

The Development of ICT Projects and their Role in Promoting Higher Education in India

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ABSTRACT

In the present hi-tech world, as the information delivery is moving rapidly into digital media, the Information and Communication Technology (ICT) projects in education plays a vital role. The ICT tools help to share the availability of best teaching practices and best course material in education. The Government of India has undertaken many projects with a mission to make India as a knowledge super power in the world by Education through ICT. These projects leverage the potential of ICT, in teaching and learning process for the benefit of all the learners in Higher Education Institutions. This paper presents insights of the major ICT projects implemented by the Central Ministry of Human Resource Development and their role in promoting quality and equity education in Indian Universities and Colleges.

Keywords : ICT, Internet, Robotics, E-learning

1. INTRODUCTION

India is a country with largest number of higher educational institutions consisting of over 650 universities and above 32,000 colleges. Due to large population, the enrollment of students in the universities is increasing every year; however, this growth in numbers does not reflect much improvement in the quality content delivery of higher education in the country. The education system in India continues to suffer due to inadequate access to technology and inequity. Fortunately, the ICT as a tool in education is available at this juncture and the government wishes to fully utilize it to enhance the quality and equity in Higher Education. ICT stands for Information and communication technology. It refers to technologies that provide access to information through telecommunication [1]. While it is believed that ICT can transform the educational scenario in the country, it should address the needs and perform multiple roles in higher education to benefit all stakeholders. The objectives of the ICT projects for Education shall include (a) the development of knowledge modules having the right content to take care of the aspirations and to address to the personalized needs of the learners; (b) standardization and quality assurance of contents to make them world class; (c) building connectivity and knowledge network among and within institutions of higher learning in the country; (d) availability of knowledge contents, free of cost to Indians; (e) spreading digital literacy for teacher empowerment; (f) experimentation and field trial in the area of performance optimization of low cost access/devices for use of ICT in education; (g) providing support for the creation of virtual technological universities; (h) identification and nurturing of talent; (i) certification of competencies of the human resources acquired either through formal or non-formal means and the evolution of a legal framework for it; and (j) developing and maintaining the database with the profiles of our human resources. [7].

2. BENEFITS OF ICT IN EDUCATION

Information Communication Technologies (ICT) refer to the computer and internet connections used to handle and communicate information for learning purpose. ICT makes curriculum implementation learner-centred with a self-learning environment that enables the student customize his/her own learning experiences [2]. According to a United Nations report (1999) ICT covers Internet service provision, telecommunications equipment and services, information technology equipment and services, media and broadcasting, libraries and documentation centres, commercial information providers, network-based information services, 2 and other related information and communication activities. ICT increases the flexibility of delivery of education so that learners can access knowledge anytime and from anywhere. It can influence the way students are taught and how they learn as now the processes are learner driven and not by teachers. This in turn would better prepare the learners for lifelong learning as well as to improve the quality of learning [3]. ICTs, as technological tools, have increased the degree of significance and educational conception, establishing new models of communication, besides generating spaces for training, information, debate, reflection, among others, as well as breaking up the barriers of traditionalism in the classroom [4] E-learning provides opportunities for the learners to work together without being limited by demography aspect. The learners can build learning community. E-learning opens up opportunity for the students to communicate and learn from others without having face-to-face interaction. It can accommodate from small number to huge number of participants without drastically affects its cost [5-6].

3. NATIONAL MISSION ON EDUCATION THROUGH ICT

Realizing the importance of Information and Communication Technology (ICT), as per the Mission Document, the Ministry of Human Resource Development, has made ICT as the tool in education to enhance the quality in Higher Education. The National Mission on Education through Information and Communication Technology (ICT) has been envisaged as a centrally sponsored scheme to leverage the potential of ICT, in providing high quality personalized and interactive knowledge modules over the internet/intranet for all the learners in Higher Education Institutions on any time and through any mode. The Mission has two major components; content generation and connectivity for access [7]. It plans to focus on appropriate pedagogy for e-learning, providing facility of performing experiments through virtual laboratories, on-line testing and certification, on-line availability of teachers to guide and mentor learners, utilization of available Education Satellite (EduSAT) and Direct to Home (DTH) platforms and training and empowerment of teachers to effectively use the new method of teaching learning. This Mission is an opportunity as well as a challenge for the faculty members of our Universities and Institutions of Excellence to invest their intellectual capital for the knowledge empowerment of all the learners of our country.

