorial project is launched by the MHRD under the 'Talk to a Teacher' program. This project facilitate teaching and learning a particular FLOSS (Free/Libre and Open Source Software) like Linux, Scilab, LaTex, MySQL, Java, C/C++ etc. The official website is www.spoken-tutorial.org.

Global Initiative of Academic Networks (GIAN): GIYAN is the initiative of MHRD which provides participation of foreign faculty as distinguished/ adjunct/ visiting faculty/ professors of practice etc. in delivering short or semester long courses in institutes like IITs, IIMs, Central Universities, IISc Banglore. It's main aim to tap the talent pool of scientists and entrepreneurs internationally to encourage their engagement with the institutes of higher education in India. The

official website is www.gian.iitkgp.ac.in.

The National Programme on Technology Enhanced learning (NPTEL): This programme was initiated by 7 institutes of Technology and Indian institute of science, Bangalore in 2003. NPTEL provides various web and video courses in all major branches of engineering, physical sciences at the undergraduate and post-graduate levels and management courses at the post-graduate level. NPTEL makes easy to the learners to search content by indexing of all video and web courses and by keyword search. It may be accessed on www.nptel.ac.in/

Apart from above, there are some other major programs like SAKSHAT: A one stop education portal, OSCAR(Open Source Courseware Animations Repository), ShodhGangotri, Virtual Learning Environment, Text Transcription of Video Content, SOS Tools (Software and Simulation Tools) and e-PG Pathshala etc. also launched by the MHRD, Govt. of India to promote ICT enabled education.

CONCLUSION

In nut shell, Government of India has taken numerous initiatives to increase the use of ICT in higher education. But the problem lies in the proper execution and implementation of these programs at the ground level. Furthermore, there is lack of infrastructure in the backward area for instance, problem in internet connectivity and non availability of computers etc. So it is suggested to the govt. that to improve the overall education system, first of all provide adequate infrastructure and provide quality education to all learners in the country so that they able to compete at the global level. The educated youth could bring the economy of India to the number one in the world.

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11

ROLE OF E- LEARNING IN TEACHING-LEARNING PROCESS

*Neeru Bala**

This paper throws light on the topic of role of e- learning in teaching-learning process. The higher education institutions utilize modern information and communication Technologies for teaching and learning. In present situation E-Learning is one of the important part of learning process which has tremendous implication in the present education system. The feature of E-Learning that empower educational atmosphere supports people for their utilization. In addition, it empowers an instructor who shares the information to contact more students free of time and area with the utilization of E-Learningin education. We can't work in the society without online innovation. Online innovation has additionally entered the field of training. E-learning is a subset of the Distance Learning. E-learning play an essential role in the educational development of any country. It likewise offers opportunities for creating countries to improve their educational advancement. It can likewise play a basic role in setting up new generation of teachers, just as updating the aptitudes of the current training power to utilize 21st century tools and instructional methods for learning. So it is the changing pattern in training. The modern technologies especially the web made education never again restricted to the four walls of the classroom. E-learning contains all types of electronically upheld learning and teaching. This paper also discuss about the merits and demerits of E-Learning in the field of education.

Keywords: *E-Learning and its advantages.*

INTRODUCTION

E-learning has been presented as atool in the learning process in most of the international universities around the world. The term "E-learning" is characterized by as "any learning that includes utilizing web or intranet." after a year made the definition progressively summed up by demonstrating that it is "anything conveyed, empowered, or interceded by electronic innovation for explicit purpose of learning" According to "E" in E-learning ought not represent electronic; it ought to be a abbreviation for "developing, upgraded, all over, every time and everyone." actually, the quotation of shows the most of the benefits of E-learning for students and educators.E-learning is playing very important role in the present educational scenario. It has potential to change the whole education system and due to this very reason it has become one of the most preferred subjects for the researchers. Research works on e-learning are going on in various disciplines like Mass Communication, Education, Information and Technology (IT) and Distance Education. Scholars are working on the various aspects of e-learning. Information and Communication Technology has opened a new sky for the experiments on teaching-learning methods to make education more interesting, flexible and broader.

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It is a broad term including various types of teaching-learning methods based on information and communication technology. Both face-to-face (classroom based conventional method of teaching) and distance learning are using the different tools of e-learning successfully to enhance their efficiency.E-learning is the combination of technology and specially designed learning material. Learning material must be according to the medium so special design is required. (M. Samir Abou El-Seoud, 2014)

CHARACTERISTICS OF E- LEARNINGIN EDUCATION

- **E-learning Involves Learning Objects:** E-learning utilizes reusable learning objects. This RLO permits one to make E-learning course effortlessly.
- **E-learning is Personalized:** Usually E-learning framework allows its e-learning to customize the learning by tailoring its contributions to their learning style, work prerequisites, profession objectives, current information and individual inclinations.
- **Learner-Centric Learning**: The student centric e-learning model makes a variety of resources accessible to the student, who is free to choose when, where and how to learn.
- **Flexible Learning:** E-learning has truly been connected with distance education and flexible learning. In distance education, different advances can be utilized to interface students, teachers and resources that are expelled in time or space. The sign of flexible learning, as its name proposes, is its versatility to students' needs and conditions.
- **E-learning is Social:** E-learning looks to encourage coordinated effort and peers collaboration. Different E-learning advances encourage different types of collaboration among students and teachers.
- **E-learning Involves Effective Communication:** The viability of E-learning additionally relies upon building up two-path communication between teachers and students, and among students themselves. There are numerous independent apparatuses just as student management system integrated tools to cultivate intuitive and collaborative engagement.
- **Lifelong learning**: With increasing access to advancements and its regularly expanding complexity this way to deal with learning encourages deep rooted learning among different partners.

FEATURES OF E-LEARNING

In view on the special needs, capacities and backgrounds of students, E-learning is becoming increasingly popular. A portion of the primary features of E-learning are outlined below:

1. **Connectivity or networking**: The students are spread over large distances and not limited to a classroom with an educator teaching them as earlier. This innovation (PCs and broadband web) permits individuals spread over large distances to be associated and arranged and will approach both text and visuals materials. Animation is likewise entering the educational scene apart from its omnipresence in the promotion world. Additionally, in certain circumstances there are an extremely vast number of students in some cases of the order of 1,000, as occurs in open schooling or distance education programmesand this extensive number would not fit into a classroom regardless. This innovation enables every one of these students to approach the material accessible.

2. **Flexibility**: Again, as a becauseof occupations which students possibly occupied with, students have shifted long periods of learning - late nights or early mornings. E-learning can

accommodate the necessities of such students. Similarly disabled or ill students who think that its hard to go to regular classes would likewise have the capacity to profit.

3. **Interactivity and collaboration**: Not just is their connectivity between the teacher and the students, the last can likewise be interconnected to themselves for sharing information or for posting remarks, and so forth. There can likewise be collaboration between various researchers or among educators and students spread over large distances.

4. **Virtual Learning Environment:** In perspective on the exceptional needs of students and the scope this innovation offers institutions and researchers, a virtual learning condition (VLE) or virtual learning gateway (VLP) is regularly made to empower interested people or students to approach instructive material like writings, visuals, tests, and so on accessible on it. The VLEs made would obviously vary from subject to subject. For example something made by therapists or architects would vary from that made by engineers or business organizations. The VLE or VLP enables access to various kinds of students spread over distance and location. For every one of these reasons, E-learning givesalternative methods for realizing which is ending up progressively well known today. Nonetheless, one must be watchful in applying innovation in the homeroom. A few considerations arise:

- The kind of innovation to be utilized for promoting deep and durable learning instead of superficial learning.
- What academic changes are required for effective educating learning.(Bhatia, 2017)

ADVANTAGES OF E-LEARNING IN EDUCATION

1. **Helpful for students**: E-learning materials are self- placed and can be accessed whenever the student needs. They don't require the student to be physically present in a classroom. Students can likewise download and spare the taking in materials for future purposes from the framework.

2. **Lower cost**: E-learning is generally a cost- efficient method for learning for most Students as they can look over an extensive scope of courses and make the selection depending upon their necessities. It can likewise be cost- efficient for some colleges on the grounds that once the learning stages are set up, they can be reused for some sessions.

3. **Up-to-date learning materials**: The study materials in E-learning systems can be updated more often than in the classroom based education systems. When the study materials are set in the system, they can be updated without changing the entire materials and the materials can be accessible and reused for longer time.

4. **Quick Creation, up gradation and revision of course material:** In e-learning we can update study materials faster than any other mode of education. All technical supports are available to create vivid e-learning study materials.

5. **Quick access to supporting material through hyperlink:** E-learning has changed the learning process completely. Now learner is studying with many thousands of supporting books and materials.

6. **Flexible method for learning**: E-learning is aflexible method for learning for some students. A large portion of the examination materials are put away for the students to get to at whatever point they need. Students can likewise choose between a teacher drove and a self-learning system. In E-learning system it is additionally possible for students to skip over the study materials they definitely know and choose the ones they need to learn.

7. **World-wide learning society**: E-learning system help in making anworldwide learning society as anybody can get to the study materials regardless of the geological area. In the system accessible now students can likewise add to the study materials, which keeps the materials updated.

8. **Scalable E-learning systems**: The number of students in virtual classes or E-learning system can be not very many or actually high without creating any critical distinction in the total cost.

9. **Higher degree of freedom for students**: One may think that itsdifficult now and again to adapt new thoughts. E-learning system give the possibility to students to gain proficiency with a similar material over and over until they are fulfilled.

10. **Better retention**: The video and audio materials utilized in e-learning make the entire learning process progressively fun. This will assist students with remembering the things they learn for a significant lot of time. E-learning materials can likewise be gotten to at whatever point needed, in this way the reiteration makes the maintenance less demanding.

11. **Worldwide Connectivity:** E-learning gives quick and huge access to learning assets. There is no importance of grounds limit of foundations in e-learning. We can interface ourselves around the world. We can join distinctive students and instructors gatherings and long range informal communication sites. We can approach the libraries of different nations arranged in various nations. E-learning breaks all limits and gives a boundless fortune of information to the students and instructors.

12. **Quick Access:** Fast access to the information assets is an essential element of e-learning. We can get into the interminable e-assets by only one mouse click. We can approach of different digital books and e-diaries in a couple of moment's seconds as it were.

13. **Adaptability:** E-learning offers decisions to the students of time of learning and place of learning. In customary classroom based learning strategy learning time and place are settled. Understudies will undoubtedly come into a specific classroom at a specific time. E-learning enables the students to get the hang of as indicated by their comfort.

14. **Distribution of quality material by virtual classes:** It has been observed that quality sources of knowledge are concentrated only at few institutions and cities.

CONCLUSION

Various advantages of these devices like network, flexibility, intuitiveness have been outlined. In any case, it is likewise called attention to that one ought to be watchful in the utilization of these innovative devices so students don't feel overpowered by thesetechnology of these tools. E-learning play an essential in the field of modern education.Accordingly, these are advantageous to instruction, partnerships and to a wide range of educators/students. It is the successful learning process made by joining carefully conveyed substance with learning backing and service.

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12

IMPORTANCE OF ICT IN THE PROCESS OF TEACHING AND LEARNING

*Jyoti Bala**

The quality of education depends upon the quality of teachers. In the modern education scenario teacher education plays very important role in developing quality education. Teachers are the pillars of nation. So the teacher should be well verse with the current knowledge in their subject.The teacher should undergo with orientation ,refresher course,seminars and workshop to enhance their knowledge. The technology has penetrated into all areas including higher education.ICT is a part of our lives for the last few decades affecting our society as well as individual life. It is now broadly used in educational world. Teacher, Student, administrator and every people related to education are popularly used ICT. It enables self paced learning through various tools such as assignment, computer and internet etc. which result teaching learning process has become more productive and meaningful. ICT helps in fostering a live contact between the teacher and students through e-mail, e-learning. The introduction of ICT in the education has profound implication for whole education process. It is a force that has changed many aspect of our life. In modern science and technological societies education demands more knowledge of teacher regarding ICT and skills to use ICT in teaching –learning process.

Keywords: *ICT, student teacher, quality learning, computer etc.*

INTRODUCTION

Information and Communication Technologies consist of the hardware, software, networks, and media for collection, storage, processing, transmission and presentation of information (voice, data, text, images), as well as related services.Information and Communication Technology (ICT) can contribute to universal access to Education, equity in education, the delivery of quality learning and reaching, teachers' professional development and more efficient education management, governance and administration. Researches indicate that with the emergence and expansion of ICT in education, the most basic changes in terms of quality have been achieved with regards to teachers' performance and classroom interactions. ICT, as an industrial revolution, has brought about a new era of Information and Communications followed by information society, where ICT is among its main elements.The duty of the Educational system is to plan training of ICT while considering acquaintance with information skills and the necessity with which a framework is laid to deal with IT.

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NEED AND SIGNIFICANCE OF THE STUDY

The classroom is now changing its look from the traditional one i. e. from one way to two way communication. Now teachers as well as students participate in classroom discussion. Now Education is based on child centric education. So the teacher should prepare to cope up with different technology for using them in the classroom for making teaching learning interested. For effective implementation of certain student centric methodologies such as project-based learning which puts the students in the role of active researches and technology becomes the appropriate tool. ICT has enabled better and swifter communication; presentation of ideas more effective and relevant way. It is an effective tool for information acquiring-thus students are encouraged to look for information from multiple sources and they are now more informed then before. So for this reason ICT is very much necessary for Teacher Education.Students learn from multi sources and for this reason use of ICT &Multimedia is very much essential in educational field and simultaneously teacher sknowledge of ICT and Multimedia also required. So present study has great need and significance because this study shows importance of ICT in the process of teaching and learning.

OBJECTIVE OF THE STUDY

The objective of the present study is –

- To find out the importance of ICT in process of teaching and learning.
- To find out the barriers in teaching learning process and how to overcome from them.

RESEARCH METHODOLOGY

This present study is based on secondary sources like books, Articles, Journals and websites etc.

FUNCTIONS OF ICT IN EDUCATION

(a) ICT as a Change agent in Teaching Learning Process: ICT has unique importance in the educational system and social transactions. It has improved the way students/teachers work, learn, play and most importantly communicate. Its approach in teaching learning is psychologically sound and motivates the students for learning. The use of technological approaches in teaching learning has a positive effect on education, motivating students, promoting learning and changing classroom interaction . It provides favorable learning environment so that students can participate actively .The use of multimedia makes classroom interesting, livelier and improve the student's achievement. In the process of conventional learning, emphasis was given on contents. It follows the particular course structure / syllabus for many years. It is the need of the day to improve quality &structure of the syllabi by enforcing competency & performance based approach towards it. Accordingly, the subject wise textbooks & reference books have been written. One such curricula requires: Access to information types & different forms, Student-centered learning though information access & inquiry. With the help of technologies, it is possible to promote transformation of education from teacher centered instruction to students centered instruction

(b) The Impact of ICT on Place: In the past, there was no or little choice for students in terms of method & manner in which programs have been delivered. Students being forced to accept what have been delivered. ICT applications provide many options &choices in the same case. It is the good opportunity for students to undertake education anywhere, anytime & any place. The use

of ICT has extended the scope of offering programs at a distance. The off-campus delivery was an option for students who were unable to attend the campuses. Today, many students are able to make this choice through technology-facilitated learning settings, e.g. in many instances, traditional classroom learning has given way to learning in work-based settings with students able to access courses and programs from their workplace. The communications capabilities of modem technologies provide opportunities for many learners to enroll in courses offered by external institutions rather than those situated locally. In case of geographical flexibility, technology, facilitated educational programs also remove the temporal constraints e.g.through online technologies, learning has become an activity that is no longer set within programmed schedules and slots . Learners are free to participate in learning activities when time permits and these freedoms have greatly increased the opportunities for many students to participate in formal programs. With the Internet and the World Wide Web, a wealth of learning materials in almost every subject and in a variety of media can now be accessed from anywhere at any time of the day and by an unlimited number of people. This is particularly significant for many schools in developing countries and even some in developed countries, that have limited and outdated library resources, ICTs also facilitate access to resource persons—mentors, experts, researchers, professionals, business leaders and peers-all over the world.

(c) Improve the Quality of Education: ICT encompasses the effective use of equipment and programs to access, retrieve, store, organize, manipulate and present data and information. Improving the quality of education and training is a critical issue, particularly at a time of educational expansion. Videos, television and multimedia computer software that combine text, sound and colorful moving images can be used to provide challenging and authentic content that will engage the student in the learning process. Interactive radio likewise makes use of sound effects, songs, dramatizations, comic skits and other performance conventions to compel the students to listen and become involved in the lessons being delivered. The transmission of basic skills and concepts that are the foundations of higher order thinking skills and creativity can be facilitated by ICT. It has also been used to improve access toknowledge and the quality of teacher training.

(d) ICT Enhancing Educational Management: Computer software programs are being used in time tabling andmanagement to improve the use of staff time, student time and space, thus reducing costs significantly. It is noted that ICTs in educational institutions can improve quality with less cost. ICTs have a very large potential for teacher education in larger quantity and better quality. A combination of old ICTs to widen coverage and access and new ICTs to provide interactivity are supposed to be cost-effective for teacher education. If a nationwide network of community learning centers equipped with computer laboratories with broadband access and trained staff to access online distance learning and to provide tutoring support could be set up in developing countries until a computer is available at home, there are possibilities for these countries to take advantage of the benefits of e-learning.

BARRIERS IN TEACHING LEARNING PROCESS

1. Lack of Teacher Confidence and Competence: Several researchers indicate one barrier that prevents teachers from using ICT in their teaching is lack of confidence. Another barrier, which is directly related to teacher confidence, is teachers'competence in integrating ICT into pedagogical practice and are not enthusiastic about the change and integration of supplementary learning associated with bringing computers into their teacher practices.

2. **Resistance to Change and Negative Attitude:** The barriers to the integration of ICT into education found that teacher' attitude and an inherent resistance to change are a significant barrier.Integrating the new technologies into educational settings require change and different teachers will handle this change differently. Considering the different teachers' attitudes to change is important because teachers' beliefs influence what they do in classrooms. Teachers who are not using new technology such as computers in the classroom are still of the opinion that use ICT has no benefit.

3. **Lack of Time:** Several studies indicate that many teachers have competence and confidence in using computers in theclassroom, but they still make little use of technologies because they do not have enough time. The most common challenge reported by all the teachers is the lack of time they had to plan technologylessons, explore the different Internet sites, or look at various aspects of educational software.

4. **Lack of Effective Training:** The barrier the most frequently referred to in the literature is lack of effective training. It is found that there are not enough training opportunities for teachers in the use of ICT in a classroom environment. There were time for training, pedagogical training, skill training and an ICT use in initial teacher training.

5. **Lack of Accessibility:** Lack of access to resources, including home access, is another complex barrier that discourages teachers from integrating new technologies into education. For example a lack of computers and a lack of adequate material.It is found that low numbers of computers, oldness and slowness of ICT systems and scarcity of educational software in the educational institutions are barriers to the successful implementation of ICT into education.

6. **Lack of Technical Support:** Without both good technical support in the classroom ,teachers cannot be expected to overcome the barriers preventing them from using ICT. It is found that one of the top barriers to ICT use in education is lack of technical assistance. Technical problems are the major barriers for teachers. These technical barriers included waiting for website to open, failing to connect to the Internet, printers not printing, malfunctioning computers and teacher having to work on old computers.

OVERCOMING BARRIERS TO THE EFFECTIVE IMPLEMENTATION OF TECHNOLOGY IN EDUCATION.

1. **Overcome your fear of being introduced to unknown technological tools:** We are not born with knowledge of each and everything on the planet. You have familiarized yourselves with them with time as part of a natural process. Teachers can form small communities where they can discuss the challenges they face while integrating technology with education and share their knowledge of the technological tools they are familiar with. Also ,institutions can hold training sessions for teachers to have a better understanding before they go on to introduce the technological tool .

2. **Be innovative with the tools you are familiar with:** Take the risk. Even if it is a PC with Microsoft Office and Internet connection that you are familiar with, put it to good use by assigning projects or assignments to your students that they can complete using these tools. You can start with familiar tools and then go on to use newer ones. This can boost your confidence.

3. **Look for free easy-to-use digital resources:** There are many user-friendly digital resources like online applications available that you can use on your own. You may not need any one to guide you. After you learn to use them, introduce them to your students. Also, this is cost effective.

4. **Learn with your students:** Teachers can learn the working of technological tools along

with their students. They can discuss about various ideas that they can implement to create projects and learn. This technique works better than one day workshops and training sessions.

CONCLUSION

Education has a vital role in building the society. Education determines standard of society. The quality education helps to empowering the nation in all aspects by providing new thoughts and the ways of implementation of various technologies. There are number of effective teaching & learning methodologies in practice. Technology is the most effective way to increase the student's knowledge. The role of ICTs in education is recurring and unavoidable. Rapid changes in the technologies are indicating that the role of ICT in future will grow tremendously in the education. ICT energizes the classroom and enables students to develop good study habits and spirit of knowledge sharing. ICT also focuses modification of the role of teachers. It forces the teacher to look beyond the text book and traditional methods. Teachers will act as virtual guides for students who use electronic media.it also helps them to think independently, communicate creatively and helps students for building successful careers and lives, in an increasingly technological world.

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13

BIG DATA MARKET TRENDS IN E-COMMERCE INDUSTRY

*Manjit Kaur**

Modern era is flooded with a lot of development in the size of information as increased amount of data is produced& stored. Information development has experienced a tremendous growth, impacted basically by less expensive registering power and the pervasiveness of the web. This has prompted a change in perspective in the E-trade part; as information is never again observed as the result of their business exercises, however as their greatest resource giving: key experiences to the requirements of their clients, anticipating patterns in client's conduct, democratizing of commercial to suits buyers fluctuated needs, just as giving a presentation metric to survey the adequacy in addressing clients' needs. In this paper, the utilization of enormous information examination in the E-trade and the different advancements that make investigation of buyer information conceivable is talked about. Further this paper will exhibit some contextual investigations of how driving Ecommerce have applied Big Data Analytics (BDA) in their business techniques/exercises to improve their performances. The paper explains future difficulties and hence, various opportunities and deeper knowledge about big data analytics' role in e-commerce applications. In conclusion we recognize a few difficulties these E-business merchants face while implementing big data analytics in their business practices.

Keywords: *Big Data Analytics, E-Commerce, Predictive Analytics, Customer-Behaviour, Online Advertising, Online-Shopping, Artificial Neural Networks (ANN).*

INTRODUCTION

There is no bound together definition to express"Big Data", whereas, in any case, the most broadly acknowledged meaning of Big Data is with its three attributes, volume, velocity and variety, also called as 3Vs. Variety means that big data possesses both organized and unstructured datasets, Velocity delineates the speed at which information is caught, and Volume alludes to the size of information which is generally expressed in terms of Petabytes, Exabyte and Terabytes. Because of these qualities, it is difficult to viably oversee and analyse enormous information utilizing customary databases. In any case, utilizing exceptional tools, for example, Hadoop, Big Data can be adequately managed in real-time. Furthermore, when uncommon information mining calculations, (for example, AI and grouping calculation) are acquainted with the huge information diagnostic system, one can get understanding from information[1].Indian web based business organizations are effectively giving more prominent help to its clients. They can give recommendations over upcoming rebate offers if in the event that a client chooses not to purchase a specific item since he may have consumed his

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financial limit. Customized help is driven by the knowledge utilized from Big Data Analytics—agitating and handling of a lot of information to draw experiences and examples, holds huge importance for e-commerce companies.Just a couple of the organizations in India are as of now utilizing Big Data Analytics to give its clients an essential customized understanding and making suggestions dependent on the client's purchasing conduct. Aside from these customized proposals, continuous examination— reacting according to the customer's activity is obtaining the consideration of online retailers as the essential use, where analytics informationis being conveyed. Internet business organizations utilize Big Data in two different ways. Firstly, they use this to investigate past execution of clients to discover designs, and the other is real-time investigation, that is, responding when the client is shopping on the websites[2].

RELATIONSHIP BETWEEN BIG DATA ANALYTICS AND E-COMMERCE & ITS APPLICATION

Actual, logical, quantitative, prescient, subjective, and other models are fundamental essentials for Big Data Analytics (BDA). Therefore, BDA in online business may be described as an encompassing procedure that includes the assortment, examination, use, and elucidation of information for different useful divisions with the end goal of increasing significant bits of knowledge, making business esteem, and standing out of the crowd. Hence, this definition states the thought that expository systems can be utilized to deliver noteworthy experiences. Whereas, the unmistakable distinction today is the immense electronic transactions in the advanced economy and its related information. From the exchange cost hypothesis and the new institutional financial matters perspective, with regards to financial execution of internet business firms in the developing information economy, institutional structure can play a significant role in characterizing BDA[2].

Big Data Applications in E-Commerce:

Utilizing Predictive Analytics to anticipate customer-behaviour: Predictive Analytics alludes to the distinguishing proof of occasions before they happen using Big Data Analytics[3].Hence, this gathered information can empower e-commerce businesses to foresee which itemscan be customers' priority when it comes to purchase based upon customer behaviour and past deals on the website. With this, supply-chain can be managed more efficiently by predicting product demand in nearest future.

Personalized and Customized Products: Big Data Analytics encourages serving clients with customized administration or customized items. It offers promotion of several products under distinct categories. Also, it has been indicated that personalization can improve the sales by 10 % or more and may give five to multiple times the return on investment on advertising uses[3][4]. Hence, distributing personalized interactions can be a powerful tool to maximize profits.

Detecting fraudulent activities and handling: Big Data can help in recognizing fraud activities. Furthermore, if such incidents detected in real-time, it can promote fast action towards solving and preventing these actions. For this, fraud detection patterns holds huge importance because its results combined with Big Data Analytics support in early recognition and nullifying the effect of such practices. Having right IT framework, E-Commerce firms can investigate information at an accumulated level to distinguish misrepresentation[3][4]. Above all, E-Commerce firms can distinguish misrepresentation continuously by consolidating exchange information with customers' buying history,

web logs, social feed, and geospatial area information from cell phone applications.

Time-based Pricing: So as to pull in new clients, E-Commerce organizations must be careful and dynamic while setting focused cost for the items. Internet business firms need to effectively impact the client to purchase at their webpage, which includes setting a focused value[3] [4]. Dynamic prices of products is required as larger part of items contend on cost offered with different destinations.

*Enhanced Firm Performance Utilizing Big Data:*Implementers of BDA are related with upgraded firm execution. The organizations that put resources into Big Data Analytics, had higher work efficiency levels and client responsiveness than those who did not[3]. This is clarified by the finding that information obtained through BDA innovations can build the profits by improving the profundity of understanding, that organizations get from associations with clients, contenders, and providers, just as the speed at which they react.

Improved Customer Service: Online retailers can utilize Big Data to give unique client assistance experience. Giving phenomenal client administration can lead firms to accomplish their goals and leading with a competitive place in the industry, despite the fact that the item is in the more significant expensivesection of the store[3].

Visibility of Supply Chain: In the present market situation, the support of track your products requested on the web, while the merchandise are still in shipment has become the standard. Clients expect explicit information, for example, the careful accessibility, status and area of their requests.

This includes utilization of significant data infrastructure, when E-Commerce firms host different third parties, for example, warehousing and transportation suppliers in their inventory network. The organizations should have the option to quickly accumulate data from every included part in supply-chain management and shipping process on all items to precisely give expected conveyance to clients[3] [4].

CATEGORIZATION OF BIG DATA IN E-COMMERCE

E-commerce mainly refers to selling products online. Due to this, it involves huge customer interaction with numerous transactions in a day. Therefore, following four types of big data are used by e-commerce companies [5]:

*Video Data (Multimedia Formats):*Combining image analysis software with click stream data, e-commerce companies are targeting to provide enhanced value to their firms by predicting customer viewing habits (for example, Netflix), and thereby evaluate the quality of their customer's experience. This also helps in getting the better insight about customer preferences and them aligning the future strategies to set a competitive place in the marketplace.

*Voice Data (Streaming):*This data mainly refers to data obtained from phone calls in call centres and customer support services. This helps in analysing clients' purchase habits and reaching new consumers. Personalized experience over phone calls while customers connect to customer care centres may be advantageous for the e-commerce websites.

*Data Related to Business Activities and Transactions:*This includes structured data involving customer profiles and complaints from customers maintained by e-commerce businesses. This data is mainly obtained through loyalty programs which helps the organizations to analyse customer preferences.

Click-stream Data: This type of data originates from social media platforms such as Twitter, Facebook etc., web and other online advertisements. This supports the organizations to make future

marketing strategies based upon which platform seems to be more engaging to the customers, offering profits at the same time.

CHALLENGES AND DRAWBACKS OF BIG DATA ANALYTICS IN E-COMMERCE

To embark with, protection and data security are main concerns related to Big Data Analytics due to its distinctive characteristics in thee-commerce environment. The high volume and grouping of information makes it more attractive for hackers. Furthermore, higher information volume expands the likelihood that the information files and reports may contain naturally significant and user's sensitive private data, which again makes it an easy target for cyber criminals because they try to extract important information from huge data sets. Studies also indicate that, there is an expanding buyer worry over protection with regards to ongoing social promoting and attaching cookies. A high assorted variety of Big data lead to associations coming up short on the capacity to oversee and unravel these information, and thus, third parties have chances to get to information[7]. They may not conform to information insurance guidelines for regarding data privacy and protection.

Similarly, influenced with some groups may somewhat make a client change their expectation as they review group thinking. Now and then, shoppers avoid brands which they accept would place them into a category that they would prefer not to be a part. Individuals purchase things to help structure and express their self-idea and their associations with similar individuals. An individual choice can change under informal communities influenced by overall group feeling. Buyers post their reviews after they buy items on the site. The blend of positive and negative customer reviews influence clients' choice. Online customers are especially influenced by such networks, and a bigger level of them make their final decision of purchasing based upon already existing feedback within reviews. In such scenarios, negative groupings influence adversely more firmly than positive ones influence customer behaviour[7].

