

Teaching and Learning with ICT Tools: Issues and Challenges in Higher Education in India

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Abstract: Higher education in India has gained momentum due to advancements in Information and Communication Technology (ICT). The ICT is the driving force for the successful delivery of quality education in higher learning. The last two decades have witnessed the inclusion of developments in ICTs in higher education systems around the world. Demand for skilled and competent manpower is increasing day by day in this modern globalized society. The Government of India is sponsoring students from primary level till to the higher education level but much needs to be done to make an educated nation that is technologically literate. Access to quality higher education has emerged as determining factor of economic growth and development. In order to increase the access to higher education and improving its reach to the remotest parts of the country, contribution of open and distance and online learning courses is on the increase. Presently higher education in India is experiencing a major transformation in terms of access to the ICT. In addition, it is catering to life-long learning aspirations and that too at affordable cost. Still in spite of many advantages and opportunities there are some uncertainties and challenges of using ICT in higher learning.

Keywords: Information and Communications Technology (ICT), Challenges, Barriers, Insight, Curriculum Communication, Digital India, Higher Education

I. INTRODUCTION

Nowadays, the use of technology as a tool to develop the different language skills has received great attention so that English language teachers are frequently exposed to new practices. Apart from curricular changes that come officially-usually from the Ministry of Education in each country- workshops and short trainings introduce new techniques and activities or promote new materials. Accordingly, English language teachers are accustomed to frequent subject innovations, but not necessarily more resourceful or open to new ideas. The use of technology devices, such as televisions, tape recorders and video recorders have been incorporated as a tool for language teaching since 1960s. There was evidence of many problems in terms of technical skills at the beginning, and it took about a generation for the technical skills and the technical problems to be ignored out. However, teachers are faced with some barriers that prevent them to employ information and communications technology (ICT) in the Manuscript received January 16, 2012; revised February 17, 2012 classroom or develop supporting materials through ICT. Therefore, this study aims to explore the high school English teachers' perceptions of the challenges and barriers preventing teachers from using ICT in the classroom.

II. LITERATURE REVIEW

The integration of ICT in teaching and learning is not a method; rather it is a medium in which a variety of methods, approaches and pedagogical philosophies may be implemented. This statement shows that the effectiveness of ICT depends on how and why it is applied and integrated. In 1980, Taylor stated that ICT usage is classified to tutor, tool and tutee. Tutorial programmes lead learners step-by-step through a programme such as drill and practice. Using technology as a tool can help other types of problems, for example, technology as a tool is frequently seen in tutorial or

explanatory programmes . ICT acts as a tutee where students programme the computers in order to gain more understanding. A number of different ICT tools and applications may be integrated in teaching and learning]. Some of these tools and applications may be designed specifically for educational purposes and some others for more general use. The choices of resources, and the way they are used, can be linked to different learning theories which may be invoked to explain or predict learning benefits from the use of ICT . Roblyer and Edwards believe that the use of ICT in education has evolved from two main approaches, namely directed and constructivist instructional methods . The theoretical foundations of directed instruction are based on behaviorist learning theories and information processing theory, which is a branch of cognitive psychology. The theoretical foundations of the constructivist approaches are based on the principles of learning derived from cognitive learning theory.

Pegu (2014) in his study “Information and Communication Technology in Higher Education in India: Challenges and Opportunities” examined the role of ICT in higher education in India. The study reported poor penetration of ICT programs in higher education and also due to the lingual diversities there are needs to create content in local/regional languages. Further, there are tremendous opportunities as these programs have high potential to achieve expected learning outcomes efficiently.

Chandha (2015) in her study titled “ICT & Present Classroom Scenario” presented her opinion on technological learning tools for learning. She described various ways to incorporate ICTs to the mainstream of classroom teaching and tried to ensure a positive approach towards the successful implementation of ICTs and suggested practical ideas to do so.