4. OVERVIEW OF MAJOR ICT PROJECTS

4.1 The Sakshat Portal

This is a One Stop Education Web Portal launched to facilitate lifelong learning for students, teachers and those in employments or in pursuit of knowledge at free of cost. The portal brings together the best experts in the country in their respective fields and best available knowledge resources on the web in the public domain. The content development task for

‘SAKSHAT’ was looked after by the Content Advisory Committee (CAC) for the respective subject by prominent academicians in the field. The vision is to scale up this pilot project ‘SAKSHAT’ to cater to the learning needs people through a proposed scheme of ‘National Mission in Education through Information and Communication Technology (ICT). The scheme is to provide connectivity to all institutions of higher learning to world of knowledge in the cyber space, to leverage the potential of ICT, in providing high quality knowledge modules with right e-contents, to address to the personalized needs of learners, in order to take care of their aspirations [8].

4.2 National Programme in Technology Enhanced Learning

The National Programme on Technology Enhanced Learning (NPTEL), a project funded by the Ministry of Human Resource Development (MHRD), provides e-learning through online Web and Video courses in Engineering, Sciences, Technology, Management and Humanities. This is a joint initiative by seven IITs and IISc Bangalore. Other selected premier institutions also act as Associate Partner Institutions. NPTEL is a curriculum building exercise and is directed towards providing learning materials in science and engineering by adhering to the syllabi of All India Council for Technical Education ^[2] and the slightly modified curricula of major affiliating Universities. It has developed curriculum based video courses and web-based e-courses targeting students and faculty of institutions offering UG engineering programs. Certification courses are offered by NPTEL in association with industry partners like Aricent, NASSCOM and Google [9].

4.3. e-Yantra

e-Yantra project is an initiative by IIT Bombay to bring the experience of Project Based Learning to engineering students by using a competition to deliver hands-on on-line training. e-Yantra Robotics Competition (eYRC) is a unique annual competition for undergraduate students in science and colleges. Selected teams are given a robotic kit with accessories and video tutorials to help them learn basic concepts in embedded systems and microcontroller programming. Abstracts of real world problems assigned as "themes" are then implemented by the teams using the robotic kits. The winners of this competition will be eligible for summer internship at IITB through e-Yantra Summer Internship Program. e-Yantra Lab Setup Initiative (eLSI) is a college level program under which colleges are encouraged to setup robotics labs. e-Yantra Symposium(eYS) is an annual event at IIT-Bombay -- to bring together colleges which have set up robotics labs through the e-Yantra Lab Setup Initiative (eLSI). The goal is to share projects and brainstorm new ideas for improving pedagogy and the quality of BE projects [10].

4.4 The CO-LEARN Portal

The CO-LEARN portal provides free access to a few selected graduate and postgraduates courses taught at IIT Bombay by distinguished faculty member and scholars. It supports free access to live lecture recordings, lecture slides, references and assignments [11]. The Objectives of this Project is (a) to popularize the work of research scholars; (b) to create a discussion forum among researchers from different disciplines, both within IITB and from other colleges; (c) to inspire college teachers and postgraduate students to undertake research and (d) to reach out to research labs and companies who are potential employers of our research scholars.

4.5 The Amrita Virtual Interactive E-Learning World (A-VIEW)

. A-VIEW is an internet based virtual knowledge sharing platform, developed by Amrita E-Learning Research Labs of Amirta University. It provides an immersive e-learning experience that is almost as good as a real classroom experience [12]. A-VIEW is now deployed at several IITs, NITs and other leading educational institutions across the nation. It addresses one of the most critical issues of India's Higher Education system today: Millions of students wanting to learn who are not fortunate enough to have well-qualified teachers to train them. With A-VIEW one good teacher can teach tens of thousands of students simultaneously at different locations all over India, as though in person.

4.6 The Consortium for Educational Communication (CEC)

The Consortium for Educational Communication popularly known as CEC is one of the Inter University Centre set up by the University Grants Commission of India. It has been established with the goal of addressing the needs of Higher Education through the use of powerful medium of Television along with the appropriate use of emerging Information Communication Technology [13]. Realizing the potential and power of television to act as means of Educational Knowledge dissemination, UGC started the Countrywide Classroom Programmes in the year 1984. For production of such programmes Media Centres were set up at many Universities. Subsequently CEC emerged in 1993 as a nodal agency to coordinate, guide and facilitate such Educational production at the National level.

