# IMPORTANCE OF ICT FOR SOLVING THE PROBLEM IN SCIENTIFIC INSTITUTIONS

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*Abstract:* Uses of Information and communication technologies (ICT) have become prime education methodology changer technique to continue grow and develop in the 21st century. In India the uses of ICT tool has begun to have a presence but the influence has not been as broad as in abroad. ICT plays vital role in science stream by attracting learners through innovative ideas for teaching and learning. This paper shows how to overcome the problems comes when having use of traditional teaching methods by using ICT. This paper also argues the role of ICT in transforming teaching and learning and tries to explore how this will make a difference on the way programs will be offered and conveyed in the scientific institutions and colleges in the future.

**Keywords: Information and communication technologies (ICT), Outcome-based education, Education, scientific institutions.**

## INTRODUCTION

Information and communication technology (ICT) plays significant role to change the way we live. The acceptances and impact of ICT in all field e.g. tourism, medicine, travel, banking, business, law, engineering and architecture has been extensive over yours. The way of working has been totally change in all field with the use of ICT also reduce the man effort and working time. Now a days in scientific institutions the focus is mainly on changing teaching pedagogy to fulfill the objectives of Outcome-based education. ICT boost important parameters of Outcome-based education like enhancing the quality of education, improving lifelong learning, enlarging access to all levels of education etc.

In developed countries the use of ICT tools for teaching and learning has become common phenomenon for educational institutions. In teaching and learning process of science subjects as a medium of instruction ICT tools play vital role. [1]However, the domain like engineering and applied science related disciplines where graphical data plays significant role faces lot of problems at all levels of education institutions. Without ICT tools it has becomes difficult to teach and convey ideas, concepts and information to the learner. ICT can be taken into utilization to teach all subjects related to science and mathematics [2].

## GOAL

The particular goals of the study were to discover the factors affecting on adopting ICT require to strengthen the process of teaching-learning in scientific institutions and recognize the transformations made possible using ICT.

## FACTORS AFFECTING ON USE OF ICT IN SCIENTIFIC INSTITUTIONS

There are many components impacting on the utilization of ICT to strengthen teaching-learning in scientific institutions which include the following:

### *Professional development:*

The effective use of ICT in classroom for teaching-learning process is highly depends on faculty's professional development. Several studies shows that programs related to ICT increases computer competences of faculties [3] [4] and help to understand the importance of ICT in learning [5]. Faculties who adopt new teaching methodology complying ICT tools in their classroom teaching can able to transform the learner's performance [6].In scientific institutions where management arrange the professional development programs for faculties can result in change the view towards ICT of their stakeholder.

### *Teacher's attitudes:*

The factors which influence the penetration of ICT in teaching are teacher's faith in technology. If the belief is strong toward the use of technology then it can be easy to adopt ICT into teaching-learning process. Many studies shows that the use of ICT tools and attitudes toward them have strong relationship. Many theoreticians have noted that teacher's attitude has a strong impact on the technological integration in schools. The teachers with more experience with computers, the greater they will show positive attitude towards computers in educational practice.

*Computer Self-Efficacy:*

Self-efficacy is defined as capacity or power to produce a desired effect. According to research it has much more impact on ICT integration. In Hong Kong, a study suggests that the implementation of ICT by the teacher was based on the simplicity of computer use and self-efficacy [7]. Teachers feel futile to use computer if they possess less confidence [8]. The reasons for the low confidence for practicing ICT in teaching are fear of failure and lack of knowledge.

*Teaching Experience:*

Furthermore, studies were conducted to investigate the effect of teaching experience on the use of ICT in teaching and learning. However, the results suggested that it has very less impact on the use of computer technologies in teaching while majority of which represented that it has significant effect on the use of ICT in classrooms. In addition, studies witnesses that the effective use of computer technology enables comfort in adopting the teachers to perceive student's needs and refers to the teachers who deny the integration of ICT into routine teaching processes [9][10]. In the parallel universe, United States, the (U.S National Centre for Education Statistics, 2000) have reported that unexperienced faculties in teaching were eager to implement computers in their routine teaching than highly experienced teachers in teaching. It was mainly due to the newer generation is more advanced in using the computers.

*ICT Competence:*

Computer competence is the quality of being adequately or well qualified and intellectual. The teacher with computer competence has an ability to manage wide range of computer applications. It plays major role in integrating ICT in teaching. According to a study the teachers who denied the acceptance of ICT in teaching and learning process possesses inadequate skills and knowledge about computers. If the effective use of computers can be made, the ability and confidence of teacher can be easily ameliorated.