In the end, shopping addiction is a type of under perceived social enslavement. For shopping addicts, shopping gets uncontrolled and they not just purchase things they need or they like, but they also spend their money and are anxious to miss a good opportunity to purchase something. These items may not be utilized after buying. Utilizing the uses of Big Data Analytics, the site can suggest customer different items as substitute or corresponding items. This application is extremely valuable for clients with items they need to purchase, yet this is likewise hurtful for clients. They invest more energy to survey more items to settle on choice. It additionally suggests other integral item which client feels they have to buy to build the bought items. For instance, a client has bought an exceptionally excellent pink dress and the site suggests her important socks or shoes that are reasonable with the dress. They are wanted to join together to give consumer loyalty. Client needs to invest energy and cash to purchase these integral items on account of a decent chance to get them, even with less cash. Shopping addictions are found to appear under two essential measurements: propensity to spend and post-buy feeling[7]. Hence, utilizing Big Data Analytics for marketing and online advertisement strategies holds huge potential to influence customers' buying behaviour. Therefore, following limitations may be seen in marketing analytics when big data is utilized to promote e-commerce businesses:

- Certain advertising channels are appropriate for applying client level information, for an instance, site personalization, dynamic creatives, email automation process etc. In numerous channels it is troublesome to apply client information legitimately to execution with the

exception of by means of segmented collection and focusing on data given by the stage or distributer. Social channels and paid advertisements are also based upon segment level information extracted through analytics. For offline networks and premium presentation, client level information can't be applied to execution by any stretch of the imagination[8].

- Due to security and user-privacy related concerns, client information cannot be made available to simply anybody, and requires care in moving from machine to machine, server to server. Therefore, database administrators are restricted to the quantity of individuals who approaches their website or channel at first instance. For this reason data mining requires huge efforts to get best results[8].
- The client level information that advertisers approach is just of people who have visited your website or saw online promotions, which is ordinarily not agent of the absolute objective purchaser base. This is because not all users use only single device to access information. Therefore, client level information is a long way from being precise or complete, which implies that there is innate threat in expecting that bits of knowledge from client level information applies to customer base on the loose[8].
- Client level results may not be presented directly because it very well exhibited through chart etc. Hence, client level information requires to be collected up to a day by day section level or property-level in any event all together for the outcomes to be consumable for understanding overall results [8].
- Generally, there are just two different ways to break down client level information: one is to fragment or another and afterward apply factual investigation; the other is to examine the informational index straightforwardly utilizing algorithmic techniques. Both can bring about forecasts and suggestions, yet algorithmic examinations will in general experience issues replying "why" questions (for example for what reason should we move spend from one online campaign to the other) in a way intelligible to the normal advertiser. Due to these reasons, particular sorts of calculations, for example, Artificial Neural Networks (ANN) are secret elements even to the information researchers who structured it [8].
- Client data is not suited for producing learnings because small datasets stay less efficient in creating reasonable learnings that you can apply to execution today [8].
- A solitary exception can totally lose significance of extracted analytic results. To illustrate, in investigating and efficiently analysing touch point information may lead to artificial and undesirable impressions impacting the final results of Big Data Analytics [8].

CONCLUSION

As the information obtained from Big Data Analytics is been utilized in numerous divisions, it broadly impacts E-business administrations and has a significant importance in business related decisions and future strategies. The use of enormous information has gigantically developed in internet business, numerous large retailers value this Big Data information which encourages them for anticipating the client interests and give their clients relative and intrigued look through when they shop on their site, with the goal that they draw in the client by giving the required and significant ventures of the items or things. Hence it is quite clear that Big Data Analytics is advantageous for both the clients as well as for the retailers. In today's fast-paced society, clients generally go with the online ads or through search engines by diminishing the wastefulness of the ongoing markets.

Organizations can analyse their status regarding specific item to develop, with the challenge and gain a competitive advantage. Further, their performance can be measured by gaining knowledge about their comparative place in the industry[6]. There are various advancements available these days, which are accessible at the center of processing big data information. The discourse of different papers expresses that Hadoop server as one of the best system for giving adaptable and cheap stage for preparing the information. Several researches indicate that online retailers utilize BDA for better shopping experience, gain consumer loyalty and produce more deals. This may positively affect results and efficiency. In addition, privacy and data related can be addressed more precisely by integrating the modern advancements while implementing BDA in an organization.

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14

FACTORS CREATING HINDRANCES IN USE OF ICT IN EDUCATION

*Isha Tiwari**

This study investigates teachers' attitudes, beliefs about using ICT in education along with various factors influencing use of ICT among them. ICT is an acronym that stands for "Information Communication Technologies". Information and communication technologies are an umbrella term that includes all technologies for the manipulation and communication of information. Education is often viewed as a way to move the nations into the information age. It is also frequently contended that there is a need to transform education to meet the new challenges facing society. Digital technology is often presented as the driving force for the transformation of education but the personal characteristics of individual teachers such as age and gender influence the use of ICT in education. In this paper I have tried to make an attempt to study the various factors creating hindrances inuse of ICT by teachers in education.

Key Words: *Education, Technology and factors etc.*

Globalisation and the widespread of ICT in all spheres of life have created such a system which is driven by knowledge and powered by technology. ICT has begun to have a presence but unfortunately we are lacking to achieve desired result. The education is a socially oriented activity andit also plays a vital role in building the society. The quality education traditionally is associated with strong teachers having high degrees and qualification but nowby Using ICTs in education we have moved to more student – centred learning as compare to traditional teacher centred learning. As world is moving rapidly towards digital information, the role of ICTs in education becoming more and more important and this importance will continue to grow and develop in 21st century.

The prominence of ICT has also put the various education systems under pressure to use ICT in teaching- learning process as a need of hour ButThere are a lot of factorsthat influence the use of ICT in teaching and learning such as: insufficient number of computers and lack of application programs, teacher generation gap, inadequate teacher training, lack of ICT skill and lack of confidence, teachers' beliefs, poor leadership and lack of public support.

REVIEW OF LITERATURE

Eze and Olusola (2013) state that in Botswana, lack of electricity in rural schools and the high cost of computers is a stumbling block to the integration of ICT. Internet connectivity is still impossible where there are no telephones and electricity.

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Literature study (Tedla, 2012 and Makgato, 2012) reveal that the successful integration of ICT in teaching and learning largely depends on the availability of ICT infrastructure and teachers' adoption and embrace of ICT in education.

Tedla (2012) states that new technologies have the potential to promote and to transform teaching and learning processes. He furthers asserts that ICTs also provide effective teaching-learning atmospheres by providing opportunities for effective communication between teachers and learners.

Aktaruzzaman, Shamim and Clement (2011: 114) maintain that teacher competency is another indispensable variable to ensure the successful use of ICT in the teaching and learning environment.

The use of ICT in some countries is regarded as unholy and is against the people's religion. Sang, Valcke, Van Braak, Tondeur and Zhu (2010) also assert that teacher's positive attitude and constructivist beliefs towards ICT is a big determinant of integrating ICT in teaching and learning.

Despite successful efforts to acquire computer hardware and to raise the student to computer ratio to 5:1 (World Almanac, 2002), there has been less success identifying, which computer skills should be taught in school and how computers can be used for teaching and learning (Dooling, 2000). Thus, current attention has turned to what is actually happening in the classroom with computer technology.

Technology should be used as a tool to support the educational objectives such as skills for searching and assessing information, cooperation, communication and problem solving which are important for the preparation of children for the knowledge society (Drent&Meelissen 2007). In fact, innovative use of ICT can facilitate student centered learning (Drent, 2005). Hence, every classroom teacher should use learning technologies to enhance their student learning in every subject because it can engage the thinking, decision making, problem solving and reasoning behaviors of students (Grabe & Grabe, 2001). These are cognitive behaviors that children need to learn in an information age.

OBJECTIVES OF STUDY

- To study the role of ICT in education
- To identify the hindrances involved in use of ICT

ROLE OF ICT IN HIGHER EDUCATION

There is substantial evidence that ICT is an integral part of the global society and its value in educational institutions is to help in knowledge creation, knowledge sharing, problem solving, communication, group and cooperative learning, the development of economic and social change. To sum up, we can say that ICT helps:

- To increase variety of educational services & medium
- To promote equal opportunities to obtain education & information.
- To develop a system of collecting & disseminating educational information.
- To promote technology literacy.

The rapid innovations and developments in the field of information and communication technology (ICT) have changed the work environment in the libraries also all over the globe. These technological innovations and advanced approaches have transformed library services. New concepts such as hybrid library, digital library, virtual library, internet public library, paperless library etc have emerged over a period of time. The information resources are available in electronic form.

Factors influencing use of ICT/Hindrances in use of ICT in education

There are numerous factors influencinguse of ICT and creating hindrances in ICT use in education which can be described as:

- *Computers and other hardware:*The number of computers available for use by students is generally less than the number of students in the class. This is a concern expressed by all teachers due to overcrowding. Teachers expressed that it is impossible for each learner to have his or her own computer and consequently they are grouped to work on one computer at a time which creates a hindrance in use of ICT.
- *Technophobia*: The non-use of ICT by the older generation of teachers came out as a major obstacle that impedes ICT integration in teaching and learning. It emerged during the interviews that older teachers believe that ICTs are not meant for them; as a result they are anxious and are afraid of using ICT for teaching and learning.
- *Lack of digital skills*: Lack of digital skills is also an important factor as Teachers are said to be afraid of use of ICT because they do not know how to use these gadgets.
- *Resistance to change and negative attitude*: Change is commonly not an easy thing that will take place smoothly because it is something unusual and frightening. Old teachers who are comfortable with the traditional way of teaching do not want new and innovative methods of teaching.
- *Lack of time*: Some competent teachers make little use of ICT and attribute the reasondue to lack of insufficient time available for preparation of classes.
- *Lack of access*: Another factor is lack of access to ICT resources and lack of internet connectivity. Lack of educational hardware is also a major problem that prevents both teachers and learners from using ICT in teaching and learning.
- *Lack of proper training on use of ICT*:Using the computer for preparing lessons does not require a lot effort, but to use ICT in classrooms at advanced level requires some efforts for which trainings are required.
- *Teachers' Characteristics:* Teachers' characteristics such as individual's educational level, age, gender, educational experience, experience with the computer for educational purposes and financial position can influence the use of ICT. The report by the National Centre for Education Statistics (2000) indicated that teachers with fewer years of experience were more likely to use computers in their classes than teachers with more years of experience. More specifically, teachers with three years or less teaching experience reported using computers 48% of the time; teachers with 4-9 years, 45% of the time; those with 10-19 years, 47% of the time, while teachers with 20 years or more reportedly used computers only 33% of the time. This may be due, in part, to the fact that new teachers have been exposed to computers during their training and therefore, have more experience using this tool.
- *Available Support to Computer-Using Teacher in the Workplace:* The National Council for the Accreditation of Teacher Education (NCATE) (1997) reported the lack of technical support as one of the major barriers that resulted in computers being underutilized in the classes. Teachers did not want to use computers because they are not sure where to turn for help when something went wrong while using computers.

CONCLUSION

The role of ICTs in the education is recurring and unavoidable.The quality education is basic need of the society and for that purpose there are number of effective teaching & learning methodologies in practice. Technology is the most effective way to increase the student's knowledge. Rapid changes in the technologies are indicating that the role of ICT in future will grow tremendously in the education but all the factors creating hindrances in the use of ICT in education should be minimized if not eliminated so that the future of education can take a remarkable shift.The Government, parents and the community should improve in the provision of ICT equipments, computer text books to enhance the level of accessibility and decrease the cost of the ICT equipments. There should be regular teachers ICT training. This will enhance the skills on them.

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15

ROLE OF ICT IN QUALITY TEACHING

*Gagandeep Singh**

With the change in time traditional learning is getting old fashioned and people are getting more attracted towards enabled education, E- learning, Virtual education. This makes teaching not only interesting but effective as well. This is a kind of self learning process. In classroom most material is told verbally to the students by the teacher but ICT brings world to the classroom. It also grabs the interest of students which helps them to learn effectively and efficiently. This paper is about the modern teaching aids that can help both teacher and student in many aspects.

INTRODUCTION

Types of Teaching Aids:

1. **Interactive Teaching Aids:** Interactive teaching aids something which involve both teacher and student in learning. Any teaching aid can work as interactive teaching and if teacher creates scope for student participation.
2. **Virtual Teaching Aids:** All type of aids that makes learning happening through visual are considered visual aids. From flash cards, to TV or LCD projector, models, diagrams can be considered visual aids.
3. **Audio Teaching Aids:** Audio teaching aids can be very effective in language classes. Tape recorders or voice recorders can produces better result while correcting mistake in pronunciation.
4. **Alphabet and Chart:** Alphabets and numerals in clay or plastic play are very important role in pre-schools while teaching alphabets and numerals for beginners. Alphabet can grow up with student age and play an important role in increasing vocabulary.
5. **Books as Teaching Aids:** Experts today believe and are trying to implement the idea that books are basically a teaching aid. And with handy instructions, activity ideas, games incorporated with a lesson books are actually becoming the best teaching aid for a teacher.

ICT stands for information and communication technology. This includes computer, internet and satellite or wireless technology. The system defined above as a whole used to produce, store, process, distribute and exchange the information. It can reach to every corner of the world. Perryton (2002) noted that technology enhanced education is generally perceived as a way of relieving poverty, social division and improve living standards due to the fact that technologies can deliver educational

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programmes at a lower cost than traditional education system. Thus, ICT enabled education system is cost effective (Perryton, 2002). There are varieties of productivity tools available that can be used with ICT to make teaching easy. We can also take references from online atlas, encyclopaedia etc. Moreover educational games make teaching interactive.

HOW ICT LEARLING DIFFERENT FROM TRADITIONAL LEARNING?

1. **Meets the needs of students to be wise consumer of media:** The manager of information and responsible producers of their ideas using the powerful multimedia tools of global media culture.
2. **Individual student and society:** Individual and society by providing tools and method that encourage respectful discourse that leads to natural understanding the citizenship skills.
3. **Increasing the efficiency and effectiveness of management and administration:** ICT allows educational institution greater access to timely relevant and detailed information on many functions. This allows far effective management and organisational performance with regard to planning monitoring, improvement and accountability.
4. **E-Learning:** E-Learning is about learning and teaching using ICT in the Learning environment. E-Learning is vital for fabricating young people to make them comfortable with technology as they are growing up in gradually more digital world.
5. **Assessment:** Assessment is an important driver and once ICT is embedded in learning and teaching process, it can be efficiently utilised in assessment. ICT can significantly increase efficiency and streamline the labour-intensive assessment administration process.
6. **Communication and collaboration:** Many new technology based tools for education are increasingly focusing on communication and collaboration between educators, learners and parents.
7. **Open Education Resources:** Open Education Resources are open source digital platforms that allow teachers and institutions to upload, share, edit and rate educational content online enabling an online programme responsibility of content.
8. **ICT improving the process of learning and coaching:** ICT affected the field of education, which have certainly affected teaching, learning and research. ICT have the potential to accelerate, enrich, and deepen skills, to motivate and engage students, to help relate school experience to work practices, create economic viability for tomorrow's workers, as well as strengthening teaching and helping schools change. In a rapidly developing world, basic education for every individual is essential so that he or she can be able to learn and can implement knowledge. For this ICT is making a lot of contribution in the global village.
9. **ICT increasing the quality and accessibility of education:** Using ICT student can access knowledge anywhere and anytime which increases the flexibility education so that learner can access knowledge anytime and from anywhere. It can manipulate the way student are taught and how they learn. Now the classes are learner driven and not teacher driven.
10. **ICT developing leaning Environment:** ICT presents an exclusively new learning environment for learners, thus call for different skills set to be successful. Critical thinking,

research and evaluation skills are growing in importance as students have increasing volumes of information from a variety of sources to sort through.

11. **ICT providing learning motivation:** ICT can enhance the quality of education in several ways by increasing learner motivation and involvement, by facilitating the equitation of basic skills and by enhancing teacher training. ICT also have transformational tools which when used appropriately can promote the shift to a learner centred environment.
12. **ICT improving academic performance:** Based on the wide-ranging usage of ICT in education, it increases the interest of student in learning which results in better academic performance.
13. **A Supportive community:** Teachers and E-Learning establishment should encourage a strong sense of community amongst their online student. This will enable student to interact with one another and the instructors as well as with the resource provided, making for enhanced educational.
14. **Clear expectation:** Student should be aware of what they will be receiving from the virtual class instruction and both parties should know the preferred method of communication and delivery of the care curriculum.
15. **Effective usage of available resources:** To get the most out of the E-Learning experience both the teachers and the students should take full advantage of the vast amount of resources that are available online.

DIFFERENT PHASES OF ICT IMPLEMENTATION:

New inventions in technology and the way technology is integrated into a system is a dynamic process. In a school, different subjects are taught using different approaches. Similarly, ICT also follow certain approaches. These approaches are hierarchical starting from the emerging approach, and the transforming approach as a goal many perceive as the future of education.

Emerging

In this approach schools begin to purchase ICT equipment or manage to buy from donations. In this phase, administrators and teachers just start exploring the pros and cons of adding ICT in school. The major part of teaching is still done using traditional methods. And ICT is used as extra class. For example, teachers are taking their classes in a way they were doing earlier. Extra time will be provided to students for ICT class.

Applying

This approach is linked with schools in which teachers and administrators have a new understanding of ICT in learning. In this phase, only those lessons are carried out that are already delivered by the teacher in class using traditional method. Teachers still largely dominate the learning environment.

Infusing

When a school have a range of computer- based technologies in laboratories, classrooms, and administrative areas, Then infusing phase is implemented. Teachers here explore new methods in which ICT changes their personal productivity and professional practice. ICT class begin to merge with the study according to curriculum

Transforming

The transforming approach is linked with schools that have used ICT creatively to rethink and renew school organization. ICT becomes an integral though invisible part of the daily personal productivity and professional practice. The focus of the curriculum is now much more learner-centred and integrates subject areas in real-world applications.

BENIFITS OF ICT:

1. Increase efficiency of both teacher and student.
2. Helps in providing high quality education.
3. More focused teaching.
4. Flexible class timings.
5. Information sharing is easy.
6. Easy to plan lessons for students.
7. Increase in grades, confidence and overall personality of student.
8. Increased involvement of parents.
9. Making students aware of technology.
10. Very helpful in distant education.

CONCLUSION

Technology can play a very important role in improving the learning process. It can provide worldwide opportunities to the students as ICT provides high quality education. It fills the gap between countries. Most importantly students will learn things with interest, which helps them to store knowledge in their mind. Thus in this way ICT will help in nation building. Because of the 24*7 availability of lecture, students can do study and other things like job, sports etc. One drawback of ICT is that it is bit costly so it is not possible for every institution to implement. But I would say that government should help such intuitions to implement ICT because nothing is more important than the brighter youth.

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ROLE OF ICT IN BUSINESS MANAGEMENT : A CONCEPTUAL REVIEW

*Amandeep**

Today, technology is becoming very important in our daily lives. It affects individuals, communities, businesses and the nation. Highly technological impact in the business world. it has helped in terms of management, manufacturing, marketing of communication products and modular type more easily. ICT includes all digital technology that assists individuals, businesses and organizations in using information. It covers all electronic products that deal with information in a digital form. Therefore, ICT is concerned with digital data storage, retrieval and transmission. ICT makes a business more efficient, effective and promptly respond to customers' needs. ICT can assist business activities including design, manufacturing, R&D, distribution and sales and feedback. This theme includes a deep analysis of the impact of the information and communication technologies on different aspects of development and growth. It covers topics related to the financial, economic and technological aspects and stress on the importance of ICT their role in facilitating a wide range of services and transactions such as online banking and online services provided by companies. The role of ICT in business is seen in how it can help your company become more productive, increase performance ,save money, improve the customer experience ,streamline communications and enhance managerial decision- making .It also play a role in helping companies expand globally and in providing staff access to company information wherever and whenever they need.

Keywords: *Information, Technology, communication, Management, Business Environment*

INTRODUCTION

The use of ICT technologies and application has started since 1990's. Information and Communication Technology system include computers, laptops and tablets, fixed and mobile telephone systems, communication network software-even wearable's. Your business can use ICT system to benefit from improvement such as reducing cost, increasing efficiency, improving decision making and increasing your competitiveness in the marketplace. Information technology has become very important in the business world. no matter small or big business, IT has helped the organization, manager, and workers in a more efficient management, to inquire about a particular problem, conceive its complexity, and generate new products and services; thereby, improving their productivity and output. Technology also gave us greater efficiency for conducting business.

Some of the areas in which technology is crucial to business include point of sales systems, the use of ICT in management, accounting systems, and other complex aspects of everyday business

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activities. Even something as simple as the calculator, which was revolutionary in its time, came about because of technology. It is tough to imagine going back to performing tasks manually. It would take us back about 100 or so years. Information technology is the use of computers and software to manage information. It refers to anything related to computing technology, such as networking, hardware, software, the Internet, or the people that involve with these technologies. Nowadays many companies have IT departments for managing the computers, networks, and other technical parts of their businesses, such as storing information, protecting information, processing the information, transmitting the information as necessary, and later retrieving information as necessary. This is referred to as Management Information Services (or MIS) or Information Services (or IS).

The purpose of this study is to investigate the impact of ICT application such as e-commerce and ERP on the production process of companies. It aims as well to highlight the role of each application and find the significance of these applications for business firms.

RESEARCH METHODLOGY

This paper aims to review the literature to find pattern and trends of using ICT applications in the business firms. The methodology that this research is using is intensive literature review .i.e. the research is using secondary data. The data collected from previous studies.

LITERATURE REVIEW

The extreme competition has led many business firms to search for new more powerful tools. A lot of firms have chosen to use Information and Communication Technologies as outstanding strategies to overcome the competitive environment and achieve a successful business (Sigala, 2003, as cited in Martinez, Gabriel and Navarro, 2010).

Barlow and Graham, (1999) investigated the use of information and communication technologies in a sample of 120 industrial and commercial libraries. Ninety-six per cent of the organizations which responded to the questionnaire use computers for some aspect of their library and information services. ICT was used for a range of office and other applications including, in rank order, e-mail, word processing, spreadsheets, presentation packages and database management systems. Ninety-one per cent of the sample used various Internet facilities including e-mail, World Wide Web, file transfer protocol (ftp) and telnet. Describes the results of the survey, reporting on the current state of the art of ICT use and future plans for automation in the sample. In the Information and Communication Technologies scenario service evaluation, standard stabilization and the concurrent development of hardware and software are key elements to design innovative systems.

Fernandez- Maldonado, (2002). Information and Communication Technologies (ICTs) have become central to education and training in Library and Information Science/Service (LIS) because of the great influence of these technologies on the professional world. This study on Kenya is part of a larger doctoral research project that aims to map and audit the types, nature and diffusion of ICTs in LIS education and training programmers in Africa. The findings indicate that all LIS schools in Kenya have embraced the use of ICTs, but there are major variations in terms of application. All but one LIS School offers a wide range of relevant ICT courses, many of them as core modules.

Ramazan Mohammad(2004) The current state of information communication technologies (ICT) application for information provision in Nigerian university libraries and make suggestions to enable them take fuller advantage of ICT facilities to provide information more effectively to users,

Okiy, (2005).

Salwani, Marthandan, Norzaidi & Chong, (2009). DV E-commerce usage which was measured by business performance IV i) technological context .technological competence ii) Organization context. Firm size, firm scope , when technological investment managerial beliefs. iii) Environmental context. Mediator variable were back end integration, frond end functionalities. A moderator variable was e-commerce experience. Result Technology competency, firm size, firm scope, web-technology investment, pressure intensity, and back-end usage have significant influence on e-commerce usage .Among these variables, back-end integration is found to function as a mediator. E-commerce experience is found to moderate the relationship between e-commerce usage and business performance.

OBJECTIVES

There have some objective of study:

- To analyze the role of information technology.
- To identify the advantage of information technology.
- To explain how to plan, manage and implement appropriate ICT infrastructure.
- To know how to use various technologies for record keeping and scheduling

ROLE OF INFORMATION & COMMUNICATION TECHNOLOGY IN BUSINESS

From your company's online store to the enterprise software your business uses to record transactions and gather information, information technology has an essential role in your small business's daily operations and success. In a dynamic business environment, accounting profession should deal with different multifaceted new issues. For instance, how to record innovative business transactions, expand value-added business and information processes, distribute valuable knowledge to a broad group of information users, and offer assurance services across a whole range of economic activities. Information communication and technology has drastically altered the way in which business is performed. Now, most companies used accounting information systems in running their operations. Developments in information technology have radically enhanced accounting systems. Computers and other digital technologies have amplified office productivity facilitating the fast exchange of documents, gathering and analysis of data.

In the present business scenario Information & communication Technology helps in different ways that are going to described below:

- **Communication:** In the business world, communication plays an important role in maintaining the relationship between employees, suppliers, and customers. Therefore, the use of IT we can simplify the way to communicate through e-mail, video chat rooms or social networking site.
- **Helps in Inventory Management:** Organizations need to maintain enough stock to meet demand without investing in more than they require. Inventory management systems identify the quantity of each item a company maintains, an order of additional stock by using a way of inventory management. It is become more important because organization need to maintain enough stock to meet customer demand. By using in IT in inventory management, it also will helps in track quantity of each item a company maintains, triggering when it comes to managing inventory.
- **Management Information Systems:** Information data is very important for an organization and a valuable resource requirement for the safe and effective care. Data used is as

part of a strategic plan for achieving the purpose and mission. then, the company should use the management information system (MIS) to enable the company to track sales data, expenditure and productivity as well as information to track profits from time to time, maximizing return on investment and recognize areas of improvement.

- **Customer Relationship Management:** Companies are using IT to improving the way of design and manage customer relationship. Customer Relationship Management (CRM) systems capture every relations a company has with a customer, so that a more experience gain is possible. If a customer makes a call to centre and report an issue, the customer relation officer will be able to see what the customer has purchased, view shipping information, call up the training manual for that item and effectively respond to the issue.
- **ICT & Business Decision-Making:** The role of information technology in management decision-making is seen in tools such as **ERP software and decision support systems** that help managers see company performance data in real time so that they can make more informed decisions. Such software presents an online dashboard with information about the company's finances, customers, sales and marketing trends and inventory levels. Managers can use the data to decide which products to promote or stop selling, where to cut expenses, which customers need support and when to place supply and materials orders.
- **Technology as a Link to the World:** Communication is a part of business. So, transportation and processes make business a web of complicated processes that interplay with each other. With technology, it has been possible to globalize business operations. Now, just about anyone can do business practically anywhere, from any room in their house. Technology has made it possible for businesses to have a wider reach in the world. The best example of this is the internet and the World Wide Web. The internet is now a crucial part of any businesses' marketing campaign, as it enables the business to attract customers worldwide.

OTHER BUSINESS ROLE OF ICT

Other examples of ICT's role in business include the following

- Internet –enabled system, such as secure entry system and wireless cameras, help to improve business security and reduce risk of theft and loss of confidential information.
- ICT allow companies to store important company data in a database in the cloud to reduce paper waste, increases security and allow for easy backups.
- ICT allow companies to expand internationally as easily as setting up a multi –language website that market to global customer and allow purchases in multiple currencies.
- From enabling telecommunication to reduce energy use through modern systems, IT has a role in company sustainability that can save money and improve the company's reputation.

Thanks to ICT, getting the latest information about your competitors and the market is as easy searching Google on your computer or Smartphone.

Why Is Information & Technology Important to an Organization?

It might be a little difficult to fathom the importance of information technology to an organization if you're not an IT professional. However, there are numerous ways in which information technology is crucial to an organization.

- **Business:** The business world changed forever when computers were introduced onto

the scene. Businesses can utilize information technology through the use of computers and different software to run their operations in a smoother fashion. They use it in different departments, including finance, manufacturing, human resources, and security.

- **Education:** Education is one of the frontiers of technology and is growing with technology every day. It's important that education be able to keep up with the progress happening in technology by reaching students in a way that adequately helps them to prepare for the future. The students in our classrooms today are meant to be the thought leaders, business people, teachers, and investors of tomorrow, so technology should be used to prepare them. This includes the use of gadgets in teaching, such as computers, mobile phones, and tablets, as well as the use of the internet as a medium of learning.
- **Finance:** With an increasing number of transactions happening online, it is important that financial and security institutions work together to make the internet a safe place. As more transactions are done on the internet, there will be a need for more networks and greater security, making it possible for banks to keep purchases and sales secure.
- **Health:** With improvements in information technology, it is becoming easier to reform the health sector. Medical offices are now able to share medical information with each other, and they can get your health data from your previous doctors. This makes it possible for timely care to be delivered, as well as for costs to be reduced.
- **Security:** With an increasing number of transactions being done online, there is an ever-increasing need for safety. Information technology is what makes it possible to keep your data and information safe and only accessible by you. Through the use of encryption and passwords, your digital data is safely hidden away and can only be accessed by those who have your permission.

How Does Information & Communication Technology Affect Business?

The Industrial Revolution changed things in the business world, making a lot of processes more efficient and increasing productivity a hundred-fold. However, the business world remained somewhat stagnant for a century after. With the technological revolution, and the use of technology in business, however, things changed even more disruptively than during the Industrial Revolution and it would be safe to say that things will never be the same again. The rate at which technology is evolving and adapting is exponential to the point where all businesses are being swept by the wave, whether they are ready for it or not. It might not seem like we've made that much progress, but even just 15 years ago, social media did not have any consumerism, mobile phones weren't used for business, cloud-based solutions did not exist, the App Generation was not born yet, and Omni-channel marketing was taking its baby steps.

Technology has just about changed every aspect of business in a big way and this has never happened this fast before in history. **To be more specific, here are a few ways in which information technology has affected business:**

❖ **The Advent of Mobile Solutions:** Mobility is seen by many as the next great frontier for businesses. Google's algorithms reflect this, as they make mobile websites a priority. Your business, and every aspect of it can be handled, using nothing more than a tablet or Smartphone. From content marketing to customer relations, to sales, the back-end stuff like invoicing and shipping, all of that power is in your hands.

But mobile solutions aren't just about businesses; they are also about consumers. The millennial

generation uses their phones to do everything from buying and selling to sharing their experiences with their friends and finding local businesses.

❖ **The Phenomenon of Cloud Computing:** Cloud computing has made it possible for businesses to outsource many of their functions to third parties using the internet. It makes it possible for variable data packages to be handled but also makes it possible for businesses to expand rapidly and embrace mobility without having to worry about such things as crashes, downtime, and lost data. This has enabled small and medium-sized businesses to gain access to resources that would have cost them a fortune only a few years ago. In effect, the playing field has been leveled.

❖ **Increased Customer Segmentation:** Since more and more data is flowing, it is now much easier to analyze and gain deep insight into the things that customers are looking for. Analytics services are expanding by the day and are allowing businesses to segment their prospects into more and more specific groups, making it much easier to target them and get more value for their advertising money. Something as simple as having a Google account can let a business know where a user is from, the kind of browser they're using, how they stumbled upon a website, What they do on that website, how long they are likely to stay and at what point they decide to leave. There are even more advanced analytics services that allow businesses to become even more refined with this segmentation in order to improve their conversions drastically.

