

The Roles of Information and Communication Technology (ICT) Development in Open and Distance Education: Achievements, Prospects and Challenges

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I. The Promises of ICT in the Education Sector

When the needs are huge, fully online learning can be crucial and possibly the only realistic means to increase and rapidly widen access to tertiary education. Some developing countries have huge cohorts of young people and shortages in their academic workforce that result in unmet demands for education. Given that training new teachers would take too much time, notwithstanding resources, e-learning therefore might represent for many potential students the only chance to study, so it is not merely an alternative to full face-to-face learning (World Bank, 2003).

E-learning may also be viewed as a promising way for improving the quality of tertiary education and the effectiveness of open distance learning. These promises can be derived from different characteristics of ICTs, including: the increased flexibility of the learning experience it can give to students; the enhanced access to information resources for more students; the potential to drive innovative and effective ways of learning and/or teaching, including learning tools; easier use of multimedia or simulation tools; and the possibility to diffuse these innovations at low marginal cost among teachers and learners (Bate, 2000).

Distance E-learning has not only the virtue to be inclusive for students that cannot participate in tertiary education because of time, space, or capacity constraints, as was revealed above. It can also offer to students more personalized ways of learning than collective face-to-face learning. It can be helpful even in small groups. Although learning is often personalized to some extent in higher education through the modularity of paths, ICTs allow institutions to give students a wider variety of learning paths from which to choose. This is not usually the case in non-ICT supplemented institutions because of the administrative burden this represents in large institutions. This means that students can experiment with learning paths that best suit them. Moreover, e-learning can potentially allow students to take courses from several institutions, i.e. some campus-based and others fully online. This potential flexibility of individual curricula may be seen as an improvement of the overall student experience, regardless of pedagogical changes. In brief, e-learning could render education more learner-centered compared to the traditional model (Smith and Thille, 2004).

Finally, as far as prospects and promises are concerned e-learning may be seen as a promising way to reduce the cost of tertiary education, which is critical for expanding and widening its access worldwide. It might thus represent new opportunities for students having difficulties with traditional education formats. Although initial ICT investments are expensive, they can then generally be used at near-zero marginal cost. Where does this cost-efficiency come from? It comes

from the replacement of expensive brick and mortar campuses by smaller virtual campus centers; the digitization of library materials that save the cost of keeping huge paper collections; the improvement of efficiency of institutional management; and the automation of some of the traditional on-campus activities, including some teaching (Taylor and Hogenbirk,2001;Librero, 2006).

II. Effectiveness of ICT in Open and Distance Learning

The role and the use of the 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 programs to a large number of people and to reduce time required for sanctioning new programs by adopting new flexible nature of administration (Bates, 1995) .

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. 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.

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 counseling, admission process, provision of study materials both in print media and audio visual forms, subject specific academic counseling, 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.

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, personalized support and communications and sets this in the context of globalization 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.

Technological developments are coming together which offer the following benefits (Baruah and Handique 2009):

- 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 visualization.
- 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 program.
- Through community access schemes, more potential to make the benefits of distance education eventually available to lower income people and rural communities.

The use of ICT in distance education actually depends on at least five factors. These are (Baruah and Handique 2009):

- 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, Privatization and Liberalization 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.

The use of technologies in distance education has become crucial in the modern world as competition increases, while markets open to the world, as it becomes a global village. The quest for better qualifications and good employment positions drive people to equip themselves suitably through any possible means. Any institution that uses accessible technologies to reach its clients, while providing affordable education courses at the comfort of its learners, has a good chance to prosper and take a fair share of the market.

III. Development Open and Distance learning in Ethiopia

In a developing country like the Ethiopia where the ‘digital divide’ is more the rule than the exception, delivering instruction through the distance mode presents a significant challenge to educators. In a nation where the concern of most people is meeting their basic need for food, clothing, and shelter, access to ICTs, especially the most modern ones, is very low on their list of priorities – and oftentimes, not considered a priority at all.

Nonetheless, ICT has had a major impact on ODL in the Ethiopia. More than the availability of these technologies, issues such as geographical location, lack of knowledge and skills to use ICT, and financial constraints, are major considerations in deciding what ICT to use and in what combination. Indeed, the use of a particular ICT must not only address certain pedagogical concerns, it must aim to bridge the digital divide and democratize access to quality education.

Experience has shown that when a decision has been made to use a technology in ODL, this decision influences not only the teaching and learning environment; it leads to the development of new cultures, concepts, and understanding. Put simply, the introduction of ICT can alter and raise expectation among users and institutions alike.