*Gender:*

As per the studies conducted, it was reported that gender has significant impact on the use of ICT. However, studies shows that teacher's gender and integration of ICT tool have scrutinized female faculties have low exposure to technology thus, they shows lack of interest. Study witnesses more number of male teachers using the ICT in their teaching and learning process than females. A study on teacher's integration of ICT in education in Queensland State resulted as, 929 teachers reported that female faculties were effectively using technology into their knowledge sharing less compared to the male faculties [11]. Whereas, there are few studies made which represents that gender variable was not the effective parameter for the implementation of ICT into teaching [12]. In a study, it was investigated that male teachers have keen interest towards computer skills before its implementation, however, after the implementation of technology the difference between male and females was eliminated to the most extent. Study also suggests that imparting quality techniques and keen interest towards adoption can eliminate gender inequalities.

*Standard of Education:*

A study [13] was carried out in Italy and Bermuda, shows that for limited purposes the use of computers has a major effect due to the level of education. Furthermore, the rise in proficiency of an individuals is purely based on the acceptance of computer and internet. As per the National Centre on Adult Literacy Technical Report (2005) [14], a study in Britain brought out that more educated people possesses good ICT skills, however it also indicate that whether the effect of education or employment is more significant on ICT skills or not.

*Availability:*

It enables easier to integrate ICT in routine education if one can easily access to the ICT infrastructure and equipment [15]. The core reason of adopting and integrating of ICT into teaching methodology in our education is accessibility and availability of resources like hardware, software, proper configuration, suggestive measures for the effective use of ICT. It is but obvious that lack of ICT tools and resources will unable to employ the awareness and importance of ICT in teaching and learning process. Moreover, availability of computers, hardware and updated software is the prime elements for the successful adoption and integration of the technology. A study shows that availability to technological resources is one of the most effective ways to teacher's pedagogical use of ICT in teaching [16].

## TRANSFORMATIONS IN SCIENTIFIC INSTITUTIONS BY ADOPTING ICT

The vast majority of the researcher firmly concurred that Information and communication technology tools have high impact in education and recognized transformations becomes possible by adopting ICT in scientific institutions which comprise following:

- With the help of E-learning, learner can study anywhere without attending college. This allow working people to enlist and redesign themselves effectively.
- By using ICT one can modify learning to the learners according their ability of understanding the course.
- Active learning through ICT tools gives more benefits to learners compare to traditional method of remembering the facts and giving the set of exams.

- ICT also provide a platform where one can share ideas or problems and others are try to think on improving those ideas and solving the problems.
- ICT boost rapidly the system of feedback and provide quick encouragement.
- It helps physically disable learner in teaching-learning of different subjects.
- Communication made effortless by using ICT tools like outlook, conference call, video call etc.
- The accessibility of data stored in the server or remote PCs becomes easy and quick by adopting ICT.
- Saving and retrieving of documents electronically reduced stress of keeping hardcopy.
- With the help of Internet researcher exposed himself to research community and remain in touch with key people around the globe.
- The quality of work in the office has been boosted by use of software and management information systems.
- It helps for faculties and administrators to enroll the learners online for eligibility test or unit test and to access their record online.
- It helps faculties to update the knowledge of subject domain by searching for newly available materials on internet.
- It made easy for scientific institutions to advertise for attracting the learners for courses and to inform career opportunity using ICT tools.
- ICT also helps to preserve the confidential data of faculties, researcher and administrators.

## CONCLUSIONS

The adoption of ICT tools in scientific institutions for teaching-learning process becomes remarkable in the 21st century. It is also becomes necessary to use technology in education for strong footprint among other organization. It can completely change the methodology of handling the data, sharing the information, interaction with learner, research approach etc. The difficulties faces in administration work can reduced significantly with ICT. The problem of understanding technical theories, fundamental laws, design concepts etc. to learner can solved by adopting ICT in scientific institutions. To obtain the true output of outcome based education concept in science and applied mechanics related area it should be must to adopt ICT tools at all levels in significant manner.

It can be concluded that in adopting ICT for teaching-learning process the factors influencing are Faculties' viewpoint, ICT Proficiency, Computer Self-Efficacy, Gender, Work Experience, Standard of education, Professional buildout, Approachability, Technical assist, Management assist, Force to adopt Technology, Controlling authority strategy on ICT literacy, Technological attribute. The chances of achieving true impact of ICT in teaching-learning process depends on the presence of all factors.

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