❖ **Increased Connectivity:** Technology has made it easier for people to stay in touch. Whether you're looking to communicate with your employees and colleagues via video chat or sending email blasts to leads, mobile technology and the constant innovation that takes place within the space has made it possible for communication to take on a new level of hyper-realism.

❖ **Decreasing Costs and Increasing Utility:** There are two main things that have come together to make what is called a "buyer's market" possible. These are the fact that both hardware and software that are needed in creating the necessary software solutions have become more affordable and the fact that more and more entrepreneurs who are also tech-savvy are appearing by the day to make use of these technologies.

❖ **A Changing Consumer Base:** Millennials have come of age and they are now the force driving the modern economy. Pretty soon, over half the American workforce will consist of millennials and pretty soon they will also be coming into their peak affluence, where they will have a lot of money to spend and very few financial obligations, give them a lot of disposable income. Only a few years ago you could have gotten by if your customer service was just okay. Now you have to put in the extra effort if you don't want unfavorable ratings on review sites and people going on rants on social media about your service. Businesses, therefore, need to be careful about their online reputation and need to work on their digital footprint.

❖ **The End of Downtime:** This is actually a negative effect of technology. With increased connectivity, individuals have less and less time to themselves now. Vacation seems to have all but become a thing of the past, with most people working even when they're on vacation. Since we can always access our emails, texts, and social media through our phones and laptops, it is harder and harder to just disconnect and wind down.

CONCLUSION

This study was a literature review study .The application of ICT is pervasive. It is found in every industry. ICT is about processing and communicating information and this is associated with

all activities. ICT in heavy industry is not just in managing the business, but also the data created in the industry. There is ICT in automobiles; all these new electronic features are computer controlled. That is ICT. Everything now is networked via the Internet, and you can monitor and control devices remotely using ICT e.g. a security system in your home. Science and research uses ICT, to process large amount of data to support research findings. Applications are endless. ICT is an integral part of modern life.

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ICT FOR DELIVERING QUALITY IN TEACHING-LEARNING PROCESS

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Education should aim at making human life better not only through economic upliftment of individual but also through social, moral and spiritual strengthening. This will not only improve human life but also realize the "higher truth" i.e. "Tamaso Ma Jyotirgamaya" from darkness to light. The objective of the present paper is to focus on information and communication technology (ICT) as a potent tool for delivering quality teaching-learning process in the classroom. The paper would highlight the initiatives and services of ICT in improving the quality of teaching and learning in the classroom for retention of knowledge and better academic achievement of learners. ICT as an integrated part of education plays a central role in teaching-learning process. Technological advancements in ICT make teaching-learning more interesting, engaging, relevant and resulting it in learner-centered activity. It helps in increasing students' retention, arousing curiosity and generation of high level of thinking. Various services offered by ICT in India such as teacher training programmes like Intel Teach, Microsoft Shiksha, Sakshat Portal of Government of India and initiatives like NPTEL, MERLOT etc. for enhancing quality of teaching-learning process. Use of ICT in the form of smart classes, programmed learning, interactive CDs and videos helps teachers in imparting knowledge very effectively and efficiently in the classroom. The various web based resources like virtual labs, e-learning and digital libraries helps learners to find solutions of their problems and explore the world of knowledge as per their own time, pace and place. This effort of ICT helps in making classroom conducive and congenial which thereby helps in better teaching-learning process in the classroom.

Keywords: *ICT, quality, teaching-learning process, education*

INTRODUCTION

When one is conducting research and acquiring an understanding of the significance of ICT in education, it is necessary to understand its accurate meaning. ICT stands for information and communications technologies. These are the diverse set of technological tools and resources that are used to communicate, create, disseminate, store and manage information. Through expansion of ICT, the business environment gets permeated and the governments are provided with efficient infrastructure. Another aspect that highlights the significance of ICT is, It adds value to the learning processes and organization and administration of educational institutions. The internet is regarded as the powerful force that has rendered a significant contribution in promoting development and innovative practices. In the present existence, it has gained much prominence that individuals are regarding it

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as an integral aspect that facilitates the implementation of their job duties. When developments in technologies are taking place, it is vital to ensure that they prove to be advantageous to the individuals, organizations, communities and nation as a whole (Meenakshi, 2013).

Policy of ICT in Education

The significance of ICT in education has been given recognition not only in India, but in other countries of the world as well. The technology integration initiative was designed to provide support to schools in augmenting their technology infrastructure. The teaching skills initiative recognized that there was lesser emphasis in making use of computers in schools, unless the teachers were well-equipped with technical skills. When the teachers acquired training regarding technology and focused upon development of their skills, then emphasis was primarily put upon three major aspects. These are ICT skills and awareness, professional skills development in ICT and pedagogical skills development (ICT in Schools, 2008). Apart from development of these skills, it is vital for them to get engaged in regular practice to further reinforce their skills and aptitude. Getting engaged in regular practice to enhance technical skills applies not only to the teachers, but also to the students. There is a need to bring about improvements in the level of ICT infrastructure in schools, primarily in rural areas.

FACTORS INFLUENCING QUALITY OF EDUCATION THROUGH ICT

When implementing measures to promote quality of education through ICT, there are certain aspects, which need to be taken into account. These have been stated as follows:

Defining Learning Objectives – The educational institutions at all levels have certain learning goals and objectives, which they aspire to achieve. One of the primary learning objectives of educational institutions is to ensure that teaching and learning processes are organized in such a manner that they may lead to effective growth and development of students. The students are able to augment their knowledge and understanding in such a manner that they are able to successfully accomplish personal and professional goals. The effectiveness of teaching-learning methods and educational programs can be assessed, within the framework of learning goals, which are defined as particular knowledge, skills, abilities and behavioural traits that individuals should possess.

Managerial Functions – Within the educational institutions, the individuals need to possess adequate knowledge, skills and abilities regarding the managerial functions. The important managerial functions, which are implemented include, planning, organizing, directing, staffing, co-ordinating and controlling. When ICT needs to be integrated to make improvements in the quality of education, then the individuals need to plan number of methods and approaches. Organizing promotes organizing tasks and activities in accordance to the requirements. Directing is in terms of directing the activities and functions that are in accordance to the educational goals and objectives. Staffing is referred to selection and recruitment of trained, qualified and experienced individuals. These individuals should be able to acquire an efficient understanding regarding performance of job duties. Co-ordinating is referred to co-ordination of various tasks, approaches and programs. Controlling is a term that is used regarding controlling of resources and maintenance of amiable working environmental conditions. One needs to ensure that resources are made use of in an appropriate and well-organized manner.

Leadership Skills – When ICT is being integrated within the curriculum and instructional methods, then the teachers and principals are required to work in collaboration and integration with

each other. Meetings are organized, in which they discuss the matters and give each other ideas and suggestions. The principals and directors act as leaders. It is their job to ensure that teachers as well as the administrative staff members are well-equipped and make use of technology in a well-organized manner. They even organize workshops and training programs for the teachers and staff, so they are able to augment their knowledge and understanding. After the teachers have acquired adequate knowledge, they are required to implement it within the teaching-learning methods and instructional strategies. They need to ensure that technologies can be made use of in an operative manner to enhance student learning and help them achieve their goals and objectives.

Decision Making Processes – Decision making processes are regarded as an integral part of organizations and educational institutions. When the individuals are introducing ICT and other modern, scientific and innovative methods to bring about improvements in the quality of education, then they need to ensure that productive decisions are made, which would prove to be beneficial towards all the members. The individuals need to evaluate various alternatives available and then make the decisions, which would be beneficial to the students to a major extent. Within the educational institutions, there are different types of technologies which are made use of. Hence, when the authorities are participating in the decision making processes, they need to take into account various factors. These are, age groups of students, learning abilities, subjects, financial resources and overall environmental conditions.

Working Environmental Conditions – The working environmental conditions are considered important, particularly when any measures need to be formulated to bring about improvements. In some educational institutions, space is available to a large extent, i.e. there are large number of classrooms, several computer centres, and library facilities. Therefore, in such educational institutions, it is vital to implement ICT. For instance, when library facilities are large, then it is vital to ensure that computers are available. This usually applies to colleges and universities. On the other hand, in nursery schools, particularly the ones, which are not large, and comprise of just one or two classrooms, in such schools, the use of ICT is recognized to a limited extent. When the staff members would not be available and working environmental conditions would not make provision of enough space, in such schools, the use of ICT is recognized to a limited extent.

School Resources – The availability of school resources are regarded to be of utmost significance. As it has been understood, when the educational institutions are likely to put into practice, modern and innovative techniques and methods, or make use of technology, then, financial resources and human resources are the ones, which are considered vital. Financial resources are vital in enabling the individuals to determine new practices and approaches that they would introduce in enhancing the overall system of education. The other resources are human resources. The human resources are referred to the members of the educational institutions that need to possess the necessary skills and abilities that are required to perform their job duties in a well-organized manner. When human resources are not available to carry out the necessary functions, then advertisements are given regarding openings either on the websites or in newspapers and magazines. Suitable candidates need to apply for jobs and then selections are made, taking into consideration, number of factors, such as, their educational qualifications, competencies, abilities, job duties and so forth.

School Context – Within the school context, there are number of factors, which are required to be taken into account, which influence quality of education through ICT. These factors include, school location, size, number of classrooms, number of students, teachers and staff members, average

pupil socio-economic status and the overall environmental conditions. When ICT is being put into operation, then the members of the educational institutions need to ensure that these factors do not get effected in a negative manner. The teachers should possess efficient skills and abilities, so they are able to make operative use of ICT in enriching the teaching-learning methods and instructional strategies. When students are making use of technologies in their assignments and projects, then they need to get engaged in regular practice, so they are able to augment their skills and abilities and achieve academic goals.

School Process – Within the school process, the number of factors that need to be taken into account are, facilities, procedures and teacher characteristics. For instance, in schools, where adequate library facilities are not available, where not much emphasis is put upon the usage of technology, where proper infrastructure, facilities and other equipment is not available, in such schools, use of ICT would not be worthwhile. These schools are primarily located in rural communities. On the other hand, in urban communities, schools are well-developed and are making use of ICT within the teaching-learning methods, instructional strategies, administrative and clerical job duties and so forth.

Improved Understanding of the Subject – Academic learning is not easy. The teachers and students need to work diligently and resourcefully and put into practice the teaching and learning methods in an appropriate manner. Through the use of ICT in the teaching-learning methods and instructional strategies, the students are able to acquire an enhanced understanding of the subject. Through the use of internet, they are able to augment their understanding in terms of various concepts and even observe pictures and images. On internet, when one searches a particular topic, one is able to obtain access to numerous articles. Hence, in this manner, they are able to acquire an efficient understanding of the subject as well as prepare their assignments and projects in a satisfactory manner.

Increase in Interaction and Teamwork – The individuals are able to promote an increase in interaction and teamwork, when quality of education, as well as other tasks and activities are put into operation through the use of ICT. Before the advent of technology, when one made use of books and articles in the preparation of an assignment, then they usually worked independently and there was a decline in interaction and teamwork. But with the advent of technologies, individuals are bringing about improvements in their communication skills and promoting interaction and teamwork. When individuals are making use of technologies and working on projects, then they develop mutual understanding and work in collaboration and integration with each other. Research has indicated that more than six individuals make use of technology and work in collaboration with each other. Therefore, in this manner, ICT promotes increase in interaction and teamwork.

ROLE OF ICT IN IMPROVING QUALITY OF EDUCATION

The role of ICT in bringing about improvements in the quality of education has been regarded as vital in terms of students, teachers and non-teaching staff and parents. These have been stated as follows:

Students

When students are making use of ICT in acquiring an efficient understanding of the academic concepts, preparing their projects and assignments and in the achievement of academic goals, then they are able to generate the desired outcomes and recognise the significance of technology. When they do not have access to books, articles or other reading materials, then they make use of technology and internet. When students are working on a research paper, then they are able to obtain access to

adequate information through the internet. In this manner, they are able to complete their projects and assignments in less time consuming and manageable manner. Students, who are making use of voice communication aid is able to acquire confidence and social credibility skills within the educational institutions (Patra, 2014). Through the use of ICT, not only students, but also other individuals are able to augment their communication skills. The main type of communication that gets enriched through the use of ICT is written communication. Individuals are able to communicate with each other through emails and messages.

When students learn how to make use of internet, they tend to make use of it, not only to augment their skills and abilities in terms of academic learning, but also regarding other aspects. These include, listening to music, watching movies and other shows, playing games, reading stories and other articles, observing pictures and images of various objects, places and so forth. The students in higher educational institutions are making use of internet to look up jobs and other opportunities to enhance their career prospects. In this manner, the use of internet is commonly used for all purposes. When the students as well as other members of the educational institutions learn how to make use of internet, they are able to meet their job requirements in an appropriate manner. When the computers are used by the students, then they are likely to gain more independence in completing their tasks and assignments. Whereas, when they do not have access to internet and technology, then there is an increase in dependence of students upon others. Which may include, teachers, fellow students, or family members.

In educational institutions at all levels, there are students with learning disabilities and other problems. The problems and challenges that are experienced by students include, visual impairments, hearing impairments, speech impairments and so forth. When these students formulate the measures that are needed to pursue their educational goals, then their parents as well as teachers in schools make provision of necessary facilities and technologies, which would render a significant contribution in helping them to achieve their educational goals. In other words, technologies render an important contribution in helping the individuals with learning disabilities to implement their assignments in an appropriate manner. In educational institutions, the students, who are visually impaired access the internet along with their sighted peers (Patra, 2014). In this manner, they are able to receive adequate assistance from their fellow students in acquiring an efficient understanding of the concepts.

Teachers and Non-Teaching Staff

The teachers make use of ICT for number of purposes. They make use of the internet to augment their understanding and generate awareness in terms of academic subjects and concepts. In this manner, they would perform their job duties in a satisfactory manner. Another aspect is, they are able to facilitate the tasks of research and writing in an effective manner. As research and writing are regarded as integral aspects of teachers employed within all levels of educational institutions. When the teachers make use of ICT gadgets in their lectures, then they are able to enhance their lectures and promote better understanding of the concepts among students. Furthermore, through the use of ICT in lectures and class discussions, students are able to develop interest and motivation towards learning.

In some cases, teachers possess an introvert nature and do not get engaged in interaction with others. They primarily focus upon the performance of their job duties and do not establish effective communication terms with others. Through the use of technology, they are able to augment their communication skills and establish good terms and relationships with other members within their

workplace. One cannot work towards the achievement of desired goals and objectives in isolation. It is of utmost significance for the individuals to develop good terms and relationships with others and work in integration and collaboration. Normally the teachers, who are above 50 years of age, do not possess adequate skills and abilities in terms of usage of technology. They lack the understanding in terms of sending emails. Hence, use of technology helps in augmenting technical skills among teachers, belonging to all age groups and backgrounds.

The non-teaching staff make use of ICT on a comprehensive scale to implement the necessary jobs and functions. In the implementation of administrative, governance and managerial functions, the individuals make use of various types of technologies. These include, computers, lap-tops, printers, photocopiers, mobile phones and so forth. The non-teaching staff members are required to carry out numerous job duties. Some of the important ones include, maintenance of records, preparing letters, notices, and other documents. When there is organization of any speeches, presentations or talks within the departments or schools, then they disseminate information through emails. When seminars, conferences or workshops are organized, then the administrative staff members are required to prepare the schedule, brochures and carry out other tasks, as told by heads, or directors or principals. When a new course or program is coming into existence, then they are required to prepare the schedule. Hence, it can be stated that when the staff members are to carry out these functions, then they need to make use of technologies and possess the necessary information and aptitudes.

Parents

The parents ensure that growth and development of their children takes place in an appropriate manner. For this purpose, they aspire to give good-quality education to their children and get them enrolled in schools. The individuals, belonging to all categories and backgrounds have recognized the significance of education. They have generated awareness in terms of the fact that acquisition of good-quality education would enable the children to establish a foundation to lead to effective growth and progression. Apart from acquisition of education, the parents tend to inculcate the traits of morality and ethics within their children, so they are able to communicate with others well, develop mutual understanding and good terms and relationships with others in educational institutions and achieve their desired goals and objectives. When the parents are imparting essential information to their children, then it is vital on their part to understand and implement these traits in an efficient manner.

When ICT is made use of in improving the quality of education in schools and higher educational institutions. Then the teachers ensure that students make use of it to prepare their homework assignments, projects and so forth. When the students need to prepare themselves for competitions, tests or exams, then too, they are required to make use of ICT, particularly to enhance their understanding in terms of the concepts. Hence, to achieve the academic objectives, it is the responsibility of the parents to make provision of technology and internet connection at home. When the students have these facilities available within their homes, then they do not have to be concerned regarding making visits to the computer centres. They are able to overcome problems and challenges that are associated with the achievement of academic goals and objectives.

In some cases, when the parents, especially mothers, who are well-educated and are not employed, teach their children. When they are teaching their children, belonging to nursery schools, elementary schools, secondary schools or senior secondary schools, then it is vital for them to possess adequate knowledge and information in terms of academic concepts. The students normally

obtain assistance from parents in imparting assistance to them in completion of their homework assignments, preparing them for the exams and competitions and acquiring an efficient understanding in terms of the concepts. The parents, who are providing assistance to their children in terms of these aspects, make use of technology to prepare them-selves and augment their skills. In some cases, private tutors are hired to assist students. In such cases, they too make use of technology to provide training in terms of various subjects and lesson plans. Hence, students are able to achieve their academic goals, when ICT is available within homes.

CONCLUSION

The use of ICT has rendered a significant contribution in bringing about improvements in the system of education in numerous ways. The members of the educational institutions are not only able to enhance their knowledge and understanding in terms of number of aspects, but also are able to carry out the tasks and activities in an operative manner. In other words, with the possession of skills and abilities, the implementation of tasks and activities become more manageable. The benefits of ICT in education are recognized in terms of various aspects. These are, teaching-learning processes, quality and accessibility of education, learning environment, learning motivation and scholastic performance. When the members of the educational institutions are well-equipped in terms of usage of technology, then they are able to bring about improvements in teaching-learning processes, quality and accessibility of education, learning environmental conditions and scholastic performance. Furthermore, students become motivated towards learning and work effectively towards achievement of academic goals.

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18

THE IMPORTANCE OF ICT IN HIGHER EDUCATION

*Dr. Kusum Lata**

Education is a socially oriented activity. The quality education has traditionally been associated with strong teachers having high degree of personal contact with their students. Today Information and Communication Technologies (ICT) have become Common place entities in all aspects of life. Across the past twenty years the use of ICT has fundamentally changed the practices and procedures of nearly all forms of Endeavour within business and governance. Within education, ICT has begun to have a presence but the impact has not been as extensive as in other fields. Education is a very socially oriented activity and quality education has traditionally been associated with strong teachers having high degrees of personal contact with learners. The use of ICT in education lends itself to more student-cantered learning settings and often this creates some tensions for some teachers and students. But with the world moving rapidly into digital media and information, the role of ICT in education is becoming more and more important and its importance will continue to grow and develop in the 21'st century. The Government of India has announced 2010-2020 as a decade of innovation. In this paper attempts are made to highlight the major initiatives in Higher Education, its advantages and challenges. Some recommendations are also discussed.

Key-Words: *Online learning, constructivism, higher education, ICT Initiatives.*

OBJECTIVES

- To explore the general perceptions of l students and faculties about the role of Information Communication Technology in higher education;
- To gauge student's dependence on the same for seeking knowledge and information.

INTRODUCTION

According to Dr. Babasaheb Ambedkar (Bombay, Legislative council Debate, 27 July, 1927), "The university is a machinery whereby education facilities are provided to all those who are intellectually capable of using those facilities to be the best advantages but who cannot avail themselves of those facilities for want of funds or for other handicaps in life". The people in university education shape the behavior; minds and the social and human values of the student community .Effective use of technology can motivate students, make our classes more dynamic and interesting and renew teacher enthusiasm as they learn new skills and techniques. Technology is also helping the students to understand any abstract concepts clearly.ICT has become an integral part of today's teaching learning process. The integration of ICTs in teaching in general and teacher education in particular

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is the need of the day. The use of ICTs can make substantial changes both for teaching and training mainly in two ways; **firstly;** the rich representation of information changes learner's perception and understanding of the context. **Secondly;** the vast distribution and easy process access to information can change relationships between teachers and taught.ICT can also provide powerful support for educational innovation. In the last few decades, we have seen an increasing number of youngsters gaining access to higher education .This phenomenon reflects a trend at a global level ,which is largely due to the democratization and development of societies, the improvement of living conditions and structures ,the demand for a more highly qualified performance both in professions and citizenships we have, therefore witnessed a change both in terms of quality as well as quality in the student population ,reflected in the gradual loss of the elitist and formal character of higher education through the admission of individuals from all social classes(Soares and Almeida,2002). "The emancipator and transformative potentials of the ICT in higher education in India has helped increase the country's requirement of higher education through part- time and distance learning schemes. It can be used as a tool to overcome the issues of cost, less number of teachers and poor quality of education as well as overcome time and distance barriers."(MC Gorry, 2002)

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 broadcast programs contributed by institution such as IGNOU and IITs. Under the UGC country wise classroom initiative, 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 ecofriendly solutions to local problems.

ADVANTAGES OF AN 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 Factors:** 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 Material: 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.

Student's benefits of ICT education are:

Increased access,
Flexibility of content and delivery,
Combination of work and education,
Learner-centered approach,
Higher-quality of education and new-ways of interaction.

Employer's benefits of ICT education are:

High quality, cost effective professional development in the workplace,
Upgrading of employee skills, increased productivity,
Developing of a new learning culture,
Sharing of costs and of training time with the employees,
Increased portability of training.

Government's benefits of ICT education are:

Increase the capacity and cost effectiveness of education and training systems,
To reach target groups with limited access to conventional education and training,
To support and enhance the quality and relevance of existing educational structures,
To ensure the connection of educational institutions and curricula to the emerging networks and information resources,
To promote innovation and opportunities for lifelong learning.

There are specific challenges for ICT-based education and learning. One of the major challenges to quality control in education is the lack of standards for parameters that measure the quality of education. To address this, all certification bodies, such as NAAC, NBA, AICTE, CBSE and other organizations, must jointly distribute a list of standard parameters to determine the quality of education. The development of ICT has changed the epic knowledge center and in many cases the student gets more information than the teacher. Teachers have insufficient qualifications and education and curricula are often outdated or inadequate. Installing an ICT device can be cumbersome. It is economically significant that teachers cannot use ICT tools because of their lack of experience. For this reason, the available quality of education is destroyed. Distance learning through ICT can largely solve this problem. One of the main obstacles is the lack of skilled teachers who can use IT skillfully. Most teachers do not first want to introduce new technology to themselves, and then students Teachers need to update their knowledge and skills as a curriculum and technological change

CHALLENGES OF ICT IN HIGHER EDUCATION

First is the high cost of acquiring, installing, operating, maintaining and replacing 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. Using unlicensed software can be very problematic, not only legally but in the costs of maintenance, particularly if the pirated software varies in standard formats. Even though students can benefit immensely from well-produced learning resources, online teaching has its own unique challenges as not all faculties are ICT literate and can teach using ICT tools. The four most common mistakes in introducing ICTs into teaching are:

(i) Installing learning technology without reviewing student needs and content availability;
(ii) Imposing technological systems from the top down without involving faculty and students;
(iii) Using inappropriate content from other regions of the world without customizing it appropriately;
(iv) Producing low quality content that has poor instructional design and is not adapted to the technology in use.

The other challenge faced is that in many colleges the basic requirement of electricity and telephone networks is not available. Also many collages do not have proper rooms or buildings so as to accommodate the technology. Another challenge is that the teachers need to develop their own capacity so as to efficiently make use of the different ICTs in different situations. They should not be scared that ICTs would replace teachers English being the dominant language most of the online content is in English. This causes problems as in many rural areas the people are not conversant or comfortable with English. Skills development is another important area in which ICT could be used effectively. Attempts are being made to strengthen the ICT framework for Technical and Vocational Education (TVET). The emerging discourse on the role of skill development in addressing poverty and developmental issues indicates the potential role of ICT4D. ICT can play a major role in integrating skill development as a component of a poverty alleviation strategy

SOME RECOMMENDATIONS

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, through computer apprentices courses taught in vigerian tertiary institutions. In this period of economic recession, the price of ICT equipment and materials will continue to the astronomical. It becomes highly imperative for all stakeholders of education to entice industrial establishments, politicians, big businessman and entrepreneurs, non-governmental organizations and the community at large to assist the institutions in the provision of ICT equipment and materials and well finished computer laboratories.

CONCLUSION

The adoption and use of ICTs in education have a positive impact on teaching, learning, and

research. The quality of education through awareness among ICT and stakeholders will positively influence society. ICT can help with the quality and standards of education. ICT can be hired for both formal and informal forms of education and will ultimately make the pupil a viable and socially useful part of society. 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. It can influence the way students are taught and how they learn. It would provide the rich environment and motivation for teaching learning process which seems to have a profound impact on the process of learning in education by offering new possibilities for learners and teachers. These possibilities can have an impact on student performance and achievement. Similarly wider availability of best practices and best course material in education, which can be shared by means of ICT, can foster better teaching and improved academic achievement of students. 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. Thus ICT in Higher education improves teaching learning process, provides the facility of online learning to thousands to thousands of learners who cannot avail the benefits of higher education due to several checks, such a time, cost, geographical location etc. Once again ICT serve to provide the means for much of this activity to realize the potential it holds.

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ROLE OF DIGITAL LEARNING IN EDUCATION

*Dr. Raj Kumari**

Many reasons justify the relentless focus on learning. Most generally, as knowledge has become central to economies and societies, the spotlight has necessarily shifted to learning – without it, information cannot become usable, actionable knowledge. The enormous potential of technology also invites the rethinking of learning and teaching possibilities. In this ever-growing digital age e-Learning, digital classrooms are coming up rapidly in all streams around the world, and the learners are eagerly filling up the seats. The present paper presents the components of digital learning and how digital learning can be used in the classroom.

INTRODUCTION

Digital learning environments is a term that refers to the total of digital resources (computers, software, storage, software, and systems) used to manage an academic enterprise and support, enable or manage learning. Digital learning is any type of learning that is accompanied by technology or by instructional practice that makes effective use of technology. It encompasses the application of a wide spectrum of practices including: blended and virtual learning. Digital Learning is "learning facilitated by technology that gives students some element of control over time, place, path and/or pace.

THE COMPONENTS OF A DIGITAL LEARNING ENVIRONMENT

- **A Sense of Community:**In the digital environment,teacher knows the interests, strengths, and challenges of their student. Teachers in the digital age must encourage appropriate netiquette and the responsible use of technology tools and resources.
- **Essential Questions:**Teachers should design lessons or units of study within the digital learning environment by posing essential, open-ended questions. As teachers frame learning experiences around the questions, they promote a stimulating culture of inquiry and innovation.
- **Captivating Digital Content:**Students need access to rich multimedia content, including primary resources and documents in a digital learning environment. By utilizing a learning object repository, teachers and students can access resources as well as upload and share the content they create within their learning activities.
- **Assessment for Learning:** The teacher in the digital learning environment employs assessment for learning. Teachers also use multiple forms of assessment in the process of learning

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so that students have more ways to experience success. These forms may include participation in discussion and multimedia presentations.

- **Multiple Technology Tools:**Different resources are also useful for different tasks. So, there may be a situation when a smart phone or a tablet is the appropriate tool for taking a photo, responding to a question, or accessing content, but other situations may require the use of a laptop or desktop computer, broadcast equipment, interactive whiteboard, or 3D printer. Learning when and how to use the right tool for a job are essential functions within the digital age learning ecosystem.
- **Designs for Differentiation and Accessibility:**As each student is unique and has different strengths and challenges, so their learning experiences should be tailored for those personal differences.
- **Supportive Classroom Environment:** The classroom environment of the digital learning activities includes both the physical and online areas that are used by the teacher and students.
- **Engaging Instructional Strategies:** In digital age teachers consider how they implement instructional strategies and realize that they can facilitate student learning without everyone doing the same thing, at the same time, and in the same way.

BENEFITS OF DIGITAL LEARNING

The inclusion of digital learning in the classrooms can vary from simply using tablets instead of paper to using elaborate software programs and equipment as opposed to the simple pen. Digital Technology is revolutionizing the face of education on a global scale.

- **Developing Independent Learning Interests in Students:** One of the first easy observations regarding digital technology and education is that online schools and classes are becoming widely available and are gaining popularity. The internet is a treasure trove of information as anything you need to know can be found online. Inspite, the credibility of the source and the data provided is under question, it can still serve as an educational resource for students. Students can look up their lessons online without any assistance from parents and teachers. Unlike regular textbooks, the online contents are updated in real time, feeding students with the most current information they can get their hands on.
- **Prepares Students for The Future:** From the way technological advancements are going, it is obvious that the future will be digital and technology-focused. If students are well-versed on using technology to collaborate and communicate as early as now, they will not have trouble fitting in, competing and finding jobs in the future. Being familiar with using at least one form of technology at an early age will help them become comfortable using it, and eventually develop other skills necessary to handle other innovative devices and processes.
- **Learning Texts Are Now Digitalized**: Nowadays, learning is going online. and the textbooks are slowly being replaced with iPads and various forms of devices connected to online media.
- **Guidance and Instruction from Diverse Teachers:** The increase of digital technology has also affected the availability and access to diverse teachers and instructors for students around the world. Teachers from different backgrounds and countries all bring their own unique perspectives, cultures, and languages to the table of learning.
- **Collaboration and Peer-To-Peer Learning In The Classroom:** With an increase in access to online learning, the instructions are being provided online that also increases the opportunities

for students to collaborate together from a variety of places. Diverse student bodies also increase diversity in ways of thinking and contributions to class discussions and projects. Inside and outside the classroom students can work together through online platforms and portals to exchange ideas. Teachers are encouraging and setting up classrooms that inspire and sometimes require peer-to-peer discussions.

- **Data Driven Instructions and Results:** Another change that is occurring due to the rise of digital technology is the increase in data-driven instruction and results. Although some teachers are being forced to use online grading tools and devices, analysis tools are also becoming more precise. These devices and grading tools can provide more accurate results regarding student performance, but can also result in a teacher's limited ability to judge a student's performance based on the content of their writing, classroom performance, and other contributions.