ODL and e-Learning in the Ethiopia had undergone some evolutionary changes in both form and content. The past few decades has witnessed some phases or stages of ODL development, based on the dominant technology in use at the time. Just like any other evolutionary process, it is very hard to definitively identify the end or beginning points of specific stages, as use of older with newer DE

technologies tend to overlap and blur the boundaries. Nonetheless, the main concern has always been the pedagogy used, and not the technology itself per say.

The development of ODL in Ethiopia has undergone three or four stages/generations. The 1st stage involves non-formal courses and tips on farming and community development delivered via radio. Lately, TV has been used to offer some educational programs. The 2nd generation saw few higher education institutions, especially private ones, started offering their diploma & degree programs via distance methods, relied mostly on print-based instructional materials and supplemented with occasional face-to-face tutorials. The 3rd generation with growing need for flexible learning, anytime, anywhere, increased availability and access to new ICT and growing demand for lifelong learning print-based formats, supplemented with lessons components typically in convenient audio and /or video formats. The 4th generation can be inappropriately described using terms e- learning (electronic learning) and m-learning (mobile learning) mainly by foreign universities like UNSIA, IGNOU, UK Open University, etc.

IV. Cases Studies

For the purpose of finding out the effectiveness of the use and role of ICT in distance mode, IGNOU, UK Open University and UNSIA have been chosen as case studies. This is mainly because they use a wide variety of ICT materials to reach out to the distance learners /students.

IGNOU

The Indira Gandhi National Open University (IGNOU), established in 1985, has continuously striven to build an inclusive knowledge society through inclusive education. It has tried to increase the Gross Enrollment Ratio (GER) by offering high-quality teaching through the ODL mode. Today, it serves the educational aspirations of over 3 million students in India and other countries. The mandate of the University is to:

- Provide access to higher education to all segments of the society;
- Offer high-quality, innovative and need-based programs at different levels, to all those who require them;
- Reach out to the disadvantaged by offering programs in all parts of the country at affordable costs; and
- Promote, coordinate and regulate the standards of education offered through open and distance learning in the country.

To achieve the twin objectives of widening access for all sections of society and providing continual professional development and training to all sectors of the economy, the University uses a variety of media and latest technology in imparting education. This is reflected in the formulated vision of IGNOU, keeping its objectives in focus, which reads:

The Indira Gandhi National Open University, the National Resource Centre for Open and Distance Learning, with international recognition and presence, shall provide seamless access to sustainable and learner-centric quality education, skill up gradation and training to all by using innovative technologies and methodologies and ensuring convergence of existing systems for large-scale human resource development, required for promoting integrated national development and global understanding.

The University is committed to quality in teaching, research, training and extension activities, and acts as a national resource centre for expertise and infrastructure in the ODL system. The University has established the Centre for Extension Education, National Centre for Disability Studies and National Centre for Innovation in Distance Education, to focus on specific learner groups and enrich the distance learning system.

With the launch of EduSat (a satellite dedicated only to education) on 20th September, 2004, and the establishment of the Inter-University Consortium, the University has ushered in a new era of technology-enabled education in the country. All the regional centers and high enrollment study centers have been provided with active two-way video-conferencing network connectivity, which has made it possible to transact interactive digital content.

Emphasis is now being laid on developing interactive multimedia and online learning, and adding value to the traditional distance education delivery mode with modern technology-enabled education within the framework of blended learning.

Over the years, IGNOU has lived up to the country's expectations of providing education to the marginalized sections of society. Free of cost education is being provided to all jail inmates across the country.

IGNOU provides multi-channel, multiple media teaching-learning packages for instruction and self-learning. The different components used for teaching/learning include self-instructional print and audio-video materials, radio and television broadcasts, face-to-face counseling/tutoring, laboratory and hands-on experience, teleconferencing, video conferencing, interactive radio counseling, interactive multimedia CD-ROM and Internet –based learning, and the use of mobile phones for instant messaging.

While the traditional distance education delivery through print and study centre support is being strengthened, the University is gearing towards the development of interactive multimedia content and learner support through video-conferencing and web –based platforms, by utilizing both the EduSat and the Internet. The design of the instructional system, as well as teacher and learner capacity building, are facilitated by the different Schools, Divisions and Centers of the University.

The UK Open University

The university was given its Royal Charter in 1969. Since then, it has become the UK's largest university, and the only UK University dedicated to distance learning. More than two million people have studied with the OU since its opening. Today more than 30% of all part-time undergraduate students in the UK study with the OU.

OU students study in their own homes and workplaces; taking courses whose materials and methods are specifically designed for this type of distance learning. All have tutors, and most also have the opportunity to meet tutors and other students at local tutorials. The university's methods allow for study anywhere in the UK and in many other parts of the world.