4.7 The V-Lab Project

The V-Lab project is an initiative of Ministry of Human Resource Development (MHRD) under the National Mission on Education t provide remote-access to Labs in various disciplines of Science and Engineering. These Virtual Labs would cater to students at the undergraduate level, post graduate level as well as to research scholars. This would help them in learning basic and advanced concepts through remote experimentation. This provides a complete Learning Management System around the Virtual Labs where the students can avail the various tools for learning, including additional web-resources, video-lectures, animated demonstrations and self evaluation [14]. The portal supports modeling the physical phenomenon by a set of equations and carrying out simulations to yield the result of the particular experiment. This can, at-the-best, provide an approximate version of the 'real-world' experiment by providing measured data for virtual lab experiments corresponding to the data previously obtained by measurements on an actual system. The main feature of V-lab is that it is remotely triggering an experiment in an actual lab and providing the student the result of the experiment through the computer interface.

4.8 INFLIBNET

Information and Library Network (INFLIBNET) Centre is an autonomous Inter-University Centre of the University Grants Commission (UGC) of India. INFLIBNET is involved in modernizing university libraries in India and connecting them as well as information centres in the country through a nation-wide high speed data network using the state-of-art technologies for the optimum utilization of information. [15]. The Shodhganga@INFLIBNET Centre provides a platform for research students to deposit their Ph.D. theses and make it available to the entire scholarly community in open access. The VIDWAN is a premier database

of profiles of scientists / researchers and other faculty members working at leading academic institutions and other R & D organizations involved in teaching and research in India. The database would be instrumental in selection of panels of experts for various committees, taskforce, established by the Ministries / Govt. establishments for monitoring and evaluation purposes. The INFLIBNET Centre has developed a web-based interface called "Vidya-mitra: Integrated e-Content Portal" for all e-content projects, developed and funded under the National Mission of Education through ICT.

5. CONCLUSION

Applying ICT tools in different dimensions of the Indian education system is taking place at a fast pace. Use of ICT in higher education brings a change in student and teacher learning behavior and the collaboration of all stakeholders in the universities and colleges by sharing the information for mutual benefit. Also it would contribute significantly to enhance the access and quality of education, but at the same time it may generate situations, which warrant attention. The delivery mechanisms and content of education in general and higher education in particular have been highly influenced by technology and are under transition. These changes present challenges before us to design and develop mechanisms to harness the great potential of information and communication technologies for quality and equity education. Hence the ICT integration in higher education is a momentous opportunity for all the teachers and experts in the country to pool their collective wisdom for the benefit of every Indian learner.

REFERENCES

1. K. Ratheeswari, Information Communication Technology in Education, Journal of Applied and Advanced Research, (2018).
2. Fisseha Mikre, The Roles of Information Communication Technologies in Education Review Article with Emphasis to the Computer and Internet , Ethiopian Journal of Education and Sciences, Vol. 6 No.2 (2011).
3. Syed Noor-Ul-Amin, An Effective use of ICT for Education and Learning by Drawing on Worldwide Knowledge, Research, and Experience: ICT as a Change Agent for Education Scholarly Journal of Education Vol. 2(4), pp. 38-45, April (2020)..
4. Ronald M. Hernandez, Impact of ICT on Education: Challenges and Perspectives, Journal of Educational Psychology, Jun. (2017), Vol. 5, N° 1: pp. 325 – 347.
5. Adi Suryani, ICT in Rducation : its benefits, difficulties and organizational development issues , JSH Journal of Social Humanities, Vol 3 No.1, June (2010).
6. Baishakhi Bhattacharjee and Kamal Deb, Role of ICT in 21st Century's Teacher Education, Int. Journal of Education and Information Studies. Vol 6, No 1, (2016).
7. National Mission on Education through ICT – aicte, <https://www.aicte-india.org/>.
8. SAKSHAT | National Mission on Education through ICT, <https://sakshat.ac.in/>.
9. NPTEL, online courses and certification, Learn for free, <https://nptel.ac.in/>.
10. e-Yantra Learning by competition, <https://e-yantra.org/>.
11. Co-Learn Corridors of Learning, <https://co-learn.in/>.
12. A-VIEW - The Versatile E-Learning , <https://aview.in/>.
13. Consortium For Educational Communication, <https://www.cec.nic.in/>.
14. Virtual Labs, <https://vlab.co.in/>.
15. Information and Library Network Centre, <https://inflibnet.ac.in/>.