WAYS TO BRING DIGITAL LEARNING INTO CLASSROOM

Digital learning has completely changed the landscape of education. There are so many ways that high-tech ideas can enhance and contribute to a classroom that the options are endless. As a teacher, you have access to improvements that can help students learn in bright new ways.

Innovative and engaging digital learning environments are not only the new model to follow, but they're the wave of future learning as well. You can transform your classroom using unique strategies like these that focus on digital learning and interaction. Most of these ideas can be scaled up or down for higher or lower grade levels depending on the learners you're teaching. Here are 7 ways to make your classroom into a digital learning playground.

- **Get an Interactive Whiteboard**

— This is a modern digital learning piece of equipment that is absolutely essential for any tech-savvy classroom today. Whiteboards are the cornerstone of digital learning practice. Usually, the whiteboard will come with a presentation.

- **Start A Student-Run Blog for The Class**

— Projector for even more ease in setting up lectures and

— Another idea to incorporate modern learning is setting up a blog for the classroom that's student-run. You can go a step further and have them also work on a website for your class. Build the site from start to finish for a real-world skill in digital learning that will come in handy for their future. As far as the blog goes, have your students assigned a posting schedule each week, so that everyone gets their turn to contribute to the blog. You can easily make this a part of the classroom's engagement all year long.

- **Multi-Media Presentations**

— With a tablet, Chromebook, or laptop you can have students learn how to give multimedia presentations like PowerPoint or Google Doc Slides for Chromebook in a whole new way. These types of digital media presentations are much more modern than the old "poster board and marker" route students used to have to employ for showcasing their projects in front of the class.

- **Smartphone Video Projects**

— Smartphones have many uses in the digital learning playground, and making video projects with them is perfect for this environment. A classroom tablet is easy to do this with as a filming device, but most students have their own smartphones to work on this project.

With all different kinds of subject matter, you can have students film commercials, programs, newscasts, and other types of video projects, and even short films they create themselves. There are also programs that help them edit and produce their work in a more professional way that is easy to learn.

- **Create A Classroom Podcast**

— Another digital learning idea is to create a classroom podcast. You can centre the subject matter around anything that you are learning, but history and science topics make great ideas for podcasts. Book discussions on language arts topics are also great to explore. On the other side, you can also have students listen to current podcasts that correspond with things they are learning.

- **Skype A Speaker into The Classroom**

— Skype is a great way to connect with digital learning overseas. You can even have speakers contribute to classroom talks by interacting with them online through Skype. Some great guest speakers can enhance the learning process by really getting the students interested in topics that seem flat on paper. They come alive with the right speaker to spark their interest.

- **Field Trip Without Leaving the Classroom**

— Through digital learning, students can explore places they might not have a chance to normally go to. A field trip without leaving the classroom is a great way to experience this idea.. Students can hook up their own smartphones or ones that you use in the classroom to experience this amazing program for digital learning through virtual reality.

— Having a digital learning model in the classroom will not only make your students more comfortable and familiar with technology, but since they are so naturally great with all things digital it can engage them in a way that makes learning even more fun for them.

- **Enhancing Effective Digital Learning**

— Digital learning can be made extremely productive by using the following basics:

- **Relating Digital Learning to Offline Learning**

— When a student is able to connect and relate what he studies in the classroom with what he learns online through digital classes, it improves his/her level of understanding and helps in grasping engineering concepts easily. Creating this co-relation makes digital learning a relevant and rewarding experience for the student. For example, to study a mechanical engineering e-Learning lecture, the student will require a recap of the topics studies previously to be on the same page. This process ensures better comprehension of crucial concepts.

- **Learning Practical Application of Knowledge**

— In engineering, if the knowledge is not applied practically, cramming up a lot of theory may become tedious and unproductive. Hence it is imperative to know practical applications of the topics being studied. An effective way to do this is to include real-life demonstrations, scenarios and artificial simulations coupled with the theoretical concepts. This would provide a complete and thorough understanding of the subject for the student. An exhaustive digital learning engineering course where along with the right applications can ensure effective learning for any engineering student.

- **Getting Continuous Feedback and Analysis of Progress**

— e-Learning programs for engineering come with assessments and tests that help students in assessing their knowledge and tracking their learning progress. The platforms also provide students with a feedback section where they are encouraged to add their suggestions, grievances or any other feedback that would help in making the e-Learning platform better. This sort of an ecosystem is very advantageous to students in the long run as gradually the digital learning platform adapts to their specific needs.

- **Enabling Social Engagements**

— One of the biggest advantages of e-Learning platforms is that they allow engineering students to socialize, collaborate and interact with fellow learners on the web. Students can work together, pool in their resources, study together and share milestones while working towards a common goal. Moreover, students can leverage this feature to engage and experience a higher level of group learning.

- **Learning Through a Mixed Approach**

— Research shows that custom-designed, mixed programs tend to enhance the knowledge retention power and learning skills of students. Digital learning courses can be clubbed with other learning mediums like videos, podcasts and even multimedia courses to improve their learning curve.

HOW DIGITAL LEARNING IS HELPING TO STRENGTHEN THE EDUCATION SYSTEM

Vast technological advancements have been made possible with the support of education as the main driving force. Digital learning has proven to be beneficial in several significant ways:

- **It Has Made Education Infrastructure More Robust:** In some areas where classroom education has not been effective, digital learning has offered great benefits to students. Nowadays, most reputed schools and colleges around the globe have incorporated learning in their curriculum. Many engineering colleges have turned to smart-classrooms, where students are taught using advanced eLearning tools. This kind of pedagogy has made it easy to teach complicated concepts to students by using 3D animation and graphics where the learner actually experiences the practical scientific process.

- **It Has Given A Competitive Edge To Engineering/Technology Students:** It has given a competitive edge to students who are studying engineering or technology that not only needs classroom training but also requires practical application and expertise. Most e-Learning portals nowadays offer online courses, covering both the theoretical and practical aspects of different subjects. Such tools and technology have taken engineering education to the next level where students can study any subject at their convenient time and pace.

- **Digital Learning Has Also Proven To Be A Superb Tool For Transferring Knowledge And Upgrading Skills:** It is a very flexible medium for studying sitting in the comfort of one's own room. Students can now study, experience, test their learning through self-assessment and even keep a track of their progress and milestones.

- **The Digital Medium Has Also Been Ideal For Corporate Training:** The online learning platforms are portable, efficient, flexible and robust mechanisms. Corporate companies have now started using digital learning tools extensively to train their employees, help them upgrade

their skills and provide seamless sessions for knowledge transfer.

To sum it up, digital learning puts the entire power in the hand of the students. They can control what they wish to study and when, that has led to better performance and results, thus strengthening the education system and its objectives.

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ROLE OF ICT IN HIGHER EDUCATION

*Ridhu Saini**

Education is a very socially oriented activity and quality education has traditionally been associated with strong teachers having high degrees of personal contact with learners.ICT has become an integral part of today's teaching learning process. Effective use of technology can motivate students, make our classes more dynamic and interesting and renew teacher enthusiasm as they learn new skills and techniques. The role of ICT in higher education is becoming more and more important and this importance will continue to grow and develop in 21st century. The use of ICT in education not only improves classroom teaching learning process, but also provides the facility of e-learning. The adoption and use of ICTs in education have a positive impact teaching, learning and research. The use of ICT will not only enhance learning environment but also prepare next generation for future lives and careers .This paper highlight the various impacts of ICT on higher education and explores various potential future developments.

***Keywords**:-Information and Communication Technology, ICT initiatives, Higher Education*

INTRODUCTION

According to Dr. Babasaheb Ambedkar (Bombay ,Legislative council Debate,27 july,1927), "The university is a machinery whereby education facilities are provided to all those who are intellectually capable of using those facilities to be the best advantages but who cannot avail themselves of those facilities for want of funds or for other handicaps in life". The people in university education shape the behavior; minds and the social and human values of the student community .Effective use of technology can motivate students, make our classes more dynamic and interesting and renew teacher enthusiasm as they learn new skills and techniques. Technology is also helping the students to understand any abstract concepts clearly.ICT has become an integral part of today's teaching learning process. The integration of ICTs in teaching in general and teacher education in particular is the need of the day. The use of ICTs can make substantial changes both for teaching and training mainly in two ways; firstly, the rich representation of information changes learner's perception and understanding of the context. Secondly; the vast distribution and easy process access to information can change relationships between teachers and taught.ICT can also provide powerful support for educational innovation. In the last few decades, we have seen an increasing number of youngsters gaining access to higher education .This phenomenon reflects a trend at a global level ,which is largely due to the democratisation and development of societies, the improvement of living conditions and structures ,the demand for a more highly qualified performance both in professions and citizenships

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we have, therefore witnessed a change both in terms of quality as well as quality in the student population ,reflected in the gradual loss of the elitist and formal character of higher education through the admission of individuals from all social classes(Soares and Almeida,2002).

REVIEW OF RELATED LITERATURE

Ozdmemir and Abrevaya (2007) asserted that ICT is reducing the cost per students and expanding the enrolments and makes the provisions for employers and supports enduring learners. Lalitbhushan S Waghmare, et-al (2014) studied "Role of Information and communication technology in Higher education: learners perspective in rural medical schools".They concluded that there is a need to foresee the role of technology in education and take appropriate measures to equip the stakeholders for adequate and optimum application of the same. Uttam kr Pegu studied "Information and communication technology in higher education in India: challenges and opportunities" (2014). The study revealed that ICT enabled education will ultimately lead to the democratization of education and it has the potential for transforming higher education in India. Mahisa, Anju studied "The role of ICT in higher education in India" (2014) .The study revealed that ICT play vital role as a strong agent for change among many educational practices.

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.

RECOMMENDATIONS

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, through computer apprentices courses taught in vigerian tertiary institutions. In this period of economic recession, the price of ICT equipment and materials will continue to the astronomical. It becomes highly imperative for all stakeholders of education to entice industrial establishments, politicians, big businessman and entrepreneurs, non-governmental organizations and the community at large to assist the institutions in the provision of ICT equipment and materials and well finished computer laboratories.

CONCLUSION

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. Thus ICT in Higher education improves teaching learning process, provides the facility of online learning to thousands to thousands of learners who cannot avail the benefits of higher education due to several checks, such a time, cost, geographical location etc. Once again ICT serve to provide the means for much of this activity to realize the potential it holds.

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EMERGING TRENDS IN ICT FOR EDUCATION & TRAINING

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Technology has changed due to modernization as a whole. It has also changed the pattern of teaching and learning which enhance the skills of individual learner and teacher. The power and diversity of information transfer allow teachers and students to have access to the world beyond the classroom.We will have to make use of the rich and exciting opportunities offered by the new technologies in education to reach our training goal and mission. One of the objectives of the present paper is to provide better understanding and appreciation of the role of ICT in teaching and learning system.This paper shows the teacher professional development in the use of interactive technology should embody and model the forms of pedagogy that teacher can use themselves in their classroom.

Key Word:- *technology, teacher, information, communication, learning.*

INTRODUCTION

During the past few years, the world has witnessed a phenomenal growth in communication technology, computer network and information technology. Development of new broadband communication services and convergence of telecommunication with computers have created numerous possibilities to use a variety of new technology tools for teaching and learning system. The integration of computers and communications offers unprecedented opportunities to the education systems with its capacity to integrate, enhance and interact with each other over a wide geographic distance in a meaningful way to achieve the learning objectives. The growth of these communication and computer systems, their ease of use, the power and diversity of information transfer allow teachers and students to have access to a world beyond the classroom. It has the potential to transform the nature and process of the learning environment and envision a new learning culture. Interactivity, flexibility and convenience have become the order of the day in the ICT supported environment. ICT opens up opportunities for learning because it enables learners to access, extend, transform and share ideas and information in multi-modal communication styles and format. It helps the learner to share learning resources and spaces, promote learner centered and collaborative learning principles and enhance critical thinking, creative thinking and problem solving skills. Not only mastering ICT skills, but also utilizing ICT to improve teaching and learning is of utmost importance for teachers in performing their role of creators of pedagogical environments. While literature provides some evidence of the effectiveness of using ICT in technical considerations, little is known about

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which learning strategies and pedagogical framework should be used for education and training. How to construct these electronic teaching and learning environments so that they are based on specific epistemologies or knowledge bases? What will be the new vision and guiding principles of teacher development for pedagogytechnology integration? As we become increasingly supported by ICT, teaching and learning will not be the same as before. We will have to make use of the rich and exciting opportunities offered by the new technologies in education to reach our new goal and vision. To appreciate the integration of ICT in teaching and learning, we need to understand the major paradigm shifts in education in recent years.

PARADIGM SHIFTS

Education around the world is experiencing major paradigm shifts in educational practices of teaching and learning under the umbrella of ICT enabled learning environment. Whereas learning through facts, drill and practices, rules and procedures was more adaptive in earlier days, learning through projects and problems, inquiry and design, discovery and invention, creativity and diversity, action and reflection is perhaps more fitting for the present times. The major hallmark of this learning transition is from teacher centered to learner focus paradigm. During the last three decades, the changes in educational environment have been phenomenal. The model, focus, role of the learner and technology has been changed drastically from traditional instruction to virtual learning environment as depicted below.

Changes in Teaching Learning Environment			
Modles	Focus	Role of Lerner	Technology
Tradetional	Teachers	Passive	Chalk & Talk
Information	Learners	Active	Personal computer
Knowladge	Group	Adaptive	Pc + Network

Engaging learning environment for teachers and learners. This new environment also involves a change in roles of both teachers and learners. The role of the teachers will change from knowledge transmitter to that of facilitator, knowledge navigator and sometime as co-learner. The new role of teachers demands a new way of thinking and understanding of the new vision of learning process. Learners will have more responsibilities of their own learning as they seek out, find, synthesize, and share their knowledge with others . ICT provides powerful tools to support the shift from teacher centred to learner centred paradigm and new roles of teacher, learner, curricula and new media. The major shifts have been described in a tabular form below.

Changes in Teacher's Role

Changes in Teacher's Role	
From	Role
Transmitter of Knowledge	Guide & facilitator of Knowledge
Controller of Learning	Creator of Learning Environment
Always Expert	Collaeborator and Co-learner
Learning to use ICT	Using ICT to Enhance Learning
Didactive/expository	Interactive/Experiantial/Exploratory

Changes in Learner's Role	
From	To
Passive Learner	Active Learner
Reproducer of Knowledge	Producer of Knowledge
Dependent Learner	Autonomus Learner
Soilatery Learner	Collaborative Learner

Changes in Circular Delivery	
From	To
Memorizing Facts	Inquiry Based
Artificial Teaching Experience	Authentic Learning
Rigid Delivery	Open & Flexible Delivery
Single Path Progression	Multi Path Progression

Changes in Media Applications	
From	To
Single sense Stimulation	Multi Sensory Stimulation
Single Media Application	Multi Media Application
Delivery of Information	Exchange of Information
Monologue Communication	Dilogue and Collaboration
Analogue Resources	Digital Resources

All these changes taking place in learning and teaching demand a new learning environment to effectively harness the power of ICT to improve learning. ICT has the potential to transform the nature of education: where, when, how and the way learning takes place. It will facilitate the emergence of responsible knowledge society emphasizing life long learning with meaningful and enjoyable learning experiences.

CREATING NEW CULTURES

The integration of ICT into the very idea of teaching and learning always places pedagogy over technology. It is not the only concern to master ICT skills, but rather it involves using ICT to improve teaching and learning. The major emphasis of ICT infusion in pedagogy should be such that it tends to improve learning, motivate and engage learners, promote collaboration, foster enquiry and exploration, and create a new learner centered learning culture. It permits the move from reproductive model of teaching and learning to an independent, autonomous learning model that promotes initiation, creativity and critical thinking with independent research. Learners are expected to collect, select, analyze, organize, extend, transform and present knowledge using ICT in authentic and active learning paradigm. Teachers are expected to create a new flexible and open learning environment with interactive, experiential and multimedia based delivery system. ICT should help teachers and learners to communicate and collaborate without boundaries, make learners autonomous and allow teachers to bring the whole world into classroom activities. It is ultimately important to understand the roles of ICT in promoting educational changes. A basic principle is that the use of ICT changes the distribution and ownership of information resources in the space of teaching and learning and thus changes the

relationship among educational participants. While designing any innovative teaching and learning environment using ICT, the teacher should always keep the learning at the center of all activities, pedagogy should be at the heart and integration of pedagogy-technology should be the central focus.

PEDAGOGICAL

Practices using ICT Mere learning ICT skills is not suffice, but using ICT to improve the teaching and learning is the key for pedagogy-technology integration. But the question is how we can combine these two. Consider a scenario of a young teacher who has just started to use ICT for his daily classroom activities of teaching and learning. To start with he or she needs to prepare lesson plans and compile lesson materials for the classroom lecture. To prepare such materials one has to go through the act of drafting phase, editing phase, revising phase and finally publishing the lesson plans and course contents. Word processor can be a great help to accomplish this task in a professional and productive way to avoid repetition, duplication of manual work and concentrate on quality of the course materials. The teachers also need to make lists of the name of the students for monitoring and recording their academic performance and to analyze and perform a statistical analysis to take some corrective measure if any, in the lesson plan, delivery of instruction. Spreadsheets can be a good choice for creating class lists, recording their performance and executing statistical analysis upon them. While delivering the class lectures, any innovative teacher needs to draw diagrams, show pictures, animate some objects to explain critical concepts, even play some video clipping of real time operation. All these multimedia applications can assure very productive, interesting, motivating, interactive and quality delivery of classroom instruction. Presentation software like power point can be a good choice for teachers for performing such tasks. In spite of the best efforts of teachers there will be a number of learners who will not be satisfied with the pace of instruction of the teachers. There may be a fast learner, average learner and slow learner. In a classroom environment it is impossible to satisfy all categories of learners with their specific learning styles. It is in these situations, teachers become helpless in a conventional teaching and learning environment. One way to solve such situations is to create interactive multimedia based instructional materials where learner is given control to review the topic at their own pace and in accordance to their individual interests, needs and cognitive processes. As such, multimedia courseware can be of great help to teachers to meet the challenges of such situation. With availability of user friendly authoring tools, it is now possible to develop multimedia courseware by any young teachers to support drill and practice to master basic skills, simulate complicated situations, produce individualized instruction with multimedia elements with built-in evaluation questions and scores. Such multimedia courseware can produce profound changes in the learning outcomes when it is being used along with face-to-face instruction. Learners always look for flexibility in time, space, place, content selection and delivery of instructions. It was quite impossible to satisfy such requirements in earlier times due to the non-availability of proper tools. It is now feasible and possible to implement open & flexible learning strategies using ICT as tools. Flexible access to content and learning resources via network across conventional class rooms, homes and community centers is the defining characteristic of what has come to be known also as distributed learning. Learning any time, anywhere with synchronous and asynchronous communication across space, time and pace is the key to web based instruction. With the availability of online tools, it is now possible to create content websites, online education to support and assist face to face instruction in an innovative way. Communication with e-mail, searching

for information, locating a proper website is now the key to success. Developing online and offline learning resources using various learning management system software/tools will become one of the key competencies of modern day teachers. Searching, locating and categorizing knowledge and information via internet has open a new vistas in implementation of flexible learning strategies. As such starting from the productivity software to specialized educational software, there are numerous examples of various applications of the ICT tools in the teaching and learning system. Therefore, preparation of teachers to face the challenges of an ICT enriched teaching and learning environment is crucial. First teachers need to be equipped with the fundamentals of ICT tools and sufficient understanding on the integration of these tools in teaching and learning and secondly efforts must be oriented towards changing mind set and developing positive attitudes towards ICT application in teaching and learning. Understanding the changing role of teachers from instructor to facilitators, teacher lead instruction to learner-centered instruction is the key for successful implementation of pedagogy-technology integration for teacher development. In designing learning materials using ICT productivity tools certain pedagogical principles needs to be considered carefully. Mere ICT tools by themselves do not make good pedagogy. The moot question is how should the learning environment is designed using ICT as tools? What pedagogical principles would take the advantages of the best practices and unique environment afforded by this new ICT tools. These were the central questions which needed to be addressed The use of ICT should satisfy the diverse needs of all kinds of learners characterized by all kinds of socio-cultural conditions including the diversity of multiple intelligences. Teachers should continue to learn through their lives new ways of using technology for the growth of their learners as well as the very systems of education. The critical question in education is- in what ways ICT can enhance learning and teaching practices. Broadly ICT tools help to open up opportunities for learning by enabling four major key processes in transforming teaching and learning as follows:

* Access ideas and information from diverse sources through searching, locating, selecting, and authenticating material in a wide range of multimedia forms; Extend ideas and information through processing, manipulating, analyzing & publishing material in different multimedia forms; Transform ideas and information into new or different forms through synthesizing, modeling, simulating and creating material in many multimedia styles and formats; and
* Share ideas and information across local, national and international networks by interacting electronically with others in actual and/or delayed time.
* Access, extend, transform and share represent key processes by which students learn and become independent learners and self-starters. Through the processes learners express their creativity and imagination. These processes can be applied in all areas of learning and in all levels of education. There are three broad categories of educational software namely, Generic tools for learning, Content-based resources and Interactive instructional courseware. Starting from productivity tools to simulation & modeling, there are various generic tools that help learners to access, extend, transform and share information. Content-based resources help learners to access a vast source of educational resources that effectively can be integrated with the curriculum objectives. Interactive instructional coursewares are basically self-paced learning materials. These programs are helpful to learners to control their learning at their own place and convenience.

The integration of ICT with teaching and learning has produced some of the significant positive gains in learners' knowledge, skills and attitudes by providing the following key advantages:

(A) Explore and represent information dynamically and in many forms
(B) Become socially aware and more confident
(C) Increase motivation
(D) Communicate effectively about complex processes
(E) Develop better understanding and broader view of processes and systems
(F) Greater problem solving and critical thinking skills.

A Few Emerging Topics In ICT Integration

1. Multimedia: The pedagogical strength of instructional multimedia is that it uses the natural information processing abilities that we already posses as humans. Our ear and eyes, in conjunction with our brain, form a formidable system for transforming meaningless sense data into information. The old saying that" a picture is worth a thousand words" often understates the case especially with regard to moving images, as our eyes are highly adapted by evolution to detecting and interpreting movement. The major challenge in designing instruction through multimedia is, therefore, the choice of media and their application for optimising human learning with respect to the learning objectives. Multimedia courseware development process [4] is the systematic approach to the analysis, design, development, implementation and evaluation of learning materials. Instructional design aims for a learner-centered rather than the traditional teacher-centered approach to instruction, so that effective learning can take place. There appears to be an increasing realization by teaching faculty that in particular situation, multimedia courseware can offer a pedagogical improvement on traditional teaching methods by providing the learners with following advantages: • Exercise more effectively & efficient control over their own learning • Secure real time assessment & feedback • Secure more information on their own learning • Obtain situational appropriate learning assistance • Obtain more individualized learning assistance

2. E-learning: The link between distance learning and telecommunications is becoming even stronger, yielding new solutions to old problems, innovative educational resources and new teaching/learning practices. One of the most innovative and promising outcomes of this relationship is e-learning and online education, notably a process whereby teachers and students are linked up in an electronic media/computer network . The concept of e learning and how it relates to effective use of ICT is critically important for teacher education, because it places the focus firmly where it should be - jointly on pedagogy and the new ICT. The term e-learning, or learning via electronic media, nicely combines this twin concept: first, the changing focus of pedagogy to learning and, second, the new technologies stretching beyond the walls of the traditional classroom. In other words, elearning for teacher development is learning about, with, and through all electronic media (i.e., ICT) across the curriculum to support student learning. ICT is the means, and e-learning and the effective integration of pedagogy and ICT constitute the goal. There are a number of benefits to e-learning. These include any time learning, anywhere learning, asynchronous interaction and group collaboration.

3. Blogs: Blogs or classroom web logs are becoming increasingly popular with teachers and teacher education. Many experts predict that blogs will eventually become more successful teaching tools than web sites. A blog is a web page made up of usually short, frequently updated

posts that are arranged chronologically-like a "what's new" page of a journal. The contents and the purposes of blogs vary greatly from links and commentary about other web sites to news about a company/person/idea, photos, poetry, mini-essays, project updates, even fictions. A crucial blog mission is to link to other web sites, or, sometimes even other blogs. Many blogs are personal. Others are collaborative efforts based on a specific topic or an area of mutual interest. The use of blogs in instructional settings is limited only by one's imagination. There are many ways teachers can use blogs, some of them include content-related blog, networking and personal knowledge sharing, instructional tips for learners, course announcements and readings, annotated links etc., most importantly for the purpose of knowledge management. Learners can also take part in blogs by reflective writing, assignment submission, collaborative work, e-portfolios and sharing courserelated resources. For teachers, blogs are attractive because it needs little efforts to maintain, unlike more elaborate classroom web sites. Teachers can build a blog or start a new topic in an existing blog by simply typing text into a box and clicking a button. Such ease of use is the primary reason to predict that blogs are more successful teaching tools than web sites.

Stages of Web Development

Continuum in Teaching & Learning System A framework [11] of use of the Web has been suggested as continuum approaches. These levels represent continuum from basic occasional use to advanced continual use. They are: (1) informational, (2) supplementary, (3) complimentary (4) hybrid and (5) total.

Level 1: Information Web Use The informational level of Web use is the most common and easiest to manage. Informational Web use consists solely of providing relatively stable information to the student. Typically, this information is administrative in nature and may not convey course content directly. Students may access this information from time to time during the course for reference purposes, but they would not be expected to review it on a frequent basis.

Level 2: Supplementary Web Use The supplemental level of Web use is becoming more common, is more useful than the informational level and is only slightly more difficult to manage than the information level. The key difference between Level Two and Level One is that the supplemental level actually provides course content information for the learner. As the name suggests, however, this information is not critical to the course; it is intended as an addendum to the core content. Level Two consists of the instructor placing course notes and other handouts on the Web.

Level 3: Complimentary Web Use Essential refers to the fact that the student cannot be a productive member of the class without regular Web access. The essential level of Web use is still fairly uncommon today. At this level, the student obtains most, if not all, of the course content information from the Web. At this level, one might think, for lack of a better example, of the Web replacing textbook in the course

Level 4: Hybrid Web Use The communal level of Web-based instruction is only just beginning to receive widespread use. At this level, classes meet face-to-face and online. Course content may be provided in an online environment or in a traditional classroom. Ideally, students generate much of the course contents themselves. This level goes beyond basic HTML and requires the use of other online tools, such as Internet chat, bulletin boards and perhaps one- and two-way desktop video.

Level 5: Total Web Use At this level all of the course content and course interactions occur

online., this level should be seen as a sophisticated, constructivist virtual learning community. While it may include some degree of traditional content presentation, student practice, feedback and assessment practices found in traditional distance instruction, it is often comprised of learner-centered, constructivist pedagogues. At this level, both instructor and students must have a high level of technical expertise and sophisticated learning strategies.

CONCLUSION

As we become increasingly supported by ICT, teaching and learning will not be the same as before. We will have to make use of the rich and exciting opportunities offered by the new technologies in education to reach our training goal and mission. One of the objectives of the present paper is to provide better understanding and appreciation of the role of ICT in teaching and learning system. Several view points of integrating ICT in teaching and learning system has been discussed. Learning is not a transfer of knowledge, rather an active construction. This paradigm shifts give the learners a completely new role that was not earlier described in the transmission model of teaching. Technology and teacher professional development in its use are best introduced in the context of broader educational reform which embraces a shift away from teacher-centred, lecture oriented towards learner centred, interactive and constructive learning environment. Multimedia and ICT can play the role of catalyst for such educational reforms. Multimedia courseware can promote effective instruction that is more engaging; learner centred, interdisciplinary and more closely related to real life events and processes and adaptive to individual learning styles and needs. It also encourages higher order thinking skills and help to construct knowledge socially. Thus teacher professional development in the use of interactive technology should embody and model the forms of pedagogy that teacher can use themselves in their classroom.

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ROLE OF ICT IN JUDICIARY

*Bhanu Rana**

INTRODUCTION

E- Judiciary is a step towards modernization of Indian legal system. Indian legal system has a long history under different rulers. The legal system underwent many changes but the basic structure of judiciary did not alter significantly. After independence also the old system continued under the frame work of Constitution of India and Indian judiciary became a unified pyramid structure. Although the modern India has retained the said structure but the information and communication technology has paved a new line of thinking in modernizing Indian judicial system.

NEED E-SOLUTIONS IN COURT

The accumulation and slow disposal rate of pending cases has increased burden on our judicial system. So far very little has been done inside the courtrooms to streamline overall functioning and to provide assistance to the Judges. Physical Record Management is extremely bulky, inefficient and cumbersome. Judges have to depend on case files, physical evidence & records. Cases, Judges and Courts keep on changing during the course of judgment. Witnesses and accused may change their statements and turn hostile. Courts have to maintain sizable records in paper form, which is prone to physical tempering & environmental degradation.

HOW IS ICT IMPLEMENTED IN JUDICIARY?

Current IT Infrastructure to modern day technologies are brought up which includes, Data CentreHardware Sourcing and Web Server and hosting setup.Integrated e-Filing, e-Courts and Case Information Management System (CIMS) are implemented. Court Website integrated online with e-Filing are developed.ICT training should be given to the Judges, Registrars, Clerks, IT Admin and Support Team. Training should also be given to support & maintain the Software Application.

JUDICIARY IN INDIA TODAY & TOMORROW WITH HELP OF ICT

There is no need to carry heavy files to the court rooms as they are available at click of a mouse. Files can be tampered and there can be environmental degradation. Visual playback of the case Video records will help to Playback. Different courts are able to share the information online. Earlier the Required Case documents and evidences are submitted manually in Court. Through e-

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filing in e-Court concerned stake holders have the facility to depose/upload the documents to the case file from their own premises. Earlier the Cases could not proceed due to the non- availability of accuse/witness on the scheduled date. Nowadays through video conference facility they may be allowed to participate in proceedings from remote locations. Before Physical Transfer of case to other courts caused long delays but with ICT No such effect. Files can be transferred across Courts in seconds.

MAIN COMPONENTS OF E-JUDICIARY

1. Case Information System -It is a unique software for all the Courts in India introduced to maintain uniformity between the working of Courts in India.
2. Digitization-Digitization of Paper Records, Digitization of decided cases; Indexation of digitized records , Digitization of current files and simultaneous introduction of e-filing.
3. E-Courts –E-courts Would, it would solve the problem of shortage of storage spaceSince all the documents would be in digital form. From the presentation of a plaint or petition till its disposal and archival, no paper is used will be used. Since it would be a automated court and paperless, it will reduce the burden on human resources.

