Distance Learning: Information and Communication Technologies

Dr. Joginder Singh Cheema
HOD, Department of Computer Applications,
Baba Budha College, Bir Sahib, Tarntaran.

Abstract: With the advancement in technology in the field education has introduces variety of new techniques for educators and learners to enhance knowledge. Educational technologies (information and communication technology) are replacing direct teacher-student interaction. Anything that helps distance learners to communicate: learner with instructor, learner with learner and learner with the learning materials may be term as information technology. The different ICTs being used in ODL and their specific applications to the various facets of this mode of delivery are also described. Also included is an examination on how quality of education is ensured in a technology-driven system of teaching and learning, which includes, among others, the employment of the 'quality circle approach' in the development of courses and learning packages, and the provision of appropriate technologies to perform academic processes and achieve institutional goals. Technological advancements especially in the area of ICT allow teachers to employ various strategies that could actively engage student's interest. This paper focuses the role of information and communication technologies (ICT) in open and distance education. This study also explores technology-based media which is very important for distance learners.

Keywords: Open and distance learning; distance education; digital divide; information and communication technologies; developing countries;

I. INTRODUCTION

ICT is a major factor in shaping the new global economy and producing rapid changes in society. Within the past decade, the new ICT tools have fundamentally changed the way people communicate and do business. They have produced significant transformations in industry, agriculture, medicine, business, engineering and other fields. They also have the potential to transform the nature of education where and how learning takes place, and the roles of students and teachers in the learning process.

Embedding ICT in teaching-learning process is a major initiative in all branches of education; ICT has a particularly important role to play in developing provision for bilingual learners. This is concerned with exploring new ways of working with bilingual learners as well as facilitating more established techniques. The increased use of ICT to deliver and enhance aspects of educational provision is now an emerging practice for all learners belonging to rural and geographically remote and mainly monolingual areas thus having advantages in overcoming geographical barriers [1][2].

The role and the use of the Information and Communication Technology (ICT) in Learners Support Services in Open and Distance Learning (ODL) is a proven fact now. The distance education system responded positively and quickly to the revolution in ICT. It is because of three reasons – the need to reduce the cost of imparting education, to introduce need based educational programmes to a large number of people and to reduce time required for sanctioning new programmes by adopting new flexible nature of administration. For example video conferencing facilities developed to enable isolated learners to share learning with others in remote areas can also be used to reduce linguistic isolation by allowing same first language learners to discuss and communicate remotely.

II. ICT AND LEARNER SUPPORT

The role of ICT to speed up the delivery of the support services has now become inevitable for the distant learners. It also considers the shift from mass produced generic resources to tailored, personalised support and communications and sets this in the context of globalisation of the economy and the changing expectations of students as 'consumers.'

Distance and open education schemes that have until recently relied mainly on the mailing of written materials, videos, cassette recordings, and radio or TV broadcasting techniques can be augmented, enhanced or replaced by new on-line tools and technologies which have the power to transform the learning environment. [3][4] Learners Support Services are an important part of Distance Educational system. Since the learners in ODL system are not directly involved in the regular classroom teaching-learning process having direct interaction with the teachers regularly, they are provided with adequate Learners Support Services.

Such support services include the pre-admission counselling, admission process, provision of study materials both in print media and audio visual forms, subject specific academic counselling, audio visual viewing facilities, participation in teleconferencing, ICT facilities for e-learning, library services, laboratory support facilities, academic career guidance, information services related to rules, regulations, procedures, schedules etc.

III. BENEFITS OF ICT IN DISTANCE LEARNING

Technological developments are coming together which offer the following benefits:

- Through the Internet and worldwide web, new and enlarged sources of information and knowledge that offer teachers and students opportunities for self-development as well as benefits from incorporation into classroom environments.
- Through e-mail and other Internet related feedback mechanisms, greater opportunity to reduce the isolation and time delay associated with distance education.
- Through the extraordinary pace of software development, enriched teaching and learning with enhanced graphics, interaction, animation and visualisation.
- Through lowering telecommunications bandwidth costs and emergence of enhanced cable, wireless and satellite systems, greater opportunities for basic access, video conferencing, on-line interactive learning, and live interaction with the central place of a distance education programme.
- Through community access schemes, more potential to make the benefits of distance education eventually available to lower income people and rural communities.

