ICT Mediated Research in Education

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Research in education designates the systematic investigation; collection, organization and analysis of data; drawing inferences on the basis of findings and defining scope of further research in the concerned area. There has been a wide range of procedures, standards and techniques of research corresponding to various disciplines like literature, linguistics, sociology, anthropology, philosophy, psychology and other sciences. Outlining the aspects of educational research, Gary Anderson observes that research is based upon observable experience or empirical evidence. It employs carefully designed procedures and rigorous analysis. It requires competence in methodology and expertise in technical skill for collection and analysis of the data. The basis for educational research is the scientific method. Methodology systematically studies the research methods applied to a field of study. According to Blurton (New directions of ICT-use in education, 1999) ICT mediated instruction involves a technology channel or computers.[1] ICT based technique creates learning as "…the ability to retain, synthesize, and apply conceptually complex information in meaningful ways" [Lambert and McCombs (1999)].[2] Application of ICT in research serves to enhance critical analyzing skills and to present the research inferences and final conclusion in a comparatively more interesting and influencing way that is easier to understand for the common readers or learners. The web based environment is also conducive to gaining accuracy in result, processing of data in diverse forms and engrossing presentation of inferences drawn therein. Keeping in view the far-reaching impact of the use of computer technology, to integrate ICT in curriculum and methodology is the need of the hour. However there are certain obstacles, challenges and issues related to the integration of ICT in research. Despite these obstacles, ICT has "the capacity to diversify content and hopefully create a culture of lifelong learners." (Oliver Ron) Incorporation of information communication technology has revolutionised various sectors of socio-economic field including the higher education sector. The application of ICT in teaching learning process facilitates effective transmission of knowledge, greater access of information, more effective communication and interaction, enhanced cooperation and collaboration, development of linguistic skills and better pedagogical improvement. Earlier there used to be an emphasis on the content but now it has shifted to promote the competency and capabilities. "Curricula are starting to emphasise capabilities and to be concerned more with how the information will be used than with what the information is."[3] The use of ICT improves the overall level of education,literacy and knowledge among people immaterial of whence they belong to or what distant and backward area they are hailing from. The new practice of the establishment of language labs in higher education institutes is a milestone in history of teaching learning process. Keeping in view the far reaching impact of the use of Computer Technology, to integrate ICT in curriculum and methodology is the need of the hour. However there are certain obstacles and barriers in integrating these new technologies in higher education. There are challenges and issues related to the physical hindrances, the

adaptability of teachers and learners, accessibility, environmental issues and other similar factors. Despite these obstacles, ICT has the capacity to create a culture of life long learners. Information and communication technology has made its presence and significance felt in almost each and every aspect of human life, culture, knowledge, experience and education. Since last two decades the process of teaching-learning has registered a great influence and impact of computer technology. There have been revolutionary changes in the methods of teaching and learning.

At present, there is plethora of modern educational tools available for the teachers to use while bringing home a concept, theory or idea to the learners. Earlier there used to be an emphasis on the content but now it has shifted to promote the competency and capabilities. A teacher finds himself better equipped with modern teaching methodology incorporating tools such as LCD projector, audio-video recordings, CD ROM's, DVDs and PCs (personal computers), animation, e-mail, computer conferencing, audio-graphics, teleconferencing, multimedia products, and other off line and online web based applications. Integration of ICT makes teaching-learning student-friendly, interesting, innovative, captivating and thus in a way also helps to promote the culture of lifelong learning. Learning remains no more a boring, burdensome and heavy exercise but something satisfying, exciting and interesting with more and more participation of the learner. Play-way method, game-based learning and interactive practices are beautifully and effectively incorporated into the same.

ICT provides opportunities to access an abundance of information using multiple information resources and viewing information from multiple perspectives, thus fostering the authenticity of learning environments. ICT may also make complex processes easier to understand through simulations that, again, contribute to authentic learning environments. Thus, ICT may function as a facilitator of active learning and higher-order thinking.[4]

As compared to the old lecture method of teaching, ICT based teaching-learning yields better results as it widens the scope of individualization of learning. The students individually relate to the medium and its content. Further the interaction gives him the personalized attention and he needs to express his analysis, understanding and appraisal of the current topic. He can freely put forth his questions, observations and doubts and get his answers accurately.