Various E Services-There is facility of On-line payment of court fees, process fees etc. there is e-case file facility using a portfolio format. Integration of document management system (DMS) with case management system (CMS) is available).

BENEFITS OF E-COURTS

1. **E-hearing**-Computer for judge with LCD touch-screen display monitor is provided to the judges. One computer each for the typist and reader is also provided. There are Computer connection points for the lawyers also. Facility for video-conferencing and audio video-recording of evidence and large LCD display panels is also there in the court rooms.
2. **E-Court-** Hearing Connection to high speed LANis also present for accessing case files and case management details located in servers. The judges can on the click of a button, access to e- case file. The reader/court masteris relieved of the burden of lifting heavy files and worrying about papers of different case files being interchanged. The advocates bring their laptops and open up the relevant case files while arguing.
3. **E-Court Orders/ Judgments-**Soft copies of Orders and judgments are typed by the Stenos on their computers which are accessed by the Judge over the LAN and corrected without requiring any draft being printed on paper. The finalized orders/judgment are signed by the judge using his digital signature and added to the relevant e-case files via the DMS and CMS. Digitally signed copies of orders and judgments are uploaded instantly on the court website for easy access over the internet. e-copies of entire e-case files are made available on-line to the parties or authorized agents on nominal payment. Certified copies either in paper form or digital form would be provided by the court registry.

E-Services-Service of summonses, notices, warrants are sent through e- mail via the internet. E-mails are send to the nearest post-office/ courier office and served on the recipient locally. The digitally authenticated service report transmitted to the court registry via e-mail. The courtprovides dynamic cause lists over the internet and mobile phones. The e-cause lists is also be e-mailed to advocates. Parties may be alerted of next dates via e-mails or SMS. GPS enabled Camera Phones to the Process Servers for effective service of Notice/Summons Online status of Certified Copies.

CONCLUSION

E-Courts/E-Judiciary is a reality in India. We have to prepare ourselves to face this challenge. Our mind-set has to change. Information Technology creates both opportunities and challenges. These opportunities and challenges need to be fully grasped, and mastered, if the institutions that you lead are to take full benefit of what Information Technology-Courts is need of the hour. It will be a giant step towards clearing of backlog of cases.

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ROLE OF ICT IN ENHANCING STUDENT LEARNING AND MOTIVATION

*Amandeep Kaur**

Technology has become an extremely good asset in every area of our lives and has become an integral part of society. But above all it has given a large contribution in education sector by introducing various tools and methods .This paper throws a light on various aspects that how, the ICT has made an impact on learning process and put a contribution in enhancement of motivational process of students. ICT has bought tremendous changes in teaching methodologies. The conventional ways of teaching mostly has been depreciated by latest tools of ICT. The teacher centered learning now has become student centered.

Keywords: *ICT, Lateral thinking , Collaborative learning , Blogs*

INTRODUCTION

Education is a socially oriented activity and it is playing a vital role in establishing the foundation of society .Education cannot be delivered properly unless we have proper means of transformation of information ICT is an arrangement of special gadgets which are made up of hardware and software , and are used to share information between general populations . It can be used to collect, process, store and present data. ICT has encouraged lateral thinking in students. When ICT is integrated with learning , it enhances the student motivation and students become more interested in learning new things .ICT enhances the quality of education by using several ways and facilitate the students to acquire basic skills .It is important source of innovation and improvement for learners across the globe . Students can now learn the new things outside the classroom .ICT and learner motivation can be defined as :-

" ICT stands for information and communication technologies and is defined , as a diverse set of technological tools and resources used to communicate , to create , disseminate , store and manage information ".

"Learner motivation is often defined as being intrinsic , where learner are interested in the course content , or extrinsic , where learners are interested in earning a course grade or credit" .

IMPACT OF ICT ON TEACHING, LEARNING AND LEARNER'S MOTIVATION

Worldwide research and a report made by National Institute of multimedia Education in Japan

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proved that increase in the use of ICT in education integrated technology has a positive impact on students achievements . The results also presented that students exposed to technology through education has better knowledge, presentation skills and an innovative capability. More than 60% students are using ICT for their studies.

ICT is generally familiarizing the students and teachers with the use of computers. Access to informational resources increases the learning gains for students as well as teachers. ICT is saving the time of learners and providing the information as such needed by them within the classroom as well as outside the classroom.

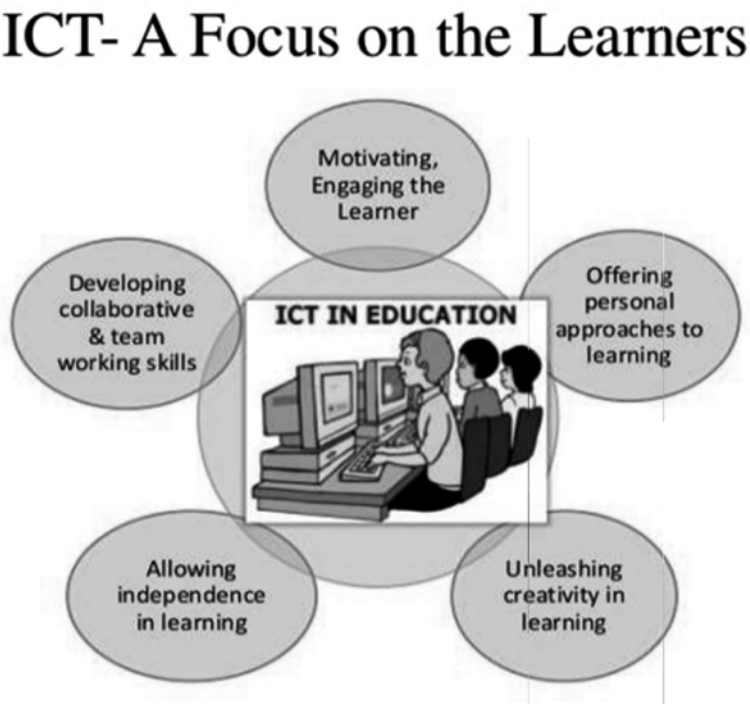

Figure: - role of ICT in education

In older days, The learner had to go to library for gathering information and they mainly remained dependent on teachers .learning process was typically bound in classroom. But now with the use of ICT tools learner can access online information from various websites and blogs , can watch online video lectures and can evaluate their performances by giving online quizzes and tests . Students can prepare online assignments and also can submit them which results in decreasing the paper work. Collaborative learning is also possible and students are not only restricted to classroom. . Teachers can prepare lecture plans, can check online assignments, can evaluate assignments simultaneously. Learners get motivated to enhance their knowledge hence, it motivates the learner to gain more knowledge.

ICT TOOLS

- Representational tools (MS Office package)
- Presentational tools (Power point, blogs)
- Searching tools (search engines, web pages)

- Educational sources (Digital Library, E-books , E-publications)
- Hardware tools(Desktop and laptops, Projector, Digital cameras ,tablets , Ipods Web boards ,interactive white board)

BENEFITS OF ICT IN EDUCATION

- Promotes Learning by doing approach i.e. students perform physical activities rather than only watching video lectures and demonstrations.
- Enables self-paced learning i.e. learner can set up its own schedule instead of following a restricted study structure.
- Provides access to wide range of up-to-date learning materials and by using them learner can get different views on the same topic
- Enriches learning through a combination of audio, video, images, text and animation. It enhances learners engagement .
- Enhances learning through interaction and collaboration which results in exchange of ideas and creativity .

FUTURE OF ICT IN INDIAN EDUCATION SYSTEM

ICT has become an integral part of nearly all sectors and segments especially linked to the education landscape. The present-day needs of developing countries require it to adopt several scientific and technological innovations. As a result, education sector is facing a lot of challenges in meeting the skill demands. Indian Government it taking more initiatives of promote ICT for education . With the help of ICT , distance education has gain popularity . Now, any one can enroll in courses and get e-content. MHRD is also taking various initiatives to enhance quality education by providing platforms like SWAYAM for teacher .

CONCLUSION

The use of technology in education sector has brought changes and enhanced the quality of teaching and learning.ICT has given a major contribution in encouraging learner engagement and motivation. ICT play a vital role as a strong agent for change among many educational practices like conducting online exams. Traditional forms of teaching and learning are increasingly being converted to online and virtual environment .It has facilitated the teachers as well students by providing them required information. The use of ICT in learning not only results in the cognitive, social and emotional development of a child, but also has a major motivational influence on his/her learning capabilities. It is proven that students harness positive feelings towards education and learning when they use computers to complete tasks,ICT is playing a major role in building the society.

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INTEGRATION OF ICT IN COMMERCE EDUCATION

*Chetna Gupta**

Information and communication technology (ICT) is one of the intriguing as well as promisingarea of improving quality education in order to meet the needs of the world. It has meaningfully brought positive revolutionized teaching process by modifying many instruction strategies .It plays as avitalcatalyst in each and every endeavor of education, teaching, learning, research and publishing. It has made teaching moreeffective, interesting, creative, evaluative, collaborative, useful and ultimately more successful in every field including commerce and management. It helps to develop a knowledge-based student community and improve the educational outcomes. Active and collaborative teaching and learning conditions facilitated by ICT provides the complementary supports as well as significant interaction between learners and educators. Unfortunately, some of the commerce teachers hardly utilize ICT during teaching and generally used lecture method to teach commerce, that is, a practical subject, in a theoretical manner. Twenty-first century teaching learning skillsemphasize the need to transform the idea of imparting education with in the four walls into making virtual classroom a reality. The shift from traditional teaching methods with a technology- based teaching and learning methods will bring innovations not only in teaching, but also in knowledge. So, this paper is a humble attempt to understand the effective use of ICT in the teaching-learning process, effective elements of ICT for teaching and learning prospective, highlighting on the importance of ICT, recent challenges, opportunities in commerce and offers some suggestions to integrate technology in teaching-learning process of commerce for the betterment of students as well as teachers.

KEYWORDS: *Information and communication technology (ICT); Teaching and learning; Education; Commerce.*

INTRODUCTION

Change is the law of nature and as the world is approaching 21st century we cannot stop this avalanche of change. 21st century is the age of information and technology which is one of the basic building blocks of modern society. The way technology has become the knowledge transfer highway is totally unbelievable. The imperceptible momentum gathered by the ICT has become the talk of the day. It has embraced every aspects of human endeavor, spanning across education, business, market, agriculture, shares, trade, commerce and many more. Most of the arenas especially education has been greatly influenced by this digital phenomenon. Within a very short time, ICT has made tremendous changes in the present-day world. ICT is one of the intriguing as well as promising area of improving quality education in order to meet the needs of the world. It provides a great flexibility

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in spreading quality education. It has meaningfully brought positive revolutionized teaching process of many subjects by modifying many instruction strategies. Increasingly, ICT is being applied successfully in each and every endeavor of education, teaching, learning, research and publishing. Teacher, student and every people related to education has embraced ICT with open hands and heart as it connects learning to real life situations. It is a pivotal tool for teachers for making teaching-learning process more easy, effective, interesting, creative, evaluative, collaborative, useful and ultimately more successful in every field. Through digital phenomenon, every range of subjects including science, mathematics, commerce, arts and other major fields can be learned more effectively. ICT provides great flexibility in education so that learning can take place at anytime and anywhere. It is essential for a meaningful interaction for both learners and educators to interact simultaneously with ease and convenience. They are not bounded to the limited curriculum and the resources as there are many online course materials available to ensure that learners are able to access any knowledge any time. One can access any digitalized form of services through multiple resources which are abundantly available on various websites and knowledge can be acquired through video clips, satellites classes, audio sounds, visual presentation and so on. With the help of ICT, teaching and learning is not only based in the classrooms, but also can happen if both learner and educator are physically in distance. ICT therefore plays a crucial role in education as it provides a gamut of educational services to both learners and teachers. The whole scenario of the educational institutes is changing, that is, from one way to two-way communication. There is a shift from traditional teaching with technology-based teaching and learning facilities and tools. In the traditional curriculum, the method used for teaching consisted of nothing more than chalk and talk which is most of the time boring and not to gain interest to the student. But the present 21st century's education is student centric education which set aside the monotonous traditional teachers-speaking and students listening approach. It is capable to provide a proactive, easy access, comprehensive teaching and learning environment. The technology-based teaching and learning methods not only brought innovation in teaching but more importantly in knowledge. Active and collaborative teaching and learning conditions facilitated by ICT provides the complementary supports as well as significant interaction between learners and educators. But unfortunately, commerce educators hardly utilize the technological principles to achieve the desired educational goals. They do not use ICT in teaching commerce. They taught the content through lecture method only, that is, they teach a practical subject in a theoretical manner. It leads to lack of generic skills such as analytical and problem-solving skills, personal and interpersonal communication skills, management, negotiation and organizational skills, together with the ability to apply these skills in a range of unique situations which results in low employability due to inadequate learning skills in students. They face a lot of difficulties in dealing with banks, insurance companies, firms etc. they find it difficult to start any business and even to get any job. This type of ignorance about practical knowledge needs to be stopped. ICT can bring improvement in the teaching of commerce.

REVIEW OF LITERATURE

Wanjala, Elizabeth. K and Mukwa (2011) found that few teachers are using ICTs to manage the classroom and to integrate technology into several of the content areas. Professional development options were varied. They pointed out the most teachers use trial and error, learn through course work taken at colleges or universities, and support others or receive personal or expert support as

significant methods of learning how to use Information Communication Technologies.

Rachmawati and Johancynthia (2010) conducted on ICT based learning schools to assess the challenges on implementation. Results indicated that ICT based learning the role of teachers were significantly changed from transferring of knowledge into facilitating of learning, from a main source person to be a manager of learning. Other challenge is also addressed to head teachers in encouraging teachers to implement ICT based learning in order to improve student's capability and skills.

Visvanathan (2010) conducted a predictive study on secondary schools to examine the educator's pedagogy influencing the effective use of computers for teaching purposes in classrooms in South Africa. Results revealed that educator pedagogies were the highest predictors on the use of computers in the classroom. Although the quantitative analyses for educator support, training and attitude were the lowest predictors on the use of computers, the qualitative analysis, 50 nevertheless, found sufficient support for it. Educationists and policy-makers must include all principals and educators when technological innovations are introduced into schools. All these role-players need to be cognizant of the implications if innovations are not appropriately implemented. Including the use of computers in educator training programs is important so that pre-service educators can see the benefits of using the computer in their own teaching.

Rosnaini and Ismail (2010) examined the "Impact of training and experience in using ICT on in-service teachers basic ICT literacy". The study found that majority of the teachers had moderate basic ICT knowledge and skills, and perceived ICT positively. Formal ICT training and ICT experience influence the teachers knowledge, skills and attitude. Therefore, teachers especially the older ones and normally with more teaching experience need to be identified, and provided with specially designed training programs, in various forms of ICT courses and workshops.

OBJECTIVES OF THE STUDY

The objective of present study is:

1. To highlight the effective use of ICT in teaching and learning process.
2. To identify the benefits of ICT in commerce education.
3. To identify the recent challenges faced by educational institutions in adopting ICT.
4. To suggest some of the measures to integrate ICT in commerce education in India.

RESEARCH METHODOLOGY

This study is mainly based on secondary sources. Information is obtained from articles, journals, books, websites, expert opinions, etc.

EFFECTIVE USE OF ICT IN TEACHING AND LEARNING PROCESS

The field of education has been greatly influenced by ICT, which undoubtedly embrace the teaching-learning process. In order to improve student's learning, educators became more focus on the use of technology. Present day, teachers should prepare to cope up with different technology to promote student learning. Three main stages for ICT to be highly valued and regarded by the teachers have identified by Hermans, Tondeur, Van-Braak, and Valcke (2008) are: integration, enhancement and complementary. Integration approach is used to improve student's achievement and attainment by implementing right use of ICT in particularsubject area in which complex concepts

and skills are involved. In Enhancement approach, ICT is used to give great importance on the topic introduced. For example, to present the topic in a very innovative and creative way Microsoft PowerPoint can be used in which both teacher and student participate in classroom discussion, can exchange ideas and thoughts. Lastly, complementary approach is when the ICT is used to aid and support the student's learning. This approach allows students to be more organized in which they can access the important notes from computer, submit their works by email and fulfil the task given to them by accessing any information from various online sources. Applying educational technology as a constructivist device in classroom allow the students more freedom in taking initiatives, to learn on their own, to be more creative.

BENEFITS OF ICT IN COMMERCE EDUCATION

Up to date knowledge: ICT is like a blessing for every commerce students and teachers as one can able to access any kind of recent knowledge like may get a knowledge of economic policies, budget, etc. ICT helps them by providing latest knowledge and skills required in today's era.

Distance learning: With the development of ICT, distance education programs gained a momentum in commerce education i.e. satellite classes. These classes are very popular among professional courses like CA, CS, etc. distance classes provide education anywhere and anytime. With these classes each student receives high quality content.

Builds confidence: With the use of ICT, students can access knowledge anytime and anywhere. Students take part in video lectures which leads to increase in confidence as they share same lectures with many other students across the country.

Faster learning: With the integration of ICT in education students learn upto twice as much as in the classroom. One can have video lectures, power point presentations, e-books, etc. which helps the students to enhance their skills and to learn fastly. Thus it act as a learning tool for them.

Develops curiosity and creativity: ICT proves very beneficial for the students and teachers as it develops curiosity and creativity by familiarizing them with new situations and serves as a learning facilitator for the issue of education.

Assisting tool: Now a days, ICT acts as an "assisting tool". IT assists teachers and students in preparing lectures and for conducting research, making assignments, communicating and collecting data as it helps in creating real-life products rather than the regurgitation of received information. Different tools are used such as word processing, Database, Spreadsheet etc.

Enhancing academic performance: Computer with internet can enhance the understanding of students towards the latest development of commerce by availing the mediums of social networking sites. It allows the students to be more organized and more efficient by fulfilling the task given to them by using various online websites.

Imparting practical knowledge: It helps teachers to provide practical knowledge to students of various aspects such as provide knowledge about how to file income tax online, how to raise funds online, how to do net banking and the list goes on and is ever evolving…

RECENT CHALLENGES IN INTEGRATING ICT

The advantages of ICT are hindered by the presence of many challenges which are as follows:

- It fails to meet the basic infrastructure facilities like inadequate computer & network facility, lack of well resource library facility and many more.

- Some of the faculty members have lack of specific knowledge about technology. Teachers are fails to integrate ICT in their pedagogy.
- A lack of in-service training is the stumbling block in teaching commerce with ICT.
- Need for expensive infrastructure and large setup costs.
- Lack of ideas about how integrating technology will improve quality of commerce education.
- Lack of technical and financial support.
- Pressure to score highest marks in examinations.
- Lack of internet access in many educational institutes.
- Lack of motivation and support.
- Lack of security and maintenance.

SUGGESTIONS FOR INTEGRATING ICT

A teacher can never truly teach unless he is still learning himself. A lamp can never light another lamp unless it continues to burn its own flame."

- *Rabindra Nath Tagore:* Teachers play a crucial role in integrating ICT as teachers are the core of living society. So, to inspire the students to embrace ICT with open heart, educators will have to know first the pedagogy to impart knowledge by integrating ICT. The following suggestions may be adopted for the promotion of ICT in teaching of commerce:
- Presence of highly motivated teachers towards a successful development of ICT in education.
- As mentioned above that some of the teachers have lack of knowledge to integrate technological policies so the development of technological pedagogical content knowledge (TPACK) will help the teachers to understand how ICT can be used in education to make it easy and effective.
- Educational institutes may be provided 24*7 free Wi-Fi internet facilities so that they can access it without any inconvenience.
- Educational institutes should provide digital infrastructure.
- To inspire students to adopt new trends of ICT in commerce be it Online-shopping, net banking, filing returns, online-payment of bills and so on, teachers will have to adopt it first.
- Institutes need to provide accounting softwares like Tally and research software to educators so that they have hands on experience of using them in their daily life and thus they may teach the same to the students.
- Teachers need to visit frequently some important sites such as RBI, HRD ministry, ICAI, UGC etc. so that they can update latest information and developments to the listeners.
- Teachers need to encourage students to use e-library so that they become e-readers.

CONCLUSION

ICT within a very short time have become commonplace entities in many fields. It has improved and increases the quality and accessibility of education to students. It has changed the whole scenario of the teaching learning process. It helps parents, teachers and students to come together. Now, education has much broader objectives and goals it is not merely teaching students within the four

walls of the classroom. It helps to deliver information anywhere and anytime. Realizing the benefits of ICT in every aspects of life, many educational institutes have provided digital infrastructure in classrooms, libraries,computer labs etc. with the use of ICT students can now browse through e-books, sample examination papers, previous year papers etc. and can also have an easy access to resource persons, can easily register courses by paying fees online, can check their result after every examination and more fundamentally share their ideas easily. Thus, ICT Mantra will make the journey of integrating IT with education delightful for the betterment of digital society and economy.

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APPROACHES TO E, M AND U LEARNING AND THEIR RELEVANCE

*Ms. Mandeep Kaur**

Due to globalisation, in these days, the concept of E Learning, M learning and U Learning has become vital aspect in Indian Education System. These concepts have certain implications in the Indian Education System scenario. Over the last few years, computers and new technologies have been introduced to our education system. Due to the these, educators are making more efforts. The technology of E,Mand U learning has introduced the new ways to students to use all the resources available. This paper reveals the new education technology to improve the education standards. It can also be helpful in distance education system. The objective of this paper is to find out the particular information related to these aspects. Some of the major learning technologies has also been explained, which are being used by the teachers, students after the arrival of computers, internet and mobiles. The objectives of E,M and U learning reveals the raising level of education development in India.

Keywords *:Learning, education system, technology.*

INTRODUCTION

The invention of computers, internet in the education sector has brought a dramatic change in the Indian education sector. It has simplified the process, procedures and pattern of education and learning processes. With the help of these technologies, a person can learn at anywhere and at any time without having books and bags in their hands. Latest and updated information and technology can be used at any time with low or no cost. New technologies have been replaced the old ones. E learning, M learning and U learning are the emerging trends in our education sector. E refers to electronic or web-based learning, M learning refers to mobile learning and U learning refers to Ubiquitous learning. These technologies have changed the education scenario in our country. It has brought the flexibility in education system in these days. These technologies also offer opportunities for everyone to learn. This can also bring an essential change in offering and creating the new generation students and teachers. These also help to maintain the global standards and to compete with the world globally.

E learning: Includes computers and laptops whereas M learning includes mobiles and smart phones. M learning is truly short and dynamic process. These learning systems are based on the formal teaching method with the help of updated technology. The concept of E learning includes the

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use of electronic resources such as computers and internet. It can also refer to skills and knowledge of network enabled transfer and delivery of information through these medias. At the time of its origin in India, the learners of India were not prepared to adopt these technologies as these technologies need training, knowledge, and skills to operate it. Indian system was lacking this at that time. However, with the increase in the technology, the learning system has also become advanced. Introduction to computers, smart phones, tablets brought a change in the education system. Books are replaced by internet which is accessible at any time. It has provided best facilities to the corporate, agriculture medicine, service, business, and education sector learning mainly classified into two main types. These are:

E journey: It is basically related to internet. It is sort of training program, in which we search for websites and explore the web. It includes the various sites which provides data and help the learners to use the data which is suitable for them.

Blended learning: It is the modern approach to e learning. It includes the models of e learning like CD ROM etc.

E learning includes the large masses, flexible learning structures, reduces the problems of unrest and indiscipline. This technology is eco friendly as no paper is used while working with e learning. It is the source of effective and efficient learning. This method is totally transparent and authentic method of learning. It is self-directed. It includes the multiple methods of learning through the internet. It is the solution to the todays ineffective training problems and challenges. It also leads to the collaboration and interaction among the students, teachers, and the learners. It enhances the growth and technical skills of the students. It is the education that incorporates the online learning. It can also take some forms of courses, training modules, coaching etc.

M learning refers to mobile learning. It has brought a strong portability by which we learn through a mobile device. It can be defined as the mobile learning processes which transfers the innovation into learning contents. It can also be a subset of e learning. The process of studying, communicating the study materials through our mobiles is known as mobile learning. It is accessible by everyone as no special skills or training is required to operate it. It is also a flexible learning system just like e learning system. These learning systems have reduced the barriers of time, place, and distance. Mobile learning technology is the cheapest source of information as compare to other technologies. It has the context awareness properties. The information gather from this resource is always permanent in nature as we can use it at any time and at any place. Mobile devices use for mobile learning are light in weight and not costly as compare to e learning. It has increased the mobility among the learners. It is a new stage in learning process as it does not have any boundaries. It includes the mobiles, portable computers and tablets, PDA etc. mobile learning is very accessible in nature, it is always available as the learners use it when they want to use it. It can be retrievedby the students and teachers immediately. A flexible environment is provided to the students, teachers, experts, and other learners that provide adequate learning material. M learning has following types:

Notebookcomputers: It is costly as compare to other sources generally small in size and it supports the wireless communication.

Tablet PC: This is also an expensive source of mobile learning with all the facilities a computer has.

PDA: It refers to Personal Digital Assistance. It is also small in size having good processor power.

Smart phones: These are the devices used for voice as well as video communication across the world. These have different internet browsers which helps the user to access the information at anywhere and at any time.

WAP: It refers to Wireless Application Protocol. This is unlicensed wireless communication device.

Bluetooth: It is also a wireless technology used for communication and data sharing purposes linked with mobiles, pc, laptops and other digital gadgets.

GPRS: This is General Packet Radio Service. It has very good speed as compare to traditional GSM system.

U learning: It refers toUbiquitous learning. It is 24*7 learning process. It is the combination of e learning and m learning process. It is first introduced by Mark Weiser in the late 1980. It includes the integration of computers into the physical world. It refers to the new build up of information in the communication processes and the global world. In it, many small electronic devices such as small computers which have the communication and computation facilities like other technologies are used. These small computers have the properties like network sensor which helps us to interact with the living world. Exchange of data with the help of these devices can also be done. It u learning, the students acquires any wireless device which is connected to any type of headphones and sensor which helps to identify the location and to track any student within the u space. If student approaches to any object, the date related to the object will automatically be transferred to the device which they hold.It has very vast technological aspects. This technology is also omnipresent in nature that it can also be present at anytime and anyplace. This technology has also the feature of permanency, accessibility, and interactivity.This learning process can be used in our daily life also. We can interact or communicate with the experts, teachers, and learners with the help of u learning. We can access our data, documents at any time and at any place with this technology. Immediacy is another characteristic of u learning that we can solve our problems quickly. Learner can get their data and information is the sorted way. ICT has made essential changes in our education processes. Therefore, u learning is a concept, which helps to research for possible topics, exploring more reflection in education process. U learning processes are used in educational institutes for faculty, classroom learning and to maintain the standards of education. U learning is also used to enhance the digital technology in every sector. It is a new learning process which is the expansion of our traditional and conventional processes of learning.

Implications: These learning approaches are very eco friendly as no use of paper is made in above technologies. It also provides environment friendly solutions. We can share our knowledge an get help from the experts sitting across the borders. It also helps to make the information global at very minimum cost. These are self-paced learning concepts. These processes are easy to accommodate as no or less space is required to use it, so everyone in the class including teachers and students can use it freely. The youth, who is getting lost in other activities, can engaged in study activities interestingly with these technologies. Assignments should also be done in a collaborative way with the help of everyone. These technologies can be act as hope in future Indian education system as well as the development and growth of India education system.

OBJECTIVES OF THE STUDY

- To focus on the study of E, M and U learning.

- To study the approaches of these emerging concepts
- To analyse the relevance of E, M and U learning in Indian Education System

RESEARCH METHODOLOGY AND DATA COLLECTION

This research is mainly based on the descriptive study. The data collected is mainly from secondary sources. It includes different websites, journals, research papers. The literature provided by different authors is also reviewed.

LITERATURE REVIEW

- **AK HULME, M SHARPLES** in their research study "Innovation in mobile learning" analyse that researchers and teachers have done significant projects in R&D with the help of mobile learning. Their research reveals how projects have been done with this technology. They also study the impacts of mobile learning on educational practices.
- **E. BARAN** in his study **"A review of research in mobile learning in Teacher Education"** says that mobile has become an essential learning device for learning and for education purposes. He concentrates on the value of mobile education for the learners. He concludes main findings that engaging with mobile learning practices become beneficial. He also finds out the main challenges which are being faced in mobile learning.
- **Lawrie Phipps & Brian Kelly** in their study "**Holistic approaches to e-learning accessibility"** say that the importance of e learning is emerging thing. They analyse that e learning can also be source of challenges. Proper framework is needed to implement e learning processes. This also leads to the quality assurance. Practical concepts and implementation of e learning is also discussed by them.
- **Robert A. Ellis , Paul Ginns & Leanne Piggott** in their study "**E learning in higher education: some key aspects and their relationship to approaches to study"** reveals that aspects related to e learning for the university students. It will lead to the better understanding of different concepts. Students response is also reviewed in this paper.

CONCLUSION

Learning the new techniques can be unique. These concepts have played essential role in modern education system. It encourages teachers as well as students to learn by their own selves. It will also bring an important change in our society. It is an efficient process of learning which is beneficial to all the sectors of economy to maintain the quality and global standards of education. Teachers, students, and learners will also have the advantages of the concepts of E, M and U learning. These concepts also enrich the knowledge of the learner. So, it can be concluded that people of India must use these types of technologies to compete with the global world.

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ICT : REVOLUTIONIZING EDUCATION, REVOLUTIONIZING LIVES

*Megha Dua**

In the last few years there has been a debate among the computer scientists and educators regarding the ability of the programming techniques to enhance the levels of education. A question often emerges on the use of technology in the field of education as the improved technology has managed to revolutionize many areas of our life so education cannot be untouched. The increased inventions, hopes and predictions have necessitated to bring about a change in the pattern of education. The present paper seeks to analyze the role of Information and Communication Technology in revolutionizing the present system of education.

Key words: *ICT, Education, Revolution, Teaching-learning.*

INTRODUCTION

Maintainence of information is linked with the amount of effort which is invested by us in learning. Having no or little effort is going to have a result of less or no amount of outcome. The role of a teacher is no doubt concerned with the transfer of information to students .Internet nowadays plays a very strong role in motivating the students to have information for instance You Tube offers millions of videos which are uploaded by experts in different fields. However, the role of a teacher as being an inspirer, a learner, a facilitator cannot be ignored. The fascination of technology seems unmatchable. Though this technology cannot surpass the human teacher yet it is also not ignorable that ICT has managed to cause a revolution in the field of education. The use of ICT in teaching learning process is a relatively new phenomenon and has also been the focus of researchers. A large number of innovations being introduced by ICT include E-learning, e-communication, quick access to information, the online teaching learning process, online advertisement, student online registrations and many more which have no doubt led to the increase in the chance of excellent integration of ICT in the teaching learning process. The whole world is in every aspect of human activity involves in one way or the other the use of information technologies. The role of emerging technologies in the field of education and training has enhanced as well as challenged the conventional education system.