Deol (2015) in his research work on “Effectiveness of CAI Programs on the Achievement in Teaching of Social Studies” [5] tried to find out the effectiveness of Computer Assisted Instruction (CAI) programs on the achievement in the teaching of social studies. He took a sample of 50 students (both male and female) of 9th class of Sant Sundar Singh Public School of district Ludhiana (Punjab). He finalized the sample by conducting the Standard Progressive Matrices Test (developed by Raven) and the students whose scores were falling on average were taken. Then he randomly selected 14 students in the control and experimental group each and then conducted his research. He found that after the treatment of the CAI program to the experimental group, achievements of the experimental group were higher as compared to the control group. This implies that ICT programs had helped in better understanding of the content.

Kaur (2015) in her study titled “ICT Culture in Teacher Education” found that the transformation to technology embedded classrooms requires the transformation of teacher-training. Making student-educators aware of ICTs and assure their compatibility to innovative technologies, she suggested various types of inputs in teacher training such as knowledge of basic hard drive skills, understanding system software, using multimedia, introduction to open-source software, and social, legal, ethical and health issues etc. which worth implementation in teacher-training programs.

Sandhu (2015) in her study titled “Integration of ICT in Teacher Education” focused on the issues and concerns related to the integration of ICT in teacher education program. She arose a major issue that making teachers comfortable with innovative technologies is one of the major concerns to be considered as their comfortability will help integrate ICTs to the classroom teaching. For this purpose, teacher education should be transformed in order to prepare the teachers for changing scenarios.

Girish & Sureshkumar (2017) in their study “ICT in Teaching-Learning Process for Higher Education: Challenges and Opportunities” focused on the challenges and opportunities for implementing ICT in the classroom for teaching and learning process. They also concentrated on the circumstances which are needed to be converted in order to achieve the full potential of ICT programs for better teaching-learning. They found various challenges such as expensive cost, lack of essential infrastructure required for the complex operation of ICT enabled tools for learning, and unfulfillment of basic needs like electric supply, etc. But ultimately there are opportunities for implementation of ICTs as the learning outcomes with their help have improved significantly.

A study by Nakaznyi, Sorokina, and Romaniukha identify the insufficiently developed system of incentives for implementation of information and insufficiently developed regulations for the use of electronic tools in its local research but these issues can also be observed in Indian context as well.

Kundu et al. also list some of the very essential issues in their study which are: lack of trained teachers, lack of knowledge for the integration of ICT with school and higher education curriculum, poor administrative support, financial issues, time-management related problems, lack of the required infrastructure etc.

Crucial external barriers in the implementation of ICT -

Shortage of equipments- There is lack of computers and computer-related resources such as printers, projectors, scanners, etc. in government schools in rural areas. The ratio of computer per student is insufficient. The option of private schools is very few or missing in these regions. There is a mismatch between the complementing resources and inappropriate combination of ICT resources result into reduced diffusion of technology as well as poor ICT understanding in these educational institutions. **Unreliability of equipment-** Even the basic ICT equipments and computers possessed by rural schools are unreliable and undependable. The schools lack up-to-date hardware and software availability. Old and obsolete equipments are major hindrances to ICT adoption and application.

Lack of technical support- Rural schools face issues related to technical know-how, absence of ICT service centers, shortage of trained technical personnel. Whether provided by in-school staff or external service providers, or both, technical support specialists are essential to the continued viability of ICT use in a given school. Without on-site technical support, much time and money may be lost due to technical breakdowns. One of the major obstacle to optimizing computer use in schools has been the lack of timely technical support.

Resource related issues and internet- Rural schools usually face trouble with respect to the availability of ICT related resources such as supporting infrastructure, uninterrupted electricity, supplementary resources like multimedia, projectors, scanners, smart boards, and so on. Despite being an integral component of the ICT, internet is lacking in most rural schools. Most schools cannot afford the high fees charged by internet providers and even where there is internet, slow or erratic connectivity destroys the very essence and impact of ICT. Other external factors inhibiting the usage of ICT in rural schools are social and cultural factors inherent to these regions, lack of initiative by community leaders, corruption and burglary.