Learning approaches using contemporary ICTs provide many opportunities for constructivist learning through their provision and support for resource-based, student-centered settings and by enabling learning to be related to context and to practice.[5] Another plus point of ICT based learning is that an electronic medium also gives an opportunity to the learners to revise and review the content at their own pace by reversing and forwarding the recording of the presentation. Becker (2000) found that ICT increases student engagement, which leads to an increased amount of time students spend working outside class.[6] As per their convenience, level of understanding and pace to grasp the matter they can pause a particular slide or page on the screen. By going backward they can easily refer to the earlier portion of the lecture for comparative analysis and others. This latest technology also improves the overall level of education, literacy and knowledge among people immaterial of whence they belong to or what distant and backward area they are connected to. According to Cabero (2001), "the flexibilization time-space accounted for by the integration of ICT into teaching and learning processes contributes to in increase the interaction and reception of information. Such possibilities suggest changes in the

communication models and the teaching and learning methods used by teachers, giving way to new scenarios which favour both individual and collaborative learning."[7] ICT incorporated learning also suits significantly to the distance learning programmes designed to cater to the needs of those curious learners who can not purse the regular courses of education due to several practical reasons. In this era of digitalization and globalization, he history of teaching and learning of English as foreign language has witnessed many changes in the matter, medium, methodology and assessment criteria among others. The new practice of the establishment of language labs, for instance, is a milestone in history of teaching-learning process. A teacher undoubtedly finds himself better placed in a language lab while explaining the working of parts of vocal system during speech production and in reference to the correct pronunciation of a word. Keeping in view the far-reaching impact of the use of Computer Technology, to integrateICT in Curriculum and methodology is the need of the hour.

EDUSAT programme in this series is an effort to promote learning and education through technology. "Government of India launched the Educational Satellite (EDUSAT) in September 2004, which is expected to revolutionize the Distance Education Programme in four states (Karnataka, Kerala, Madhya Pradesh and Maharashtra) for understanding the process and implication of Satellite based Education Programme in different sectors…(Later it was found that) the students have benefited from the video programmes delivered through the satellite. The benefit gained is in terms of gain in knowledge and understanding of the content, improvement in attendance and holding attention and interest in viewing programmes. The teachers' involvement during the broadcast as facilitator and conduct of pre and post broadcast activity is noteworthy."[8] Observing the above stated points, the ICT incorporated teaching-learning seems to be the ideal one but as teachers, we need to recognize and admit its limitations as well. There are many practical problems, challenges and issues which in a way impede the implementation of this technology in the field of education in different institutions. These issues are relarted to the physical hindrances, to the ability of the teachers and learners , the content of the lecture, accessibility, environmental issues and other similar factors. Firstly, there is the issue of infrastructure cost required for beginning and developing the ICT system in an educational institution. In fact in rural areas and the economically deprived backward areas there are more important issues to be addressed than the one of implementation of ICT. They have to prioritise their needs and requirements in the list of which the ICT based learning system is among the last ones. However after installation, comes the term of maintenance cost of the system. Frequent use of any machinery also leads to the requirement of maintenance and servicing form time to time. The computer labs like language labs, science labs, geography labs and similar others need proper care, maintenance and a full time lab-attendant as well. In certain case the manpower is not in proportion to the required number and quality of the same. Secondly the ICT education system offers a uniform content for all kind of learners – average, below average and bright ones – thus defeating in its purpose to some extent. The quality and level of lecture run the risk of not effectively meeting the requirement of the receivers. Because a class of students is far from a homogenous group of individuals. They are from different socio-economic backgrounds, with different levels of understanding and capabilities, with various inclinations and interests. While the general lecture integrating ICT may tend to offer general solutions without paying attention the local problems and socially and culturally sensitive issues. Moreover for the successful running of ICT integrated project, the providers and teachers need proper training & orientation. It entails understanding the need of

redefining of the teaching-learning process, flexibility, desire to learn, broad perspective, foresightedness, initiative-taking tendency, good level of motivation and progressive outlook. The trainers and teachers need to work upon their lecture in ICT based learning method. This is a widely prevalent myth that any kind of content concerning any area of knowledge is readily available on internet. It really takes time, effort energy, requires skill and creativity to develop a multimedia presentation and lecture. The teacher actually devotes a lot of quality time to select and sort the material from a web of different sites. At times the fonts of a local language are not easily available on net. Further for the implementation of ICT based education system, the ground support is also among the requisite logistics. Pondering over the role of ICT in 21st Century education, Ron Oliver observes in 'The role of ICT in Higher Education for the 21st century: ICT as a change agent for Education': "In comparison to others industries, such as medicine, architecture, tourism and engineering, education has not utilized ICT's potential to enhance learning and diversify education. Factors hindering the adoption of ICT in education have been a lack of finding support and a lack of training amongst established teachers. However we will see an increased prevalence of ICT in the near future as opportunity and ICT affordances emerge. This will impact on what is learned, how it is learned, when and where learning takes place and who is teaching and who is learning. This is very exciting as ICT has the capacity to engage a larger audience, diversify content and hopefully create a culture of life long learners."[9] That's why this latest technology is hailed as a paradigm shift in teaching learning process.

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