OBJECTIVES

To study the use of ICT in education.

To study the benefits of ICT in Education and its usage in India.

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RESEARCH METHODOLOGY

The paper makes use of secondary data for the collection of data in the form of books, journals, reports.

Information And Communication Technologies: The primary root to the development of a country is by way of knowledge. ICT plays a crucial role in shaping the life of a student as the modern ICT have completely transformed human lives. The use of computers is considered as an effective tool for the purpose of utilization in every field of studies at any time and at any place.

ICT in India: The use of ICT includes the use of communication devices like computers, hardware networks, software, video conferencing, pen drives, internet, www, Web 2.0 and social media etc.

Sattelite Communication: The launch of the satellite for communication called as INSAT and EDUSAT in the year 2004 for the purpose of education, INSAT -4CR in 2007 . A Web Portal named SAKSHAT which is a one stop Education Portal for the purpose of enhancing the high quality e-content in all disciplines and subjects.

Video Conferencing: A two way communication system also known as teleconferencing requires the use of television video and sound technology as well as the use of computers so as to enable the people in different locations to communicate with each other.

World Wide Web: Known as www, this is simply the web which helps to publish, organize and provide the access to information on the Internet.

RFID Technology: The Radio Frequency identification is the use of electro-magnetic fields in different ways for the purpose of identifying and tracking the tags which are attached to objects. Nowadays, RFID has been used in the library circulation operations which will be of immense help for the librarians to reduce the valuable time which is spent in scanning barcodes .

The National Mission on Education through Information and Communication Technology (ICT) has been started as a Centrally Sponsored Scheme to unleash the potential of ICT, in providing high quality personalized and interactive knowledge modules over the internet.

OPERATIONAL DEFINITIONS OF ICT

E-Learning: E-learning is a learning program which makes use of an information network such as the internet, an intranet or extranet whether fully or in part for interaction or facilitation.

Web-Based Learning: It is a subset of e learning and basically refers to the use of an internet browser, blackboard or internet explorer.

Blended Learning: It is learning models which combines the face to face classroom practice along with the face to face classroom practice with the e-learning solutions.

Constructivism: It is a paradigm of learning which also requires emerging pedagogy in contrast to the existing behaviourism in learning.

Learner-Centred Learning Environment: It is that kind of environment which pays attention to the knowledge, skills, attitudes and the beliefs of the learners where its impetus is derived form a paradigm of learning known as constructivism. Presently there are four areas of education which include Teaching, Learning, Curriculum and Educational Programme.

Benefits of ICT in Education: ICT offers a large number of benefits in education as

- Providing a medium for teaching and learning so as to provide a flexibility to the provision for course provision.
- ICT can help in making the education system very productive and interesting by giving

powerful instructions and also able to extend the educational opportunities to masses.As a result of ICT revolution in schools and colleges it has been possible for the students to make use of laptops computers.

- A computer enables to use high speed information exchanges to occur within the individuals around the world. The use of Information Technology helps to bring the institutions as well as the world close to each other.
- The Indian Information Technology and industry has a significant contribution to GDP while providing opportunities for employment directly or indirectly to a large number of people.
- The gains of the students in terms of academic insights is much more in case of the ICT usage rather than the conventional methods.
- Application of audio visuals in the field of education is quite useful as learning process keeps on taking place simultaneously by listening and observing the information received.
- The information and communication technology is quite beneficial for the students as it helps them to find out new job opportunities as well as doing long distance courses.
- The education system has completely got a new makeover by the impact of ICt as it has transformed the students into student centered learning.

Application of ICT in Education In India: The concept of ICT in Education was started in India few years back and it became a very important part of our life. The potentialities of ICT has been increasing day by day as India possesses a great workforce and also an awareness has been there among the educationists , stake holders on the emerging role of ICT in the country. The idea of ICT integration has a sense of completeness by which all the main elements of a system are combined together in such a way that they together make a whole.

Various ICT tools used in the Classroom: Some of the major tools used in the teaching learning process are as:

- Computer Aided Isnstruction
- Computer Assisted Learning
- LCD projector
- Power Point Presentation
- YOU TUBE
- Video Conferencing
- Google Earth

Teachers can make use of smart boards by sharing their lesson plans and ideas with each other by way of internet. Email is the most popular web based media. Teachers can make use of Email for various purposes and specially for the purpose of delievering web based media. Discussion forum is the new on-line discussion group on many topics which have varied interest of communication. Maintaining a blog or adding an article to an existing blog is called blogging. The educational use of blogs is that the students of classroom can be informed , handouts can be posted and notices can be given.The impact of ICT on the overall development of the students can be very important. Based on the availability of ICT infrastructure it can be ensured that every student completes the projects of ICT.

IMPLICATIONS OF ICT

There is a common belief that the contributions of ICT to the changes in the teaching practices,

school changes and innovations. A large number of factor can work together to bring about a change in the teaching practices and innovations. The changes in pedagogy, curriculum and teacher training is more likely to result in a greater learning on the part of the students and produce more effective outcomes.

There is a great need to implement ICT in education from the school level itself. Some main implications as well as the advantages of using ICT in education are:

1. Technological, economical and scientific information as well global awareness to a large extent is developed by the use of ICT.
2. There is a great development of interpersonal skills as ICT leads to effective communication skills.
3. Innovative thinking is emerged as a result of the exposure of the students to the outer world and thus they can plan the results very effectively.
4. The process of learning becomes quite informal, student driven and not dependent on time. When individual contribution is fixed then the participation of the students is also ensured.

Recent Trends in Teacher Education: Due to the changing needs of the society now a major shift has been on the various aspects of education. Teachers should be very well aware of the right attitudes and values. Nowadays, the trends are towards inter-disciplinary approach in teaching. Simulate Teaching, Team teaching are the some new developments in teacher education. Apart from this action research also plays a great role in Teacher Education.

CONCLUSION

The system of ICT should be made a prerequisite for our education system which is the need of the hour. It should be made compulsory as the majority of the population of India is young and it is very essential that they should be provided with the right to education. Teachers play a critical role in using ICTs in their everyday teaching activities. A teacher may use the internet for research, a word processor for typing a piece of writing, a painting program for designing illustrations, PowerPoint for making a presentation, etc. Efforts have been made from both governmental as well as non-governmental platforms to enhance the infrastructure so that the modern telecommunication technologies serve all the segments of India.

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BARRIERS TO USE ICT IN TEACHING-LEARNING PROCESS

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Throughout the world there is awareness of the fundamental role of new Information and Communication Technologies in the field of education. Technology is now at the threshold of its maturity within all the sectors. An overview of the research in the value of using ICTs in teaching and learning process proved that the utilization of ICT has had a major influence on the teaching and learning process. On other words, ICTs had proved to be an effective tools for educational purposes, although it has extend and transformed the way students learn and teachers teach. The aim of this paper was to provide information on encouraging the desired improvement in the future teaching situation to those responsible for the integration of ICT in education. This paper indicates that teachers have a strong desire for the integration of ICT into education but that they encountered many barriers to it. The major barriers were lack of confidence, lack of competence, and lack of access to resources. Since confidence, competence and accessibility have been found to be critical components for technology integration in schools and colleges. ICT resources including softwareand hardware, effective professional development, sufficient time, and technical support need to be provided for teachers. No one component in itself is sufficient to produce good teaching. However, the presence of all components increases the likelihood of excellent integration of ICT in learning and teaching opportunities.

INTRODUCTION

Information and Communication Technologies (ICT) has been developing rapidly in recent years and opens new horizons in the field of education. Therefore, Learning to use new technology tools and taking major steps to change one's classroom practices will be a challenge for most teachers. The professional development of teacher educators is very important, because unlessteacher educators exhibit an effective use of technology in their own classes, it will notbe possible to prepare a new generation of teachers who effectively use the ICT for both learning and teaching in their classrooms. Freeman (1996) aptly says that teacher education is in some ways still an "unstudied problem" and the use and efficacy of ICT byteacher educators remains an area yet to be explored in detail. As a teacher, we must rely on strategies that must be used to integrate in the classroom. We must change our way of teaching based on several kinds of technological devices. To enable students to get by in all areas where they need ICT, it is necessary to inform them about these

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technological tools. Today, most young children are using technological tools. That's why it is important to attract the interest of students from multiple sources of reliable and organized. By the use of technology, students will be able to express their creativity.

The teacher is a key to improving learning with ICT. Teachers' attitude towards the use of technology in teaching and learning process is one of the main factors for achieving a meaningful use of computer technology in the field of education. Therefore, their attitudes towards computer can play an important role in the acceptance and actual use of computers. The teachers may encounter a number of difficulties. These difficulties are known as "barriers". A barrier is defined as "any condition that makes it difficult to make progress or to achieve an objective. These barriers are:

Problems Related to Teachers' In-service Training

The fact that teachers are not enough knowledgeable about innovative ICT-based methods and approaches brings up problems related to teacher training. Only one third of participant teachers (six teachers) stated that they received in-service training about ICT. The other twelve teachers did not have any professional formation about ICT. Another related problem is that the training given about ICT is mostly for general knowledge and skills. Interviewed teachers state that the in-service training they received did not include generally ICT-based methods and approaches for teaching. Within scope of in-service training only general skills of using ICT equipment were emphasized, without relating with teaching methods and content knowledge.

Lack of ICT Equipment in Classrooms:

The facilities of ICT equipment at institutions, particularly in classrooms environment, significantly affect the use of ICT-based methods and materials by teachers in their teaching practices. The issues related to lack of ICT equipment is the most important determiner of integration of ICT into teaching practice. Other problems related to ICT equipment also were observed. The Internet connection does not exist in the classrooms in most of the schools where the study was carried out. This is one of the most important obstacles against the use of web-based methods and materials for in-class teaching practices. The other important obstacle is that ICT equipment in classrooms is old; therefore there are inadequacies and breakdowns. Most of the teachers participating emphasized such problems.

Lack of the ICT-Based teaching skills

In general, participant teachers are not enough knowledgeable about innovative ICT-based instructional methods and practices. Therefore, the use of ICT-based equipment by teachers does not create a fundamental change in their teaching approaches and practices. They are not competent enough to implement ICT-based methods to their full potential. Teachers generally uses of tware programs like PowerPoint to prepare class presentations. On the contrary, they rarely use teachings of tware programs or innovative ICT-based methods and materials.

Teachers' hesitancy in integrating ICT

The attitudes of teachers towards technology greatly influence their adoption and integration of computers into their teaching. He also stated that, the teachers prefer to use the traditional method for teaching in their classroom because of their lack of motivation, acceptance and readiness towards the ICT integration and adoption in teaching and learning process. Interviews with the teachers

reveal towards the use of ICT are a major barrier for ICT integration and utilization in classrooms. The reported reasons such as listed below are the major obstacles for them to integrate ICT tools in their lessons.

(i) Focusing on syllabus and rushing to finish it.
(ii) Concentrating on fulfilling the teachers' tasks and responsibilities.
(iii) Students are matured enough, so they do not need audio or visual strategies for teaching
(iv) The belief that examination classes should not indulge themselves in ICT integration during the lessons.
(v) The thought that classrooms with large number of students are not suitable for ICT incorporation.
(vi) Difficult to manage students if ICT was used in the classrooms.
(vii) Oldor experienced teachers do not want to accept and adapt to the changes.
(viii) Oldor experienced teachers do not want to receive any training on ICT in order to improve their ICT competence.
(ix) Views of teachers that traditional methods are always effective ways.

Teachers' workload

The teachers stressed that workload is a major barrier for them to integrate ICT tools in the classrooms. The teachers said that they are over-loaded with administrative tasks such as preparation of report cards, making attendance reports, filling the record book and form. The teachers also do not wish to incorporate ICT tools because of their concentration on examinations and syllabi. Some teachers were afraid that they could not finish the syllabus in time. They also revealed that ICT is difficult to integrate in the classes which consist of large number of students. The teachers were burdened with the tasks of marking examination papers, students' exercise books and workbook

Problem related to Lack of Time

One of the factors that hinder the teachers' decision to integrate ICT was the availability of time. Out of 12 teachers, 4 teachers (33.33%) stated that lack of time was a barrier to integrate ICT in the classrooms. They felt that there was no time given for them to plan and to integrate ICT into the lessons since they were extremely busy in achieving the goals of syllabi. According to Dang (2011), the lesson preparation using ICT is time consuming because as the rule of thumb, one hour of ICT- enhanced lesson would require about 3 to 4 hours of preparation. Thus, the teachers faced problem either in preparing the lessons or in conducting the lessons within the limited time. Moreover, the teachers need additional time to set up all the ICT tools in the classrooms. So, the teachers felt that they could accomplish the required tasks during their lesson hours instead of setting up the ICT tools.

Teaching Experiences and Age

Several studies found that teaching experiences and age influence the successful use of ICT in classrooms. Similar findings can be found in research carried out by Gorder (2008) which was reported that teacher experience is significantly correlated with the actual use of technology. She discovered that effective use of computer was related to technological comfort levels and the liberty to shape instruction to teacher-perceived student needs. The older teachers with more experience in

teaching did not prefer to use ICT tools in their classes. In the past years, the educational system was entirely different as compared to this net era. The curriculum emphasized the traditional method in conventional ways such as the use of textbook learning, rote learning, spoon- feeding technique, rote memorization, and learning which is limited to the two covers of the books and the four walls of the room. Therefore, the teachers who were used to the traditional method did not desire to use the modern tools in their lessons. Besides, some older teachers critiqued themselves as too old to adapt to the new ICT tools and did not want to accept the new methods of teaching. It is clear that the older and more experienced teachers do not acquire the new skills because of their impatience and tenacity towards the technologies

CONCLUSION AND IMPLICATIONS

Teachers should be capable of forming and organizing their learning environment in non-traditional ways by merging the ICT with new pedagogy. Thus, trainings, motivation and encouragement should be given to the teachers in order to avoid their hesitancy in adopting ICT into their lessons. Teachers should develop their classroom management skills in order to control and involve the students in their lessons. Moreover, they should learn and acquire the innovative ways of integrating ICT to enhance teaching and learning process. The teachers who are rooted in the traditional method should accept the technological changes and need to develop their teaching professionalism. Meanwhile, sufficient training, flexible time and task arrangement for teachers are necessary in order to provide opportunities for them to incorporate ICT resources into their teaching. The schools should play an important role in reducing teachers' burden and workload by structuring the administrative tasks and teachers' tasks. According to the respondents' responses, the school management can hire clerks in order to manage the academic administrative tasks.

The changes and development of ICT are skyrocketing. The young have already mingled with this digital world. Therefore, the teachers should realize this reformation and should be more advanced than the students to perform along with the students' expectations. Future research could focus on more effective ways to overcome the barriers of ICT integration in education.

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LEARNING WITH ICT AT PRIMARY EDUCATION LEVEL: A REVIEW OF LITERATURE FROM THE PERIOD 2011-2020

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Information and Communication Technology (ICT) is a vehicle to enhance the quality of the education. As theworld is moving rapidly into digital media and information, the role of ICT in education is becoming more important in the 21st century. This study used secondary data available from the year 2011 onwards and reports of Ministry of Human Resource Development, Government of India were also examined along with prominent papers published in various journals.The study further revealed major barriers and challenges for the community and government for the adoption of the new technology into the education at primary education level. Key findings were proposed which were the significant enablers to overcome the barriers and challenges.

Keywords: *ICT, primary education, teaching and learning, primary schools, India.*

INTRODUCTION

About 20 years ago, I'd have said probably nothing. But as the years have gone by and technology has advanced, the role of ICT in education has become a major player in the delivery of teaching and learning and has transformed the education system as we once knew it. Let's rewind 20/25 years, back to when I was a little one at primary school. Handwriting and sums were done in our school books, teachers wrote on actual whiteboards or blackboards with chalk, the register was taken on paper and handed in at reception and being allowed to write with a pen instead of a pencil was a real achievement! Technology was sparse.

Now, don't get me wrong I'm not saying there wasn't a single PC in that building, but the point I'm trying to make is back then, ICT wasn't seen as anything but a rarity. Fast forward 20 years and the spectrum have totally changed. In today's educational landscape there's an abundance of digital and networked technologies in place. From the widespread use of interactive whiteboards and virtual learning environments, to educational computer games and an increasing reliance on the use of cloud-based technologies such as the internet, email and e-learning platforms. ICT and computing today is huge, so much so that it's even become part of the curriculum.

The Government of India has also announced this decade as a decade of innovation. Inference and critical thinking are needed for innovation. The basis of this technology can only be achieved at the primary level. Students who enter the school are very curious, creative and can learn a lot. At this level, the statement 'photos are worth more than a thousand words' is very true in the course of

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the course. By getting acquainted with ICT at an early stage of education, young people can share their thoughts about the future. Students who study at this stage have a lot of interest in cartoons. They understand more via animated photos. For example, the use of ICT to create the same environment for the education of children in primary school can significantly change the educational scenarios. Nursery students can teach by showing pictures, animals, fruit, etc. Students at this level can use ICT tools to listen to voices, sounds and movements of different animals and to learn many things. Language learning is also at this level. To know a new language at this age is easier than other levels. Multimedia projectors and computers can be used to learn pronunciation and pronunciation. Classes, poetry and lectures by leading scientists who are stored on computers or other ICT tools can also beeasily presented to students at anytime and anywhere. Such types of teaching and learning have long remained in the memories of children.

ANALYSIS OF BUDGETED EXPENDITURE REPORT BY MINISTRY OF HUMAN RESOURCE DEVELOPMENT

This report presented the details of the Plan and Non Plan expenditure budgeted by the education departments of the States/UTs and the Centre for various sub-sectors of Education. Major insights which were reported were –

- About 79% of the Central expenditure on education is under plan Expenditure whereas in the case of States/UTs it is only 23 % in the year 2015-16.
- Sector-wise Expenditure (Plan & Non Plan) on Education by Education Department when analysed for both Centre and States/UTs in the year 2015-16 revealed that Elementary Education accounted for 50.96% of the total expenditure on education in 2015-16, followed by Secondary Education, which was 30%. The share of University & Higher Education and Technical Education was 12.84% and 4.60% respectively. The following table indicates the Sector-wise Expenditure on Education by Education Department incurred by both Centre and States.

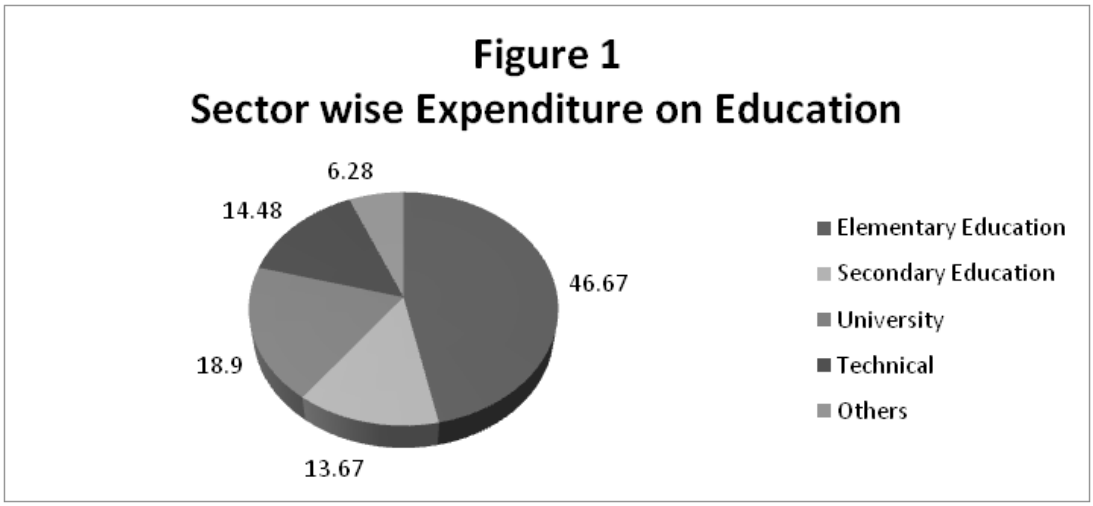
Table 1: Sector-wise Expenditure (Plan & Non Plan) on Education by Education Department (Revenue Account) with percentage-Centre and States/UTs 2015-16 (BE)

	Plan Expenditure	Plan %age share	Non-Plan Expenditure	Non-Plan %age share	Total Expenditure	Total %age share
Elementary Education	84639.79	60.56	136208.49	46.4	220848.28	50.96
Secondary Education	25783.63	18.45	104175.05	35.48	129958.68	30
Adult Education	1080.08	0.77	337.73	0.11	1417.81	0.33
Language Development	475	0.34	1586.81	0.54	2061.81	0.47
University & Hr. Education	15484.73	11.08	40178.12	13.69	55662.85	12.84
Technical Education	10397	7.44	9529.84	3.25	19926.84	4.6
General Education	1907.8	1.36	1558.3	0.53	3466.1	0.8
Total Education	139768.03	100	293574.34	100	433342.37	100

*Figures in crores

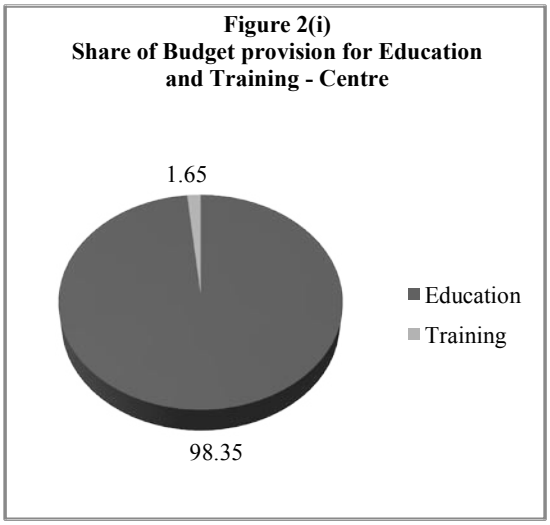
Source: Report of Budget Analysis by MHRD, GoI

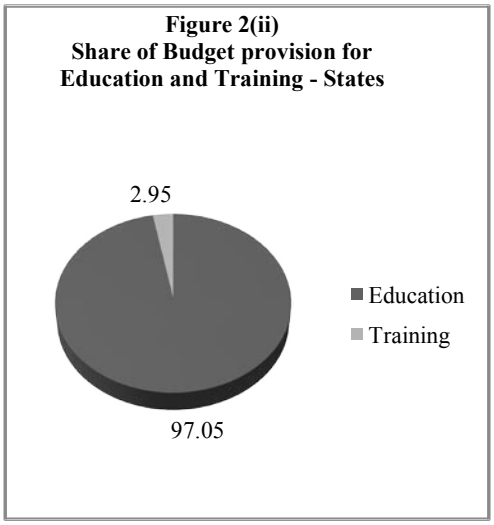
Data reported in figure 1 further indicates that in 2015-16, a major share of Rs. 32239.20 crore or 46.67% of the total budget of the Department of Education is provided for Elementary Education. The second priority is given to University & Higher Education (including DL & Student Finance) which is Rs. 16160.59 crore or 18.90%. The third priority is given to Technical Education which is Rs.10000.98 crore or 14.48%; Rs.9440.67 crore or 13.67% for Secondary Education.



Source: Report of Budget Analysis by MHRD, GoI

Data in the following two figures i.e. Figure-2(i) and Figure-2(ii) – pie-charts, show that meagre 1.65 percent of the total Centre Budget for Education spent on Training. The respective figure for States is 2.95 percent.





Source: Report of Budget Analysis by MHRD, GoI

It was observed that the share of budget in training is so meagre that it is not viable to train allthe teachers for adopting the new age ICT system in their curriculum. We need to organize the professional development conferences, workshops and seminars for teachers so that they are equipped with both pedagogical and technical skills on integration of ICT into primary science teaching. So, budget must be according to the needs of current scenario.

RELATED WORK

Ale, K., & Chib, A. (2011) investigated the influential factors that affect the introduction of technology in an Indian rural primary school. Primary data were gathered during one month of fieldwork in the Indian village of Pudur and Findings revealed that community factors that influence the adoption of ICTs in the rural education context can be translated into three claims: A provision for unbiased technology access to children; the need to maximize application of local language within technology and content; and equipping teachers with technological skills while creating positive attitudes toward technology adoption. Implications for the needs, training, and ownership factors were also discussed in the paper.

Roy, N.K (2012) pointed out four main challenges for the government for successful adoption of ICT in the schools located at rural India. First,providing the proper infrastructure facilities in schools with internet connectivity. Second challenge is the computer knowledge of theinstructors who are working in the schools. So, the instructors selected must be trained to acquire basic knowledge of computer and using the ICT in making the students understand the concepts. Third, and the most important aspect is involvement and interest of teachers, education department and the student community. These two things can be achieved through continuous motivation and creating the awareness about the importance of the ICT programmes. Fourth major challenge is monitoring and evaluation of the overall programme. This can be done by the concerned school education department. The government can alsoappoint suitable person to monitor the ICT Programme in schools.

Yuksel Goktas et al. (2013) in their empirical study identified the main barriers faced by primary school teachers in Turkey and proposed potential enablers to overcome those barriers. The results indicated that 'lack of hardware', 'lack of appropriate software materials', 'limitations of hardware', 'lack of in-service training', and 'lack of technical support' were the main barriers. The highest ranked enablers were 'allocation of more budget', 'allocation of specific units for peer support', 'allocation of support offices and personnel for teachers', and 'offering higher quality pre-service training for ICT'. Other leading enablers were 'supporting teachers to enable effective ICT use', 'having technology plans', 'offering higher quality and more quantity of in-service training', and 'designing appropriate course content/instructional programs'.

Patra, J. N., & Mete, J. (2014) highlighted enormous geographic and demographic disparities in the use of ICT in school education in India. Some states in the country had an enabling environment in place that allowed for a greater use of ICTs for education, whereas other states lack such an environment which made the use of ICTs for this purpose very sporadic. They also reported some barriers to make the school education completely ICT based. They are as follows-

- Lack of teacher's competency to handle ICT equipment's,
- Lack of infrastructures and equipment's and their connectivity
- Lack of interest in teachers and learners
- Lack of investigation for fruitful the schemes of ICT.

Kadam, M. U. B., & Kalyankar, M. T. R. (2017) highlighted that the creative use of Information and Communications Technology (ICT) in primary education has the potential to increase the quality of stakeholder's lives by enhancing teaching and learning but this needs a shift within the delivery and pedagogy employed in the present primary education system. They also observed that ICT can be used as a tool in the process of Primary education in four ways:

1. Informative tool: It provides informative data in various formats such as audio, video multimedia.
2. Situating tool: It creates situations, which the student experiences in real life. Thus, simulation and virtual reality is possible.
3. Constructive tool: To draw various pictures/images & colouring.
4. Communicative tool: It can help to enhance communication skill from childhood.

Sampath Kumar, B. and Shiva Kumara, S. (2018) observed digital divide in usage of ICT among the students from urban and rural origin in the state of Karnataka. The results of the study showed that only 20.66 percent rural students and 69.70 percent of urban students used computer for various academic purposes. Further, most of the rural and urban students stated that "electric power failure" and "lack of computer" skills were major problem in using computer.

Agarwal and Mittal (2018) highlighted the main issues related with the effective implementation of ICTs in all levels of education. They stressed on the issue of good quality content which has a direct impact on training and quality standards. The use of ICT for teacher training can also save a lot of government money. Overcoming specific problems related to the curriculum will also help a lot.In short, many quality improvements are possible after careful and conscious implementation of ICT by the various stakeholders in education.

Obaydullah, A. K. M., & Rahim, M. A. (2019) observed challenges in implementation of ICT in primary schools of Bangladesh and suggested the ways to enhance the integration of ICT in teaching and learning by primary school teachers. They suggested that appropriate teaching methodologies can be developed and adopted as well as the development of effective strategies, the care and maintenance of ICT resources need to be done. They felt that primary science teachers need resources and training on the use of computers and their application in teaching and learning in their subject to enable them to use various application software programs. They identified the need for internet connectivity to improve communication and collaboration amongst themselves so that teachers can be able to access learning materials, update software and content areas from various websites. Primary school teachers felt the need for preparedness for the new technological implementation in their schools and it can be addressed by professional development conferences, workshops and seminars for teachers so that they are equipped with both pedagogical and technical skills on integration of ICT into primary science teaching.

Das, K. (2019) observed use of ICT in Mathematics and concluded that ICT integration in Mathematics-education has a positive impact on both the teaching and learning process but with the improvement of certain aspects will enable to implement it in streamlined manner. Problems which are needed to overcome are –

1. Teachers don't have sufficient skill to develop digital Mathematics contents.
2. Powerpoint presentation (PPT) making is not an easy task which requires patience, time and money.
3. Poor ICT infrastructure in classrooms like computers, laptops, and overhead projectors.

4. ICT is not easy to apply to the Mathematics, application of Mathematics etc.

Shukla, A., & Yadav, B. K. (2019) highlighted four pillars needed for successful implementation of ICT in education in general. The four pillars were –

1. Technology and Network Infrastructure
2. Digital Content
3. Teacher's training
4. Local capacity and Community Support

The study further suggested that utilization of technology for imparting training at various levels is also a vital element of the Indian education system. This involves schemes such as train the trainer workshops. The growth in the education system is primarily initiated by individuals' passion for learning. When that passion for knowledge is subsequently supported by an innovative framework of ICTs, as well as prevailing governing policies, the education system has the potential for true and revolutionary change.

Indira, B., & Devi, D. L. (2020) studied students' response towards ICT based education among various schools and colleges in Hyderabad and observed that the demand for access to information and communication technologies (ICT) in education has increased sizably with the rise in living standards and the growing trend towards a knowledge based society. At the same time rapid developments in ICT have created many new opportunities to enhance the reach and spread of quality of education in an efficient and effective manner. ICT can enable teaching and learning from anywhere at any time hence, it is seen as an effective means to provide lifelong education opportunities to one and all.