Revolution in information and communication technologies has reduced national boundaries to meaningless lines drawn on maps. In this scenario, education has been identified as one of the services which need to be opened up for free flow of trade between countries. India is developing as a knowledge economy and it cannot function without the support of ICT. The gap between demand and supply of education has necessitated the government and institutions to formulate policies for more beneficial use of ICT.

The integration of Information and Communication Technology (ICT) in Indian higher education has transitioned from a luxury to a functional necessity. Given the vast geographical spread and the diverse socio-economic background of students in India, ICT serves as a bridge for equity and quality. Here are strategic suggestions for the use of ICT tools in higher education, categorized by their functional impact:

1. Digital Infrastructure and National Initiatives

The Government of India has established several frameworks that institutions should leverage to enhance their academic reach:

SWAYAM (Study Webs of Active-Learning for Young Aspiring Minds): Integrating Massive Open Online Courses (MOOCs) into the regular curriculum allows students to earn credits from premier institutes like IITs and IIMs.

National Digital Library (NDL): Providing students access to millions of academic publications and journals for free, reducing the financial burden of expensive textbooks.

Virtual Labs: For science and engineering students, ICT tools can simulate expensive laboratory experiments that might not be physically available in every college, ensuring practical learning is not hindered by lack of equipment.

2. Pedagogy and Classroom Transformation

Moving beyond traditional chalk-and-talk methods, ICT can modernize the learning experience:

Learning Management Systems (LMS): Platforms like **Moodle, Canvas, or Google Classroom** help in organizing course material, tracking student progress, and maintaining a centralized repository for assignments and feedback.

Flipped Classrooms: Teachers can provide video lectures (via YouTube or institutional servers) for students to watch at home, while class time is dedicated to problem-solving, debates, and active discussion.

Smart Interactive Boards: These allow for the integration of multi-media content (3D models, simulations, and real-time data) directly into the lecture flow.

3. Assessment and Evaluation

ICT can significantly improve the transparency and speed of the Indian examination system:

Computer-Based Testing (CBT): Implementing automated assessment tools for internal exams to provide instant feedback to students.

Plagiarism Detection Tools: Using software like **Turnitin or Urkund** (now Ouriginal) to ensure academic integrity and encourage original research among postgraduate and doctoral students.

e-Portfolios: Encouraging students to maintain digital portfolios of their projects and certifications, which are more effective than traditional CVs during placement drives.

4. Collaborative Research and Global Connectivity

ICT tools break the silos of individual institutions:

Video Conferencing: Using **Zoom, MS Teams, or Webex** to host guest lectures from global experts, allowing Indian students to gain international perspectives without travel costs.

Collaborative Documentation: Using **Google Workspace or Microsoft 365** for real-time collaborative research writing and data sharing across different universities.

Cloud-Based Research Tools: Utilizing shared computing power for data-heavy research in fields like Bioinformatics, Physics, and Economics.

III. CONCLUSION

Higher education is a very important subject to any country as it develops the realization of citizenship and most part of the working force serving the nation. Presently, higher education systems are growing rapidly. To ensure the quality along with quantity it is important to involve innovative approaches and technological advancements in the educational system. ICT is being implemented in all the fields including education. But the implementation of ICT in education is comparatively slow due to the issues mentioned in the article. The increasing use of information and communication technologies (ICTs) has brought changes to teaching and learning at all levels of higher education systems leading to quality enhancements. There are endless possibilities with the integration of ICT in the higher education system. The use of ICT in higher education not only improves classroom teaching-learning process but also provides the facility of e-learning. ICT has enhanced distance learning. The teaching community is able to reach remote areas and learners are able to access qualitative learning environment from anywhere and at any time. It is important that teachers or trainers should be made to adopt technology in their teaching styles to provide pedagogical and educational gains to the learners. Successful implementation of ICT to lead change is more about influencing and empowering teachers and supporting them in their engagement with students in learning rather than acquiring computer skills and obtaining software and equipment. Innovative technologies promote quality of education but their implementation is not always easy. We need to take the note of issues, conceptualize challenges and think of possible solutions.

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