[5][6]Sound pedagogical principles would increasingly dictate the need for a more interactive learning environment which was earlier difficult to achieve and also adds considerably to the remotest areas. But it was noted that its deployment requires expensive satellite resources as well as an expensive face-to-face lecture and broadcast system running in parallel.

Very Small Aperture Terminal (VSAT) satellite systems are increasingly seen as a powerful distribution mechanism for Internet based resources, with ready access to interactive learning tools and e-mail, especially when linked or packaged with key educational web-site sources, servers and services. VSATs can overcome many of the bandwidth/delivery speed, limitations of terrestrial systems, particularly in developing countries, and can be especially economic when deployed in an asymmetric multi-casting mode in which high-speed 'downlink' capability is combined with slower speed 'uplinking.'

IV. FIVE FACTORS: USE OF ICT IN DISTANCE EDUCATION

[7] These features and the emerges the need of specially designed Distance Education network management and learner software packages of ICTs in distance education especially in the developing world.

The use of ICT in distance education actually depends on at least five factors. These are:

- Geographical size and situation: Large countries with dispersed people and communities have an additional drive or motivation to use communications to deliver educational services cost-effectively.
- Policy on telecommunications: The Internet, IT and Education, Privatisation and Liberalisation of telecommunications and the Internet are improving quality, lowering costs and accelerating innovation around the world. Education policy is often the key to raising awareness and providing leadership in educational use of ICTs.
- Population and market size: Small markets attract fewer investors and less competition, and offer fewer economies of scale which would lead to price reduction, while regional schemes can overcome that, aggregate market size and achieve scale economies.
- Per capita means: To address start-up INVESTMENT challenges and the market affordability to attract commercial players to ease the way to change and growth.
- Perceived educational or developmental needs: These can relate to educational delivery challenges due to geographic or cultural isolation, or appreciation for the more systematic challenges – such as adapting to the demands of the information economy which can only be seriously addressed with ICTs.

V. CHALLENGING ISSUES OF ICT INFRASTRUCTURE SETUP & USAGE IN ODL

Information and communication technologies playing a prime role in supporting various services in open distance learning in large scale and at same time there are many issues and challenges in setup and usage of ICT infrastructure.[8][9] The following are various issues and challenges: Application/service compatibility with respect to the computer hardware and software Technology is changing very frequently, but it is difficult every time to develop application software for various services using such technology. New technology has always flexible features that are needed in ODL system to meet the demands of the learners in large scale, but it is a challenging task to choose ideal hardware and software that have compatibility with existing application software. Application compatibility with respect to hardware and software can be achieved by placing platform independent infrastructure (the hardware, software and application). Scalability issues Open distance learning is a more flexible education system than any other conventional education system. Due to this, the student enrollment is very high and at same time expectations from learners also high. As learners are more in scale and remote to the institution, most of the activities being performed remotely through the online services that are provided by the institution. Since, the learners and their usage is increasing progressively, time to time ,it is a challenging issue to maintain always scalable resources in terms of memory space, handle number of users and their transactions. This issue can be addressed by anticipating the scalable load at network level, system level, application/service level and data storage level at least for a period of 5 to 7 years and place an adequate computing, storage and network infrastructure. Ensure data compatibility: As database technology is changing time to time, ensuring data compatibility with changing database technology is a challenging task. If the old data is not compatible with new database technology, it is very difficult to use and access data through various services/applications. Data compatibility problem can be achieved by encouraging data migration process in various stages time to time so that the data is always compatible to new database technology to use and access it all the times. Dynamic allocation of Internet bandwidth Dynamic allocation of internet bandwidth to a specific service is a challenging issue. The accessibility of a service shall be ensured only with the availability of internet bandwidth as it is one of the prime parameters. As allocation of internet bandwidth to a specific service is directly proportional to the amount of usage of that service, there is a need of dynamically allocation of bandwidth time to time to that service. The problem can be achieved by introducing bandwidth management and load balancing system to ensure availability of a service. As online services are essential in ODL, it is ideal to have more than one ISP so that the availability of a service can be ensured always. Policy updates Due to flexibility in open distance learning system, there will be frequent changes in admission criteria, evaluation criteria and even in learning procedure and policies to be adopted accordingly. As there is a frequent change in policies, it is a difficult task to update the policies every time, but if policy updation has not been done in time, it leads to many other operational problems. This issue can be addressed by introducing dynamic policy updation and enforcement approach in open distance learning system. Dedicated network connectivity among various operational nodes In open distance learning system, learners are remote to the institution in many ways and getting services through one of its operational nodes. It is a difficult to have proper network connectivity among various operational nodes to provide/access services due to non availability of technical manpower. This problem can be achieved by establishing dedicated network connectivity among various operational nodes in form of intranet by using MPLS/VPN technology. [10] Support services: In open distance learning system, learners are remote to the institution many ways and require various online support services to perform their activities. Since ODL is a flexible system, the operational policies need to be changed frequently and is difficult to provide updated support services in time due to laps at various levels in the system. This problem can be addressed by involving all related personnel at the time of initiation of an activity so that its impact, if any on existing services can be discussed and find timeframe to provide support services in time. Manpower inline with change in technology: As technology is frequently changing time to time, it is a difficult task to have updated manpower inline with change in technology. It is even very difficult to have such manpower in government organizations. This problem can be achieved by introducing brainstorming and counseling sessions time to time and also to impart training/workshops on change in technology time to time.