Table 2: Summary of Studies related to ICT reviewed

S. No	Author	Title	Country	Year
1	Komathi Ale & Arul Chib	Community factors in technology adoption in primary education: Perspectives from rural India	India	2011
2	Niraj Kumar Roy	ICT –Enabled Rural Education in India	India	2012
3	YukselGoktas, Nuray Gedik, Ozlem Baydas	Enablers and barriers to the use of ICT in primary schools in Turkey: A comparative study of 2005–2011	Turkey	2013
4	Jyoti Narayan Patra & Jayanta Mete	The Role of ICT in improving the Quality of School Education in India	India	2014
5	Ministry of Human Resource Development, Government of India	Analysis of Budgeted Expenditure on Education 2013-14 to 2015-16	India	2016
6	Urmila Balasaheb Kadam & Trupti Ramchandra Kalyankar	Information and Communication Technologies (ICT) way to enhance standard of Primary Education	India	2017
7	B.T. Sampath Kumar, S.U. Shiva Kumara	The digital divide in India: Use and non-use of ICT by rural and urban students	India	2018
8	Department of School Education and Learning, Ministry of Human Resource Development, Government of India	Education Statistics at a Glance	India	2018
9	Ankur Kumar Agrawal and Girish Kumar Mittal	The role of ICT in higher education for the 21st century: ICT as a change agent for education	India	2018
10	A K M Obaydullah and Md Abdur Rahim	Use of ICT for Primary science Teaching and Learning at the Primary Schools in Bangladesh	Bangladesh	2019
11	Kaushik Das	Role of ICT for Better Mathematics Teaching	India	2019
12	Akanksha Shukla & Brijesh Kumar Yadav	A Study of ICT in Education: An Indian Prospective	India	2019
13	B. Indira and D. Lalitha Devi	Students response towards ICT based education among various schools and colleges in Hyderabad-A case study	India	2020

KEY FINDINGS

From the above discussion, it is clear that use of ICT for education is a horizontal activity that requires elements from different verticals to come together to enable meaningful learning experiences for the students. The following major aspects need to be addressed in a Policy for ICT in Education:

1. Technology and Network Infrastructure
2. Digital Content
3. Teacher's training and increase in central and state budget for training the teachers.
4. Local capacity and Community Support
5. Monitoring and Evaluation Framework
6. Implementation Plans
7. Political and Administrative support
8. Generating the interest of adopting ICT in teachers and students

CONCLUSION

Integration of ICT in education specially at the primary level is inevitable. We have seen lot of changes at the higher education level in the previous decade. Now it's the turn of moving the ship towards primary education level and budget reports of Ministry of Human Resource Development also reveals the same. In the coming years the thrust will be on the use of ICT to strengthen the system in the mode of recorded digital quality content, training the teachers through video conferencing, administrative support etc. Barriers which we need to overcome were hardware availability at the schools, lack of appropriate software materials, limitations of quality of content available, organizing the training for teachers, lack of technical and hardware support. By addressing the community factors such as interest of teachers and learners for their involvement and aligning implementation strategies to these considerations, ICTE initiatives have the potential not only to achieve the larger goal of improving the quality and access to education for all, but to improve the learning outcomes of children in developing countries. The urban-rural divide in terms of access, equity, and resources will continue to be the main issues that Indian educators will have to address as the needs of the learning community will change. Migration of rural Indians to urban areas is not the solution, rather, with health, education, a bit of infrastructure and livelihood opportunity, life in rural India may become better and more welcoming than that in urban areas.

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29

ROLE OF ICT IN QUALITY EDUCATION

*Jaswinder Singh**

ICT may be a scientific, technological and engineering discipline and management technique utilized in handling information, its application and association with social, economic and cultural matters (UNESCO, 2002). ICT stands for information and Communication technologies. ICT may be a a part of our lives for the previous couple of decades affecting our society also as individual life. ICT which is now broadly utilized in educational world? Teacher, Student,

Administrator and each people associated with education are popularly used ICT. Teacher use ICT for creating teaching learning process easy and interesting. A competent teacher has several skills and techniques for providing Successful teaching. So development and increase of skills and competencies of teacher required knowledge of ICT and Science & Technology. In modern

Science and technological societies education demands more knowledge of teacher regarding ICT and skills to use ICT in teaching –learning process. The knowledge of ICT also required for pre-service teacher during their training programmed, because this integrated technological knowledge helps a prospective teacher to understand the planet of technology during a better way by Which it is often applied in future for the betterment of the scholars. Now a day's ICT s are transforming schools and classrooms a replacement look by bringing in new curriculum supported world problems, projects, providing tools for enhancing learning, providing teachers and students more facilities and opportunities for feedback. ICT also helps teachers, students and fogeys to come together. Continuous and Comprehensive Evaluation (CCE) helps students also as teachers to use more technology for creating teaching learning more attractive for the betterment of our future generation. Teachers must know the utilization of ICT in their subject areas to assist the learners for learning more effectively. So, the knowledge of ICT is extremely much essential for the both prospective teachers also as in-service teachers also. This will help teachers to understand integrated technology with classroom teaching. This paper discussed about the role of ICT in 21st Century's teacher education.

Keywords: *ICT, Technology, Pre-Service, In –Service, Practice Teacher, Teacher Training.*

INTRODUCTION

We are living in 21st Century and it's also the age of data and technology (IT). Every aspects of life are associated with science and technology. Huge flow of data is emerging altogether fields throughout the planet. Now information and technology is popularly using in educational field for creating teaching learning process successful and interesting for college kids and teacher both. In

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1998, UNESCO World Education report refers about student and teachers must have sufficient access to enhance digital technology and therefore the internet in their classroom, schools, and teacher educational institutions. Teachers must have the knowledge and skills to use new digital tools to help all students achieve high academic standard. The standard of professional development of teacher education depends on the extent of ICT integration in teacher education programmed. consistent with UNESCO (2002) "ICT may be a scientific, technological and engineering discipline and management technique utilized in handling information, its application and association with social, economic and cultural matters".

Teachers are at the core of any living society. Technologies play a crucial role in training programmed of teachers. Students accesses knowledge and knowledge through TV, digital media, cable network, internet and social media i. e. Face book, Twitter, What's app, LinkedIn, , Line, We chat etc. ICT is extremely important for pre service teacher education programmed within the 21st Century. Without proper knowledge of ICT teacher cannot perform in his/her class room and it couldn't be said to be a complete one.

MEANING OF ICT

ICT Stands for "Information and Communication Technologies." ICT refers to technologies that provide access to information through telecommunications. It almost likes Information Technology (IT), but focuses totally on communication technologies. This includes the web, wireless networks, cell phones, and other communication mediums. In the past few decades, information and communication technologies have provided society with a huge array of latest communication capabilities. For instance, people can communicate in real-time with others in several countries using technologies like instant messaging, voice IP (VoIP), and video conferencing. Social networking websites like Face book allow users from everywhere the planet to stay in touch and communicate on a daily basis.

Modern information and communication technologies have created a "global village," during which people can communicate with others across the planet as if they were living nearby. For this reason, ICT is usually studied within the context of how modern communication technologies affect society.

The Promise of ICT in Education

For developing countries ICTs have the potential for increasing access to and improving the relevance and quality of education. It thus represents a potentially equalizing strategy for developing countries. [ICTs] greatly facilitate the acquisition and absorption of data, offering developing countries unprecedented opportunities to reinforce educational systems, improve policy formulation and execution, and widen the range of opportunities for business and therefore the poor. One among the best hardships endured by the poor, and by many others, who sleep in the poorest countries, is their sense of isolation. The new communications technologies promise to scale back that sense of isolation and to open access to knowledge in ways unimaginable shortly ago However, the truth of the Digital Divide—the gap between those that have access to and control of technology and people who do not—means that the introduction and integration of ICTs at different levels and in various sorts of education are going to be a most challenging undertaking. Failure to satisfy the challenge would mean an extra widening of the knowledge gap and therefore the deepening of existing economic and

social inequalities.

How can the utilization of ICTs help improve the standard of education?

Improving the standard of education and training may be a critical issue, particularly at a time of educational expansion. ICTs can enhance the standard of education in several ways: by increasing learner motivation and engagement, by facilitating the acquisition of basic skills, and by enhancing teacher training. ICTs also are transformational tools which, when used appropriately, can promote the shift to a learner-centered environment. Motivating to find out. ICTs like videos, television and multimedia computer software that combine text, sound, and colorful, moving images are often wont to provide challenging and authentic content which will engage the scholar within the learning process. Interactive radio likewise makes use of sound effects, songs, dramatizations, comic skits, and other performance conventions to compel the scholars to concentrate and get entangled within the lessons being delivered. More so than the other sort of ICT, networked computers with Internet connectivity can increase learner motivation because it combines the media richness and interactivity of other ICTs with the chance to attach with real people and to participate in world events. Facilitating the acquisition of basic skills. The transmission of basic skills and ideas that are the inspiration of upper order thinking skills and creativity are often facilitated by ICTs through drill and practice. Educational television programs like Sesame Street use repetition and reinforcement to show the alphabet, numbers, colors, shapes and other basic concepts. Most of the first uses of computers were for computer-based learning (also called computer-assisted instruction) that focused on mastery of skills and content through repetition and reinforcement. Enhancing teacher training. ICTs have also been wont to improve access to and therefore the quality of teacher training. for instance , institutions just like the Cyber Teacher Training Center (CTTC) in South Korea are taking advantage of the web to supply better teacher professional development opportunities to in-service teachers. The government-funded CTTC, established in 1997, offers self-directed, self-paced Web-based courses for primary and lyceum teachers. Courses include "Computers within the Information Society,""Education Reform," and "Future Society and Education." Online tutorials also are offered, with some courses requiring occasional face-to-face meetings. In China, large-scale radio-and television-based teacher education has for several years been conducted by the China Central Radio and Television University, the Shanghai Radio and Television University and lots of other RTVUs within the country. At Gandhi National Open University , satellite-based one-way video- and two-way audio-conferencing was held in 1996, supplemented by print-materials and recorded video, to coach 910 grade school teachers and facilitators from 20 district training institutes in Karnataka State. The teachers interacted with remote lecturers by telephone and fax.

NEED AND SIGNIFICANCE OF THE STUDY

The scenario of the classroom is changing. There's a technological gap between the progress of the society and instructional activities of the teacher within the classroom. If we see in our society on the one hand technology has revolutionized our society and on the opposite hand the teaching learning activities at college level have remained thus far away from technology. In our classroom the knowledge is imparted by the teacher in an ancient way, an educator centric mode which is most of the time boring and to not gain interest to the scholar. But present 21st Century's education is student centric education. Students learn from multi sources and for this reason use of

ICT & Multimedia are extremely much essential in educational field and simultaneously teacher's knowledge of ICT and Multimedia also required. So present study has great need and significance because this study shows roles of ICT teachers education.

Use of ICT in Teacher Education?

The classroom is now changing its look from the normal one i. e. from how to 2 way communications. Now teachers also as students participate in classroom discussion. Now Education is predicated on child centric education. Therefore the teacher should prepare to cope up with different technology for using them within the classroom for creating teaching learning interested. For effective implementation of certain student centric methodologies like project-based learning which puts the scholars within the role of active researches and technology becomes the acceptable tool. ICT has enabled better and swifter communication; presentation of ideas simpler and relevant way. It's an efficient tool for information acquiring-thus students are encouraged to seem for information from multiple sources which they're now more informed then before. So for this reason ICT is extremely much necessary for Teacher Education.

Novel Trends in Teacher Education:-

Based on various changing needs of our society now emphasis is additionally given to the varied educational theory and academic practices. Consistent with these theories and practices changes also are undergo in teacher education also. It's natural that teacher education must include new technology. Teachers should also know the proper attitudes and values, besides being proficient in skills associated with teaching. As we all know the minimum requirement of any training programme is that it should help the trainee to accumulate the essential skills and competencies of an honest teacher. Now days modern trends in teacher education are IDA (Inter-disciplinary Approach), Correspondence and, orientation courses etc. Simulated Teaching, Micro Teaching, Programmed Instruction, Team teaching also are utilized in teacher education. Today Action Research also implemented in Teacher Education. ICT acts because the gateway to the planet of data and helps teachers to be updated. It provides awareness of innovative trends in instructional methodologies, evaluation mechanism etc. for professional development.

Different Strategies for applying ICT in Teacher Education:-

1) Providing adequate infrastructure and technical support.
2) Applying ICT altogether subjects.
3) Applying new Pre-service teacher Education curriculum.
4) By using application s/w, using multimedia, Internet ,e-mail, communities, understanding system software.

ROLE OF ICT IN 21ST CENTURY'S TEACHER EDUCATION

The use of ICT is very helpful for teachers in both pre & in-Service teachers training.

1. ICT helps teachers to interact with students.
2. It helps them in preparation their teaching and provide to them feedback.
3. ICT also very useful for teachers to access with institutions and Universities, NCERT, NAAC, NCTE and UGC etc.

4. ICT also very helpful in improve Teaching skill, helps in innovative Teaching.
5. It helps in effectiveness of classroom. It also helps in improving professional Development and academic management also as enhances Active Learning of teacher Trainees. it's now replacing the traditional technology. As we all know now-a day's students are always have competitive mind. So teacher must have the knowledge of the topic .this might be done through ICT.
6. ICT helps teachers in preparation for teaching. Soon introduce ICT in pre-service teacher education different methods and methods are applied. Different tools are used like processing, Database, Spreadsheet etc. Various technology based plans are wont to help the teachers for his or her practice teaching.
7. ICT prepares teacher for the utilization of their skills within the important classroom situation and also make students for his or her future occupation and social life.
8. ICT as a medium for teaching and learning. It's a tool for teaching and learning itself, the medium through which teachers can teach and learners can learn. It appears in many various forms, like drill and practice exercises, in simulations and academic networks.
9. ICT as a well-liked tool for organization and management in Institutions. Teachers must provide technological support to hunt out using movie, animation, simulation training which helped student teachers to provide model presentation. If the teacher is extremely equipped with technology, the scholar also will be equipped with technology. It removes the normal method of teaching and prepare teacher to use modern method of teaching.
10. ICT is plays a crucial role in student evaluation.
11. ICT is store house of institution because all educational information can safely store through ICT.
12. ICT helps Teacher to speak properly with their students. So ICT bridge the gap between teacher and students.
13. ICT helps Teacher to pass information to students within a really little time.
14. ICT helps Teacher to style educational environment.
15. ICT helpful for technical preconditions (infrastructure).
16. ICT helpful for designed learning situations which are needed for both vocational training and thus the training of future teachers (in the teacher training institutes).

THE BENEFITS OF USING TECHNOLOGY WITHIN THE CLASSROOM

This is vital to recognize that students are already interested and engaged in using technology, this creates many amazing opportunities for schools and teachers to need advantage of integrating some kinds of technology within the classroom and to make teaching and learning simpler. Here are kind of the foremost benefits of using technology within the classroom.

1. Improves engagement: When technology is integrated into lessons, students are expected to be more interested in the themes they're studying. Technology provides different opportunities to make learning more fun and enjoyable in terms of teaching same things in new ways. as an example , delivering teaching through gratification, taking students on virtual field trips and using other online learning resources. What's more, technology can encourage a more active participation within the training process which can be hard to understand through a typical lecture environment.

2. Improves knowledge retention: Students, who are engaged and interested in things

they're studying, are expected to possess how better knowledge retention. As mentioned before, technology can help to encourage active participation within the classroom which is additionally a very important factor for increased knowledge retention. Differing types of technology are often used to experiment with and choose what works best for school kids in terms of retaining their knowledge.

3. **Encourages individual learning:** No one learns within an equivalent way due to different learning styles and different abilities. Technology provides great opportunities for creating learning simpler for everyone with different needs. as an example , students can learn at their own speed, review difficult concepts or skip ahead if they need to. What's more, technology can provide more opportunities for struggling or disabled students. Access to the online gives students access to a broad range of resources to conduct research in several ways, which successively can increase the engagement.

4. **Encourages collaboration:** Students can practice collaboration skills by getting involved in several online activities. as an example , working on different projects by collaborating with others on forums or by sharing documents on their virtual learning environments. Technology can encourage collaboration with students within an equivalent classroom; same school and even with other classrooms around the world.

5. **Students can determine useful life skills with the assistance of the technology:** By using technology within the classroom, both teachers and students can develop skills essential for the 21st century. Students can gain the skills they're getting to visit realize success within the end of the day. New trends of learning is about collaborating with others, solving complex problems, critical thinking, developing differing types of communication and leadership skills, and improving motivation and productivity. And more technology can help to develop more practical skills, including creating presentations, learning to differentiate reliable from unreliable sources on the online , maintaining proper online etiquette, and writing emails. These are vital skills which can be developed within the classroom.

6. **Benefits for Teachers.**

CONCLUSION

Teaching occupies an honorable position within the society. Information and Communication Technologies helps the teacher to upgrade the new knowledge, skills to use the new digital tools and resources. By using and acquire the knowledge of ICT, practice teacher will become effective teachers.ICT is one among the foremost factors for producing the rapid changes in our society. It can Change the character of education and roles of scholars and teacher in teaching learning Process. Teachers in India now started using technology within the category room. Laptops, LCD projector, Desktop, EDUCOM, Smart classes, Memory sticks are getting the common media for teacher education institutions. So we should always use information & communication Technology in Teacher Education in21st Century as because now teachers only can create a bright future for college kids.

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BEST TEACHING AND LEARNING PRACTICES WITH ICT

Vishal Singh & Dr. Satish Kumar***

This study aims to find out best teaching and learning practices with Information and Communication Technology or ICT. Teaching and learning is very complicating and well deliberated intellectual development. Best teaching and learning practices needs continuous propagation of ideas which helps in transferring of information from teachers to the students. Teaching and learning with ICT helps in enhancement of critical thinking, confidence and self efficacy. The role of ICT is very crucial as it is an indispensable means of improving teaching and learning. The impact of ICT on Teaching and learning has become pertinent as it promotes learning activity, maintained learning motivation and increased learning achievements of students. Teaching and learning becomes easy and interesting with the help of ICT. Presently Teaching and learning with ICT are transforming the educational institutions a new look by bringing in new programme of study based on real world problems, projects, providing tools for enhancing learning, providing teachers and students more services and chances for feedback. Teaching and learning with ICT helps teachers and students in their personal support viz. Knowledge, attitude and skills. Teaching and learning with ICT can bring desirable changes in education as well as uphold the progress of a nation.

Keywords: *Teaching and Learning Practices, Information and Communication Technology or ICT, The role of ICT and Impact of ICT.*

INTRODUCTION

There is advancement in technologies; the role of ICT becomes more crucial in the delivery of teaching and learning and it has also transformed the education system. In the present world there is tremendous advancement in the use of technology for teaching and learning process and use of ICT in educational sector is increasing day by day all over the world. The contribution of ICT in modification of teaching learning process as well strategies is uncountable.

ICT is a scientific, technological and engineering discipline and management technique used in handling information, its application and association with social, economic and cultural matters (UNESCO, 2002).

Tinto (2002), states that in developing countries the potentials of ICTs in increasing access and improving relevance and quality of education. ICTs greatly facilitate the acquisition and absorption of knowledge, offering developing countries unprecedented opportunities to enhance educational

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systems, improve policy formulation and execution, and widen the range of opportunities for business and the poor. One of the greatest hardships endured by the poor, and by many others, who live in the poorest countries, in their sense of isolation, and ICTs can open access to knowledge in ways unimaginable not long ago. ICTs force that has changed many aspects of the way we live. If one was to compare such fields as medicine, tourism, travel business, business, law, banking, engineering and architecture, the impact of ICT across the past two or three decades has been enormous.

The way these fields operate today is vastly different from the ways they operated in the past. But when one looks at education, there seems to have been an uncanny lack of influence and far less change than other fields have experienced. A number of people have attempted to explore this lack of activity and influence (eg.Soloway and Prior, 1996; Collis, 2002)

In Watson's (2001) description, ICTs have revolutionized the way people work today and are now transforming education systems. As a result, if schools train children in yesterday's skills and technologies they may not be effective and fit in tomorrow's world. This is a sufficient reason for ICTs to win global recognition and attention.

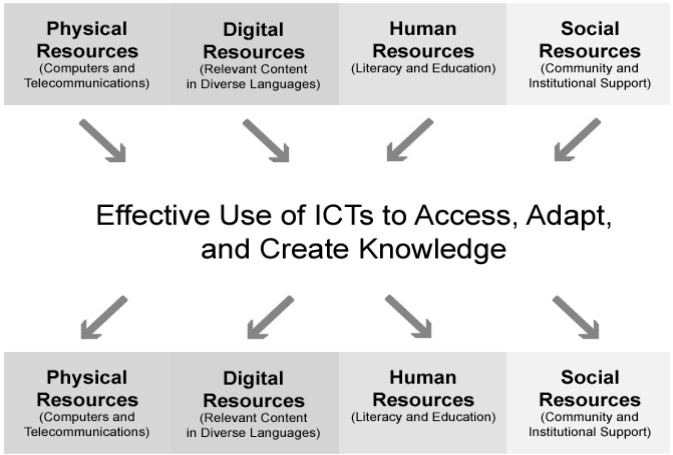
ICT that is broadly used in educational world also affect the society and individual life at a great extent. A successful teaching needs several skills and techniques that can be provided by ICT. A teacher must have knowledge of ICT and Science and technology for the development and increase of skills and competencies (Keane & Keane, 2014).

For instance, ICTs are dependable tools in facilitating the attainment of one of the Millennium Development Goals (MDGs), which is achievement of universal primary education by the year 2015.

COMPONENTS TO AN ICT SYSTEM

- Data: raw facts and figures.
- Hardware: physical components.
- Software: the name given to computer programs.
- Information: data that is converted to give it a meaning.
- Procedures: a series of actions conducted in a certain order to make sure the system runs smoothly.
- People: data is entered by humans, for example a keyboard.

RESOURCES OF ICT



OBJECTIVES OF ICT IN TEACHING AND LEARNING

- To make teaching and learning more easy and interesting.
- To provides skills and techniques to the teachers.
- To assist in searching for information, communication and the discussions between teachers and students.
- To use as a tool in educational intuitions as an advisory and training measures.
- To provide quality of teaching and learning with less stress to the lecture student.
- To increase the level of learning motivation.
- To improve the academic performance of students.
- To provide easy access to subject matter knowledge.

MAJOR ICT INITIATIVES IN INDIA

Saransh

With a vision to "Improve children's education by enhancing interaction between schools as well as parents and providing data driven decision support system to assist them in taking best decisions for their children's future", Central Board of Secondary Education (CBSE), has developed, a decision support system called 'Saransh'. This tool allows schools to identify areas of improvement in students, teachers and curriculum and take necessary measures to implement change by comparison of results. The mobile App for Saransh has been launched by Hon'ble HRM on 7.11.2015 at the National Conference on ICT. This will enable the parents and students also to look at and compare their results vis-a-vis school, state and national level.

E-Pathshala

E-Pathshala has been developed by NCERT for showcasing and disseminating all educational e-resources including textbooks, audio, video, periodicals and a variety of other print and non-print materials through website and mobile app. The platform addresses the dual challenge of reaching out to a diverse clientele and bridging the digital divide (geographical, socio-cultural and linguistic), offering comparable quality of e-contents and ensuring its free access at every time and every place. All the concerned stakeholders such as students, teachers, educators and parents can access e-books through multiple technology platforms i.e. mobile phones (android, ios and windows platforms), and tablets (as e-pub) and on web through laptops and desktops (as flipbooks).

Shaala Sidhdhi

The National Programme on School Standards and Evaluation (NPSSE), known as Shaala Sidhdhi is a comprehensive instrument for school evaluation leading to school improvement. Developed by the National University of Educational Planning and Administration (NUEPA), it aims to enable schools to evaluate their performance in a more focused and strategic manner and facilitate them to make professional judgments for improvement. The programme's objective is to establish and refer to an agreed set of standards and to provide clear pathways for each school for self evaluation, by focusing on key performance domains and their core standards for school evaluation. The structure of the Framework is simple yet flexible and lends itself to both self and external evaluation.

GIS Mapping

- To ensure universal access to schools including secondary schools within a reasonable distance of any habitation, the Geographic coordinates of school along with the school information available in UDISE is being uploaded on the school GIS Web enabled platform i.e. http://schoolgis.nic.in.
- All states have conducted GIS mapping and shared geographical coordinates of schools with the NIC except the State of Jammu and Kashmir. This mapping has been linked to the UDISE data base to ensure that every school is mapped and is backed by a detailed school report card based on UDISE information. This effort of developing web enabled platform about school information (Spatial and Non Spatial data) will add to the quality of planning and better utilization of resources available under SSA and RMSA.

INFLUENCE OF ICT ON TEACHING-LEARNING PROCESS

- ICT helps in better way to preparing lesson/projects / research papers than that of textbooks.
- ICT brings significant changes to bring the students more close to the teachers and both can participate in learning process.
- The modern teaching and learning system is inactive without the use of ICT.
- Teaching –learning cannot become developed without ICT and it also helps us to make pace with the modern education system.
- Learning becomes easier if we can visualize it, so ICT can make the difficult subjects easy for the students.
- Students become more attracted to the classes as they will be able to learn easily trough the help of ICT.
- Students can assess information directly by the help of ICT.

ROLE OF ICT IN TEACHING AND LEARNING PRACTICES

- ICT helps teachers' interact with students.
- ICT helps to identify the creativity of students.
- ICT helps to create students friendly environment.
- ICT helps in removing the gap between teachers and students.
- ICT makes teachers communication with students more effective.
- Students can be evaluated more effectively with the help of ICT.
- ICT helps the educational institutions to storing and easily retrieval of the information.
- ICT helps in understanding the concept in more effectively with the use of presentation, animation, motion pictures etc.
- It makes the teaching more innovating.
- It acts as a medium through teachers can teach and learners can learn.
- Teachers and learners can learn from their own networks with the help of ICT.

BARRIERS OF USE OF ICT

- Lack of pedagogical models on how to use ICT for learning.
- Lack of flexibility due to time constraint and overload of work.
- Insufficient number of the interactive whiteboard or any other educational software.

- Insufficient number of internet connected computers.

CONCLUSIONS

- ICT cannot be predicted by cultural and school factors.
- ICT helps in making pre-service teachers as passive learners.
- ICT can be a way or barrier for students to gain success in learning English. It can support students' learning success through promoting learning activity, nourishing motivation, and elevating learning achievement.

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31

WHAT FACTORS SUPPORT OR PREVENT TEACHERS FROM USING ICT IN THEIR CLASSROOMS?

*Ms. Jyoti**

The use of information and communication technology (ICT) such as Internet application, CD-ROMS, Video Technologies and various computer attachments and software programmes have caused many changes in society as well as in field of education. Teaching profession has also been affected by the dimensions of ICT. Uses of ICT in teaching and learning process involve a number of senses and thus it can be a potential tool for enhancing teaching and learning process. It has many advantages over the traditional teaching and learning approach. However, every new technology brings with positive and negative impacts and it cannot be a substitute of good teacher and it has to be properly and judiciously used by the teacher and learner to take the benefits. The factors which were found to be most important to teachers in their teaching were: making the lessons more interesting, easier, more fun for them and more diverse, more motivating for the pupils and more enjoyable. Additional more personal factors were improving presentation of materials, allowing greater access to computers for personal use, giving more power to the teacher in the institution, giving the teacher more prestige and providing professional support through the Internet. The purpose of this paper is to report on the supportive or preventive factors which have contributed to the continuing use of ICT by experienced ICT and ICT teachers in their teaching.

Key-Words: *ICT (Information and communication technology), professional support, supportive or preventive factors.*

INTRODUCTION

As Uganda adopts Information and Communication Technology (ICT) in education, it faces the same challenges like most developing countries where unstable economy, poorly developed ICT infrastructure, high bandwidth costs, unreliable supply of electricity, general lack of resources etc, were found to be the central issues to meet a broad spectrum needs of the country. Like other factors improper use of ICT in the classroom teaching-learning is a very important factor to be considered in the educational context of Uganda. ICT provides opportunities for teachers and students to operate, store, manipulate, and retrieve information, encourage independent and active learning, and self- responsibility for learning, motivate teachers and students to continue learning even outside school hours, plan and prepare lessons, design materials and facilitate sharing of resources, expertise and advice.

In fact, innovative use of ICT can facilitate student centered learning. Hence, every classroom

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teacher should use learning technologies to enhance their student learning in every subject because it can engage the thinking, decision making, problem solving and reasoning behaviors of students.

ICT (Information and Communication Technology)

ICT is an acronym that stands for "Information Communications Technology". ICT refers to technologies that provide access to information through telecommunications. It is similar to Information Technology (IT), but focuses primarily on communication technologies. This includes the Internet, wireless networks, cell phones, and other communication mediums.

In business, ICT is often categorised into two broad types of product:

1. Traditional computer-based technologies (things you can typically do on a personal computer or using computers at home or at work)
2. Digital communication technologies (which allow people and organisations to communicate and share information digitally)

RESEARCH METHODOLOGY

This paper is based on secondary data. The data and information has been collected from Journals, books and websites.

Learning and Teaching Classroom Environment

The learning environment has a physical as well as a relationship dimension. Physically it may be in a room full of particular furniture and equipment. Curriculum materials such as books and videotapes may also be present. The curriculum also has a place in the relationship dimension of the environment in that, students and teacher(s) are focused on certain processes and content in the curriculum. They also relate with that curriculum and the methodologies that are associated with conveying the curriculum. Learners and teachers may have very different relationships with different components of the curriculum as exemplified in Fig. 1(a).

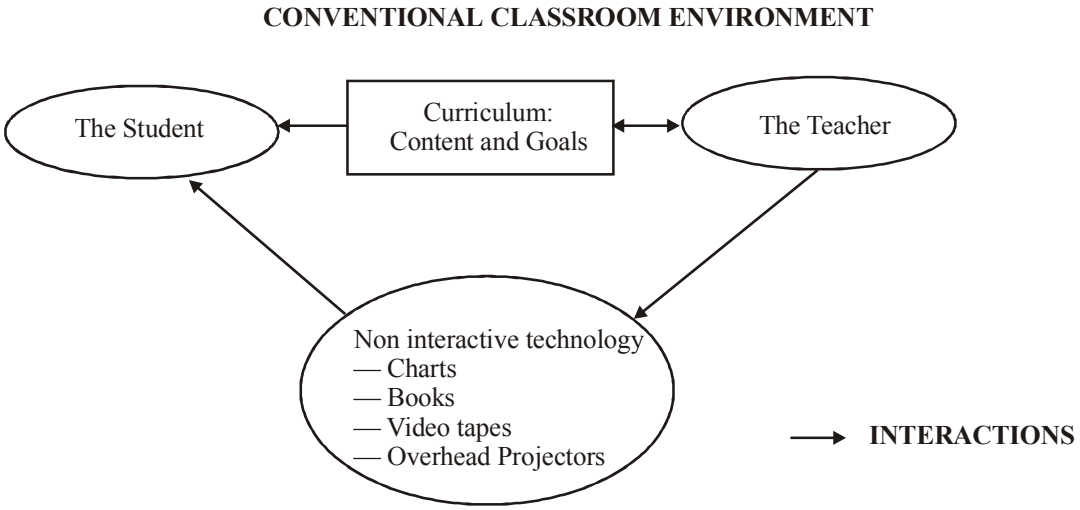

Figure 1(a): Conventional Classroom learning and teaching environment

The place of computers in learning is most likely to occur in the classroom in the school and at home. Most experts in the field of educational computing characterize computers as interactive and place them within the relationship structure of the ICT enhanced classroom-learning environment. The classroom learning environments that incorporate computers or ICT is demonstrated in Figure 2 (b).

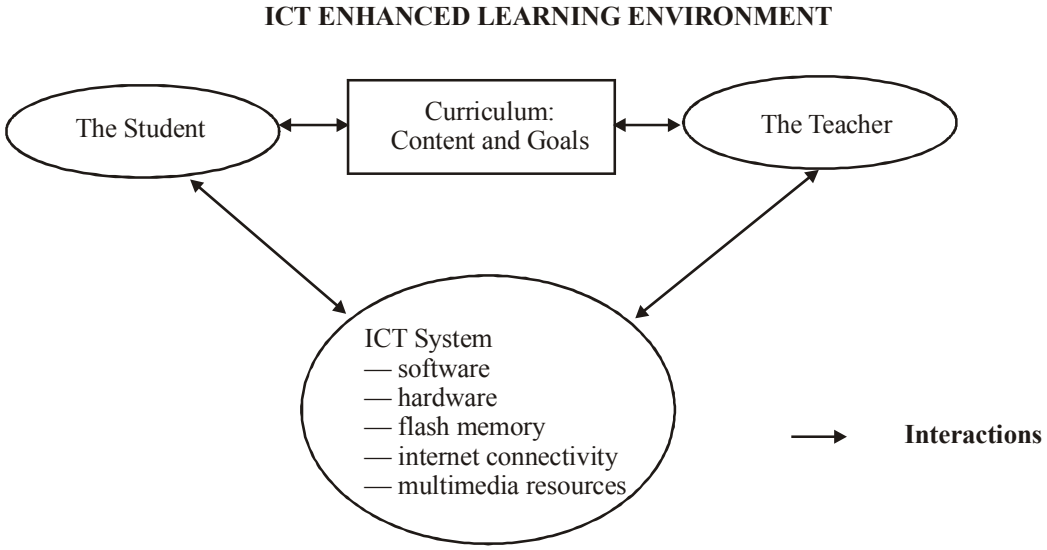

Figure 2 (b): ICT enhanced learning and teaching classroom environment.

Factors Support or Prevent Teachers from Using ICT in their Classrooms:

A. Education institution environment:

- location - rural, urban and semi urban.
- computer lab in terms of lighting and ventilation.
- mode of interest connection
- supply of electricity

B. Access to ICT infrastructure:

- number of functioning computer
- internet connectivity and information resources
- cost of ICT infrastructure
- Availability of subjects software

C. Teachers and learners training in ICT skills and use of ICT in learning and teaching:

- Appropriate ICT skills
- Time for practice
- Types of ICT system trained in
- Training in the use of digital material
- Attitude towards use of ICT
- Duration of training
- Use of computer before and after implementation of programmes

D. Government policy on ICT :

- National policy on ICT
- Provision of infrastructure
- Education system
- Cost of ICT infrastructure

E. Teachers:

- Use of computer application System for teaching
- Use of computer technical skills
- Use computers as a teaching tool

To establish how the school environment influences the use of ICT in the teaching and learning. The independent variables in objective one are the location of school, mode of Internet connection, power supply and physical environment inside the computer laboratories while the dependent variable is use of ICT in teaching subjects. The operational definition of the independent variables in objective one are follows:

(i) Location of school: Refers to the geographical location of the schools. This is operationalised as the urban schools, semi-urban schools and rural schools. In the study, the hypothesis is tested so as to find out the influence of location of schools on use of ICT in teaching and learning science subjects. The assumption is that secondary schools located in urban areas have higher chances of accessing electricity, Internet, modem computer laboratories and better support from school principals hence they able to integrate ICT in teaching science subject more effectively.

(ii) Mode of Internet connection: Refers to the means by which schools connect to the Internet. It assumed that since the Internet is a source of a lot of e-learning science materials and collaborative learning in a school its availability will therefore influence its use for teaching and learning.

(iii) Power supply: Refers to a source of regular supply of electrical power to a circuit or device that must be operated within certain power supply limits. The assumption of this was that even if all other ICT infrastructures were in place without electricity, learning using ICT will not take place and that science teachers will therefore most likely revert to the conventional mode of teaching (chalk and talk).

(iv) Physical factors inside computer laboratory: Refers to the physical condition of computer laboratory in terms of Lighting, ventilation, furniture and noise level. The assumption of this study was that computer laboratory which had good lighting, well ventilated, good furniture and reduced noise would influence use of ICT teaching and learning.

(v) Use of ICT in teaching subjects: Refers to the frequency teachers use various ICT tools in teaching subjects as reported by the respondents. It is assumed that teachers use ICT as a teaching tool if other ICT related factors are met.

To determine how access to computers and other ICT infrastructure (including multimedia facilities) affect the use of ICT in the teaching and learning strategies. The independent variables considered include the number o f working computers, network connections, availability of file server, teacher's ability to use the multimedia and students access to ICT skills. The dependent variable is the use o f ICT in teaching science subjects. The indicators of the dependent variable and the independent variable are operationally defined as follows:

(i) Number of working computers: Defined as the number of computers which could be shared by learners during ICT based subjects. It was assumed that availability of working computers would influence use of ICT in teaching subjects.

(ii) Computer networks: Refers to a group of computers that are interconnected by electronic circuits or wireless transmissions of various designs and technologies for the purpose of exchanging data or communicating information between them or their users. The assumption made in this study is that availability of computer network will influence use of ICT in teaching subjects since some digital materials are normally installed in one machine and shared to other machines through local area network.

(iii) Availability of file server: Refers to a computer running a server operating system capable of providing services to other computers in a network. The assumption for file server was that since file servers are used to installing digital materials which is shared to other computers, lack of it may impend effective use of ICT.

(iv) Computers sharing ratio: Refers to the number of students sharing one computer at the same time. It was assumed that for purposes of efficiency and effectiveness in using ICT in teaching curriculum in schools, computers for both teachers and students should be available most preferably at 1:1 ratio so as to increase learner's concentration and capacity to absorb all learning materials thus positively influencing use of ICT in teaching and learning.

To verify how the training of teachers and learners in ICT skills influences the use of ICT in learning and teaching. The independent variable is form of ICT trainings teachers and learners received, whereas the dependent variable is use of ICT in teaching and learning science subjects. The indicators of the dependent variable is use of ICT in teaching and learning and the independent variable includes access to ICT training skills, duration of training in basic ICT skills, teacher's technical competence and training in pedagogical skills are defined as follows:

(i) Access to ICT training skills: Refers to participation in ICT skills development programmes. The assumption for this was that training in acquisition of ICT skills could influence its use in teaching science subjects, as teachers are likely to have confidence in using ICT facilities in their schools.

(ii) Duration of basic training in ICT skills: This refers to the number of days the ICT training course took. The assumption was that the length of training period would increase conceptualization of the basic ICT skills and thus influence use o f ICT in teaching and learning.

(iii) Teacher's technical competence: This refers to the abilities of teachers to fix minor computer hardware and software problems. The assumption was that lack of technical competence would impede the effective utilization of ICT, since a lot of time would be lost as school seek for technical assistance which may not be forthcoming thus influencing use of ICT in teaching and learning.

(iv) Training in pedagogical skills: Refer to knowledge that teachers develop with respect to their teaching methods. The assumption is that use of ICT in teaching subjects were influenced by abilities in various pedagogical skills.

Identify the role of ICT infrastructure providers in the use of ICT in teaching and learning:

(i) Role of infrastructure providers: Refers to the prerequisites ICT facilitation provided by NEPAD and Cyber e-Schools in terms of hardware and software in support for integration of

ICT in teaching and learning in schools. The assumption is that teachers from schools well ICT resourced will use ICT more effectively than resource-deprived schools.

(ii) Technical Support: Refers to the type and magnitude to support received by schools. The assumption was that the kind and magnitude of technical support received by school would influence the use of ICT in teaching and learning.

Positive impact of ICT on Learners:

1. Critical thinking skills developed
2. Cognitive skills developed
3. Improved Skills in computer applications
4. Use of internet and other Information resources
5. Acquire interactive collaboration skills
6. Communication skills of learners improved
7. Define problems and solutions
8. Motivate to learn subjects
9. Construct knowledge
10. Learners participation in virtual leaning programmes at international levels etc.

CONCLUSION

The factors which were found to be most important to these teachers in their teaching were: making the lessons more interesting, more fun for them and their pupils, easier, more diverse, more motivating for the pupils and more enjoyable. Additional more personal factors were improving presentation of materials, allowing greater access to computers for personal use, giving more power to the teacher in the institution, giving the teacher more prestige, making the teachers' administration more efficient and providing professional support through the Internet.

Information and communication technology is playing a significant role in education. ICT can make teaching and learning process more interesting and easier. Students are performing better using ICT tools rather than using traditional tools. In this 21st century an ability to work with ICT is becoming necessary in every field particularly in education. ICT and education is like two sides of same coin. It can help students to learn and teachers to teach more effectively. It is predicted that there will be many benefits for both the learner and teacher.

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ROLE OF ICT IN QUALITY TEACHING

*Komal Sharma**

This paper is a mere attempt to present a glimpse of meaning of ICT, its importance and its mandatory need for education, which is indispensable. ICT stands for INFORMATION AND COMMUNICATION TECHNOLOGY. These technologies include:

- *Computers*
- *The internet*
- *Broadcasting technologies*
- *Telephony*

One of the many challenges facing developing countries today is that of preparing their societies and governments for globalization and the information and communication revolution. Policy-makers, educationists, non- governmental organizations, academics, and ordinary citizens are increasingly concerned with the need to make their societies competitive in the emergent information economy. Globalization and innovations in technology have led to an increased use of ICTs in all sectors- and education is no exception. Uses of ICTs in education are widespread and are continually growing worldwide. It is generally believed that ICTs can empower teachers and learners, making significant contributions to learning and achievement. Of the teachers interviewed on the effectiveness of ICT in education majority of them felt that introduction and use of ICT adequately will be extremely effective in children's learning and achievement. However, current research on the impacts of ICTs on student achievement yields few conclusive statements, pros or can, about the use of ICTs in education.

Many teachers are reluctant to use ICTs especially computers and the internet. Some of the reasons for this reluctance include includes poor design, skepticism about the effectiveness of computers in improving learning outcomes, lack of administrative support, increased time and effort needed to learn the technology and how to use it for teaching, and the fear of losing their authority in the classroom as it becomes more learner-centred. In terms of using internet and other ICT as a resource for lesson preparation, most of the teachers interviewed,admitted to never or rarely using it, while very few used the internet to gather information sporadically or regularly.

Keywords: *ICT, computer, internet, world wide web, teleconferencing, radio, television.*

INTRODUCTION

To accurately understand the importance of ICT in education there is need to actually understand the meaning of ICT. ICTs are defined for the purposes of this primer, as a "diverse set of technological

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tools and resources used to communicate, and to create, disseminate, store, and manage information."

ICT permeates the business environment, it underpins the success of modern corporations, and it provides governments with an efficient infrastructure. At the same time, ICT adds value to the processes of learning, and in the organization and management of learning institutions. Technological developments lead to changes in work and changes in the organization of work, and required competencies are therefore changing. Gaining in importance are the following competencies:

- Critical thinking
- Generalist competencies
- ICT competencies enabling expert work
- Decision making
- Handling of dynamic situations
- Working as a member of a team and
- Communicating effectively.

In recent years there has been a groundswell of interest in how computers and the internet can best be harnessed to improve the efficiency and effectiveness of education at all levels and in both formal and non-formal settings. But ICT are more than just these technologies; older technologies such as telephone, radio and television, although now given less attention, have a longer and richer history as instructional tools. The use of computers and the internet is still in its infancy in developing countries, if there are used at all, due to limited infrastructure and the attendant high costs of access. Here, it is important to note that there are two very different aspects of ICT in education:

- One is teaching ICT itself, and
- The second is using ICT as augmented tool to the existing teaching methods which is more important; it will be very useful if the people study from MCSE, CCNA, Comp TIA, IBM and ctirix.

This second aspect can be extended further by making computers available to children at home for work and play both, so that the digital divided can be bridged and natural disadvantages of underprivileged children can be neutralized. This philosophy behind projects such as one laptop per child (OPLC). ICT is not just the bloom of the educational activities, but also it will be the secondary option to improve the effective and meaningful educational process.

The main purpose of the strategy for ICT in education is to provide the prospects and trends of integrating ICT into the general educational activities. There are some unavailable facts in the modern education;

First, the ICT has been developing very rapidly nowdays. Therefore, in order to balance it, the whole educational system should be reformed and ICT should be integrated into educational activities.

Second, the influence of ICT, especially internet cannot be ignored in our students's lives. So the learning activities should be reoriented and reformulated, from the manual source centered to the open source ones.

Third, the presence of multimedia games and online games by internet has been another serious problem that should be wisely handled by the educational institutions.

Fourth, the implementation of ICT in education has not been a priority trend of educational reform and the state paid little attention to it. Therefore, there should be an active participation, initiative and good will of the schools and the government institutions to enhance ICT implementation at school.

Fifth, the teachers should be the main motivators and initiator of the ICT implementation at schools. The teachers should be aware of the social change in their teaching activities. They should be the agent of change from the classical method into the modern one. They must also be the part of the global change in learning and teaching modification.

The following are the main aims and objectives of ICT implementation in education:

- To implement the principle of lifelong learning/education.
- To increase a variety of educational services and medium/method.
- To promote equal opportunities to obtain education and information.
- To develop a system of collecting and disseminating educational information.
- To promote technology literacy of all citizens, especially for students.
- To develop distance education with national contents.
- To promote the culture of learning at school.

DO ICTS HELP CHILDREN TO LEARN BETTER?

Evaluating technology projects is notoriously difficult. Even more so is the evaluation of educational interventions. School influence on pupil's academic or social outcomes explains only about 12 to 15 per cent of the variance, leaving 85 percent or more to be explained by the influence of factors such as the child's family background, lifetime experience, natural ability and so forth. Many early experiments with ICTs in classrooms were based on nothing more than enthusiasm. However, the growing emphasis on the need to show concrete benefits has led to more attempts to evaluate the impact of computers in classrooms. But evaluating ICTs in education is particularly hard, for a number of reasons. Even in schools that make extensive use of ICTs, the amount of time spent using them in class is still generally tiny in relation to the time spent using more traditional teaching tools, from blackboard and chalk to photocopied handouts. In Britain, children use ICTs for an average of 45 minutes a week in primary school and for one hour and 15 minutes in secondary school. In addition, technologies and the way they are applied both vary greatly from one school to another. Many, too, attempt to measure the effectiveness of ICTs against quantity measure-how many computers, how much ICT software, and so forth –instead of attempting to assess quality, by looking at the ways ICTs is developed in the classroom. One of the most thorough attempts to set out the measurement issues in the evaluation of ICTs in schools, published in April 2002, picked out there problems:

- "terms such as 'technology' and 'technology integration' mean different things to different people"
- "most of the measures used in evaluation are 'home gown'…..measures that directly measure the effects of each grant."

There is a tendency to focus more on short-term outcomes and effects, rather than seeing the interventions as part of a total package designed to change how school function."

CAN THE USE OF ICTS HELP IMPROVE THE QUALITY OF EDUCATION?

Improving the quality of education and training is a critical issue, particularly at a time educational expansion. ICTs can enhance the quality of education in several ways;

- By increasing learner motivation and engagement,
- By facilitating the acquisition of basic skills and

- By enhancing teacher training ICTs are also transformational tools which when used appropriately, can promote the shift to a learner-centered environment.

ICTs such as videos, television and multimedia computers software that combine text, sound, and colourful, moving images can be used to provide challenging and authentic content hat will engage the student in the learning process.

The teacher strongly felt that the visual aural combination if integrated judiciously with the textbook and syllabus, can work wonders in getting across abstract concepts and logics to the children in a short span of time. The potential of each technology varies according to how it is used. Haddad and Draxler identify at least five levels of technology use in education:

- Presentation
- Demonstration
- Drill and practice
- Interaction
- Collaboration

DOES ICT-ENHANCED LEARNING REALLY WORK?

The educational effectiveness of ICTs depends on how they are used and for what purpose. And like any other educational tool or mode of educational delivery. ICTs do not work for everyone, everywhere in the same way. It is difficult to quantify the degree to which ICTs have helped expand access to basic education. Since most of the interventions for this purpose have been small-scaleand under-reported. Further, as the head teacher of one of the schools added, anything has its "uses and abuses" and the same holds for ICT in education.

MOST EFFECTIVE FORM OF ICT IN EDUCATION

The use of videos came across as the most effective ICT component in our teacher interviews. It was stressed by those using and wanting to use videos in education that creativity in presentation is just as important as the use of innovative media. Educational videos now encompass multimedia CDs interactive games, flash and 3-D animation, slide-shows, videos books, digital story-telling and many other forms that imaginatively combine visuals with text and audio that can be delivered on a range of platforms. Following current discussion forums on ICT in education, it is seen that videos can be used in a range of learning environments, such as to enhance learning in classroom, train illiterate women on basis life skills, teach children from nomatic tribal communities, and encourage children to make their own video films on Vikramshila Education Resources Society Shikshak Sammelan 2009 local issues of concern. If ICTs are used, teachers and schools need capacity building as a visual alternative to textbooks. Teachers also identified obstacles like

1. The lack of computers
2. TV sets and
3. Video playback systems

In most schools and argued that a whole transformation is needed at the grassroots, requiring the collaboration of multiple agencies.

ICT AND TEACHER TRAINING

- Teachers are no longer dispensers of knowledge but proactive facilitators.

- Redefining the role of the teacher in the new information age.
- The quality of teachers as a predictor of student learning therefore the importance of teacher training is heightened- in this light what is the role of ICT as a tool facilitating teacher training Vikramshila Education Resources Society Shikshak Sammelan 2009, ICT for quality Education.
- Bringing teachers to ICT rather than taking ICT to teacher-relevance in developing nations.

Many teachers are reluctant to use ICTs, especially computers and the internet. Some of the reasons for this reluctance include:

- Poor software design.
- Skepticism about the effectiveness of computers in improving learning outcomes.
- Lack of administrative support,
- Increased time and effort needed to learn the technology and how to use it for teaching,
- The fear of losing their authority in the classroom as it becomes more learner-centered.

CONCLUSION

Therefore, this paper is an attempt to present the important issues that must be addressed by both pre-service teachers's education and in-service teacher professional development programs if schools and other educational institutions are to fully exploit the potential of computers and the internet as educational tools. A positive find is that all those teachers who are not well versed with the computer and other technology, expressed keen interest is undergoing training for the same they felt that if trained, they would be in a position to make use of resources available in the school.

Support of school administrative and, in some cases, the community, is critical if ICTs are to be used effectively. In addition, teachers must have adequate access to functioning computers and sufficient technical support. Shifting pedagogies, redesigning curriculum and assessment tools, and providing more autonomy to local schools all contribute to the optimal use of ICTs in education largely however, even where ICT is used in the classes, it is usually as an information sources and not a part of core learning process.

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ROLE OF ICT IN QUALITY TEACHING

*Vibhu Malhotra**

This article discusses the Roles of ICT in education. Information communication technologies (ICT) at present are influencing every aspect of human life. They are playing salient roles in work places, business, education, and entertainment. Moreover, many people recognize ICTs as catalysts for change; change in working conditions, handling and exchanging information, teaching methods, learning approaches, scientific research, and in accessing information. Therefore, this review article discusses the roles of ICTs, the promises, limitations and key challenges of integration to education systems. The review attempts in answering the following questions: (1) What are the benefits of ICTs in education? (2) What are the existing promises of ICT use in education systems of some developing countries? (3) What are the limitations and key challenges of ICTs integration to education systems? The review concludes that regardless of all the limitations characterizing it, ICT benefits education systems to provide quality education in alignment with constructivism, which is a contemporary paradigm of learning.

Keywords: *ICT*

INTRODUCTION

Operational definition of terms Information Communication Technologies

(ICT) in this review article refers to the computer and internet connections used to handle and communicate information for learning purpose.

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 .

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 The Role of Information communication FissehaMikre oriented dynamic learning environment) to facilitate out of class learning.

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 behaviourism view of learning.

Learner- centred learning environment: - is a learning environment that pays attention to knowledge, skills, attitudes, and beliefs that learners bring with them to the learning process where its

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impetus is derived from a paradigm of learning called constructivism. In the context of this article, it means students personal engagement to the learning task using the computer and or the internet connection.

ICTs are making dynamic changes in society. They are influencing all aspects of life. The influences are felt more and more at schools. Because ICTs provide both students and teachers with more opportunities in adapting learning and teaching to individual needs, society is, forcing schools aptly respond to this technical innovation. Tinio (2002), states the potentials of ICTs in increasing access and improving relevance and quality of education in developing countries. Tinio further states the potentials of ICT as follows:

ICTs greatly facilitate the acquisition and absorption of knowledge, offering developing countries unprecedented opportunities to enhance educational systems. One of the greatest hardships endured by the poor, and by many others, who live in the poorest countries, in their sense of isolation, and ICTs can open access to knowledge in ways unimaginable not long ago. In Watson's (2001) description, ICTs have revolutionized the way people work today and are now transforming education systems. As a result, if schools train children in yesterday's skills and technologies they may not be effective and fit in tomorrow's world. This is a sufficient reason for ICTs to win global recognition and attention. Even though ICTs play significant roles in representing equalization strategy for developing countries, the reality of the digital divide- the gap between those who have access to, and control technology and those who do not, make a huge difference in the use of ICTs. This means, that the introduction and integration of ICTs at different levels and various types of education is the most challenging undertaking. Failure to meet the challenges would mean a further widening of the knowledge gap and deepening of existing economic and social inequalities among the developed and the developing countries. Thus, the purpose of this review article is to discuss the benefits of ICT use in education, in the enhancement of student learning and experiences of some countries in order to encourage policy makers, school administrators, and teachers pay the required attention to integrate this technology in their education systems.

THE BENEFITS OF ICT IN EDUCATION

The uses of ICT is making major differences in the learning of students and teaching approaches. Schools in the Western World invested a lot for ICT infrastructures over the last 20 years, and students use computers more often and for a much larger range of applications. Several studies. With respect to introducing ICT technologies in schools, Olson (2000) advises to explore the following questions as bases for inservice teacher education. These are

(1) How can the theoretical ideas tested in practice?
(2) What does practice say back to these theoretical ideas?
(3) How is useful negative feedbacks obtained?
(4) What might be substantive talking points about the new processes? What is practical from a classroom perspective?
(5) What does talking about the new say about the nature of existing technology? Is it adequate?
(6) What scaffold needs for the next stage?

Firstly, student out comes such as higher scores in school subjects or the learning of entirely new skills needed for a developing economy. Secondly, we should consider teacher and classroom outcomes such as development of teachers' technology skills and knowledge of new pedagogic approaches as well as improved attitudes toward teaching. Finally, one has to consider other outcomes

such as increased innovativeness in schools and access of community members to adult education and literacy. The table below presents comparison of the traditional pedagogy and the emerging pedagogy of constructivism that fits to the use of ICT (particularly the computer and internet) to increase student involvement in learning. Moreover, ICT makes the learning less abstract and more relevant to their life situations. In contrast to memorization-based or rote learning, that is the feature of traditional pedagogy; ICT-enhanced learning promotes increased learner engagement.

Aspect	Traditional pedagogy	Emerging pedagogy for the information society
Active learning	Activities prescribed by teacher	Activities determined by learners
	Whole class instruction	Small group
	Little variation activities	Many different activities
	Pace determined by the programme	Pace determined by learners
Collaborative	Individual	Working in teams
	Homogenous groups	Heterogeneous groups
	Every one for him/herself	Supporting each other
Creative	Reproductive learning	Productive learning
	Apply known solutions to problems	Find new solutions to problems
Integrative	No link between theory and practice	Integrating theory and practice
	Separate subjects	integration between subjects
	Discipline based	Thematic
	Individual teachers	Teams of teachers
Evaluative	Traditional pedagogy	Emerging pedagogy for the information society

Active learning: - 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.

Collaborative learning: - 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

Creative learning: - ICT-supported learning promotes the manipulation of existing information and the creation of real-world products rather than the duplication of received information. **Integrative learning: -** 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.

Evaluative learning: - 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.

The discussion above clearly elaborates the role of ICTs in facilitating the pedagogy of schools in the information society. Generally, describes the **following functions of ICT** in education. ICT as object. It refers to learning about ICT. Mostly organized in a specific course. What is being learned depends on the type of education and the level of the students? Education prepares students for the use of ICT in education, future occupation, and social life.

- ICT as an 'assisting tool'. ICT is used as a tool, for example while making assignments, collecting data and documentation, communicating, and conducting research. Typically, ICT is used independently from the subject matter.ICT as a medium for teaching and learning. This refers to ICT as a tool for teaching and learning itself, the medium through which teachers can teach and learners can learn.
- ICT as a tool for organization and management in schools.

IMPLICATIONS OF ICT-ENHANCED EDUCATION FOR POLICY AND PLANNING

There is a common belief that ICTs have significant contributions to changes in teaching practices, school change and innovations, and community services. Thus, policy makers and project leaders should think in terms of input factors that can work together to observe the right impact of ICT in education. OECD's Education Committee meeting for instance endorsed a proposal for a new activity on ICT known as "Policy Challenges for Education". The meeting intended to identify and evaluate what education policy makers might do to better use ICTs in achieving improved educational out comes. The structure of activity focuses on two broad and related questions as follows:

1. What policies are required to ensure that investment in ICTs leads to educational out comes? This tries to understand how ICT can contribute to greater access to learning; to higher quality teaching; and to improved and more equitable learning out comes.

2. What impact is ICT having upon the operation of educational institutions and upon educational policymaking? This tries to reflect on issues such as institutional frameworks for school management; the regulatory structures for educational institutions and teachers' work arrangements. The need for linking ICT to education policies requires recognition. In reflecting the importance of technologies, education policies should focus in the following major points

(1) Education policies have to reflect alternate and new teaching paradigms that ICT can offer in terms of providing a more effective, relevant, and flexible mode of learning for the underprivileged and the general masses.

(2) Policies must take into account the retraining of teachers incorporating use of ICTs in education. Teachers should skilfully redesign learning environments so that students can transfer their newly gained ICT skills to other applications to use in an ICT rich environment.

(3) Most educational policies reflect the need for ICT infrastructure but they left out the need for local educational content. The development of instructional content-ware remains a neglected area, affecting investments in hardware and resulting in a heavy economic and educational loss.

(4) The focus of developing countries should be on how they use ICTs to compensate for the factors that are lacking in education, namely, well-trained teachers and the resources to pay for expensive equipment.

PROMISES OF ICTS USE IN DEVELOPING COUNTRIES

The goal of the program is to improve educational outcomes, economic opportunities, and global understanding for youth using information technology and new approaches to learning. Services provided by the program include:

- Feasibility studies and consultation on connectivity solutions and telecenter management,
- Internet connectivity for secondary schools in developing countries,
- School-to-school partnerships, as well as regional and global partnerships with public, private, and non-governmental organizations,

Moreover, few of ICTs **benefits** to the classroom and the education process mentioned in the document are that ICTs:- • Offer the opportunity for more student centred teaching, • Provide greater opportunity for teacher-to-teacher and student-to student communication and collaboration, • Give greater exposure to vocational and workforce skills for students, • Provide opportunities for multiple technologies delivered by teachers, • Create greater enthusiasm for learning amongst students, • Provide teachers with new sources of information and knowledge, • Prepare learners for the real world, • Provide distance learners country-wide with online educational materials • Provide learners with additional resources to assist resource-based learning. Furthermore, the document states ICTs to cover all the technologies used for holding and communicating information and their use specifically in education with overall policy goals of: • Producing ICT literate citizens, • Producing people capable of working and participating in the new economies and societies arising from ICTs and related developments, • Leveraging ICT to assist and facilitate learning for the benefit of all learners and teachers across the curriculum, • Improving the efficiency of educational administration and management at every level from the classroom, school library, through the school and on to the sector as a whole, • Broadening access to quality educational services for learners at all levels of the education system, and • Set specific criteria and targets to help classify and categorize the different development levels of using ICT in education.

SUMMARY AND THE WAY FORWARD

This review article attempts to answer questions on the roles of ICTs in education, existing promises, limitations and the challenges of its integration in education systems. Information communication technologies are influencing all aspects of life including education. They are promoting changes in working conditions, handling and exchanging of information, teaching-learning approaches and so on. One area in which the impacts of ICT is significant, is education. ICTs are making major differences in the teaching approaches and the ways students are learning. ICT-enhanced learning environment facilitates active, collaborative, creative, integrative, and evaluative learning as an advantage over the traditional method. In other words, ICT is becoming more appropriate in the realization and implementation of the emerging pedagogy of constructivism that gives greater responsibility of learning for students. Several surveys are showing that ICT use in education systems of developed nations has comparatively advanced than ICT use in education systems of developing nations. In addition, the major promises of ICTs use in education systems of developing countries focus on training teachers in new skills and introducing innovative pedagogies into the classrooms, investing on ICT infrastructure for schools and creating networks among educational institutes, improving overall standard of education by reducing the gap in quality of education between schools in urban and rural areas, initiation of smart school with objectives to foster self-paced, self assessed, and self-directed learning through the applications of ICTs, and developing ICT policy for education and training. On the other hand, this article discusses the major limitations of ICT use in education as teacher related, student related, and technology related. In addition, the key challenges of ICTs integration into The Role of Information communication Fisseha Mikre education systems discussed relate to policy, planning, infrastructure, learning content and language, capacity building and financing.

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