VI. CONCLUSION

Education is the elementary right of human being for the development of a person both professionally and personally. With the emergence of technology especially in the field of open and distance education have open a new horizon for distance learners. Application of technology in

education is not the ultimate goal; instead, we should use it to pursue quality. Information and communication technologies (ICT) are potentially powerful enabling tools for educational change and reform.

Rapid advances in information and communication technology pose new opportunities as well as challenges for every society. In the education sector, ICT has enormous potential to help countries address issues of access to learning, quality of the teaching-learning process and management of education systems. In order to ensure the quality of education, the distance education institutions must be careful about the use of proper technologies and media. We have to think the uses of media and technology in regard to appropriateness and acceptability in the society as well as on the ability of the institution offering the program. The socio-economic and cultural background of a person influences their ability to learn from different media technology. It is true that ICT is playing a vital role in open distance learning but at same time there are many issues and challenges that are to be addressed for smooth functioning of various online services that are to be implemented for its learners and other public. In this paper, the required ICT infrastructure and various issues and challenges in usage and setting up of ICT infrastructure in open distance learning are addressed. The institution that is providing education in ODL mode should look at all the addressed issues and challenges and take necessary precautions with a proper action plan along with timeframe.

REFERENCES

[1] A. Murali M Rao, 2009, ' Web-enabled User Support Services System in Distance Learning', Proceedings of International Conference on Interaction Sciences: Information Technology, Culture and Human(ICIS 2009), The ACM International Conference Proceeding, Vol I, ISBN 978-1-60558-710-3,Seoul, Korea, pp 86-90.

[2] A. Murali M Rao, 2010, 'Digital Library Security: A Layered Approach', Proceedings of International Conference on Digital Libraries(ICDL 2010), Volume 2, New Delhi, pp 1167-1171.

[3] Bernadette Robinson, 2008, 'Using distance education and ICT to improve access, equity and the quality in rural teachers' professional development in western China', International Review of Research in Open and Distance Learning, Volume 9, Number 1, Chaina.

[4] Sangay Jamtsho, 2005, 'Challenges of ICT use for distance learning support in Bhutan, ICDE International conference', New Delhi.

[5] Collis, B (1996). *Tele-learning in a Digital World*. Thompson Computer Press.

[6] Farren, M. (1998).*Using the Internet for Professional Development*, Conference Proceedings, Third [7] European Conference on Integrating Information And Communication Technology in the Curriculum, August 17th-21st, 1998, page 99-104.

[7] Kaye, A. and Mason, R. (1989*). Mindweave: communication, computers and distance education.* Oxford, Pergamon Press.

[8] Taylor, J. C. (1995). Distance Education Technologies: The fourth generation, Australian Journal Educational technology, 11(2), 1-7

[9] Taylor, J. C. (1992). Distance education and technology in Australia: A conceptual framework' International Council of Distance Education Bulletin, 28: 22-30

[10] Victoria, L. Tino. (2002). ICT in Education, UNDP-ADIP, Kuala- Lumpur