The Open University was established to be 'open', with no entry requirements. Nearly all of its courses continue to have no entry requirements. Some courses aimed at postgraduates or people who are working in specific jobs do have entry requirements.

The Open University offers more flexibility than most other universities. Although the start and end dates of most courses are fixed (and there are recommended study timetables and fixed days for tutorials), it is for the student to decide when and where they study day-to-day. Some study in the evenings; others work shifts that allow them to work during the day, for example. Flexibility also extends to allowing students to take breaks in study between courses on most programs – to allow them to stop studying after the end of a particular course if they wish and resume at a later date. While the university offers a comprehensive range of named degrees, it also offers Open degrees, which allow students to combine courses from a range of different academic disciplines.

Of the 24 subjects assessed by the Quality Assurance Agency, 17 were placed in the top 'Excellent' category. The Open University has been highly ranked for overall satisfaction in all of the National Student Surveys to date. The OU is one of only two universities in England to have been awarded the leadership of four Centers for Excellence in Teaching and Learning by the Higher Education Funding Council for England.

The OU supports a vibrant research and enterprise portfolio which focuses upon key issues affecting the social, political and physical well-being of individuals, communities, cultures and nations.

The Open University has always been a world leader in the use of new technologies to improve the quality of education for students and to broaden their access to it. Students on two-thirds of all courses undertake e-learning activities to achieve defined learning outcomes. All courses include optional online activities. The university's 'open' mission allows for those people whose previous qualifications would be unlikely to allow them access to university education elsewhere to enter higher education.

UNISA

The University of South Africa, also known as UNISA, is Africa's largest university & top open distance-learning institution. Offers internationally accredited on-line courses to over 400,000 students, including African and international students in 130 countries worldwide, making it one of the world's mega universities. The vision of the institute for open and distance learning is to be a center of innovation and excellence in ODL research.

UNISA attracts a third of all higher education students in South Africa. ODL entails a student-centered approach, giving students the flexibility and choice over what, when, where and how they learn, and provides them with a large student support. UNISA's main campus is found in Pretoria where students are also able to attend the university and lectures and not take part in the ODL program is required.

As a comprehensive university, UNSIA offers both vocational and academic programs, many of which have received international accreditation, as well as an extensive geographical footprint, giving their students recognition and employability in many countries the world over.

V. Lessons Learned

First, those seeking to deploy DE must ensure that any technology used is both pedagogically sound and socially-driven. In other words, it is not wise to use technology simply for technology sake, it must be 'relevant.'

'Relevance' in this case has two dimensions: the first is process and the second is substance. Kling (2001) asserts that design and implementation processes must be relevant to the actual social dynamics of a given site of social practice, and that the substance of design and implementation – specifically the actual designs and the actual systems – must be relevant to the lives of the people in which they affect. Kling also said: Technical work, more superficially, should draw attention to functionalities that people value and more fundamentally, should articulate those analytical categories that have been found useful in describing social reality.

The cost will always be a consideration, however. A fact that has been implied by Bates (2000) who advised that institutions must comprehend the costs of using new technologies. These costs not only must cover the purchase of the technology (e.g., hardware and software) it must cover the cost of training staff so they can acquire the needed skills and knowledge to use the new technologies effectively, or if that is not feasible, securing funds to hire additional staff that possess the needed skills and knowledge.

Access and cost of access must be attainable and affordable for students. While universities can always find ways to make DE technologies available to its staff and personnel, students must also be considered in the costing equation of ‘access’. The cost using ICT, such as the cost of Internet access, cost of sending SMS, or cost of the mobile telephone itself, must be considered when selecting technologies to support DE. Another consideration is that those using this technology should ideally have the skills and knowledge necessary to use the technology effectively (Garcia,2002).

Partnerships and collaboration are strategies that can work to reduce costs associated with DE. Resources tend to be limited and few institutions of higher education have everything they need to implement quality DE. Moreover, as technologies converge, organizations must respond with common goals and objectives. In this context, collaborations can reduce costs associated with designing and implementing commonly used DE platforms and courses (i.e., sharing of reusable learning objects housed in a common repository). Moreover, collaborations often serve as an enriching learning experience for all involved (Librero, 2006).

Implementation of new teaching and learning strategies also requires attendant changes in organizational structures, such as new units and/ or integration of existing units dedicated to the production of DE learning materials. Such changes in organizational structure, however, must be supported by revised policies and procedures that takes into account all units, both old and new, involved.

Research and evaluation is important. As with any new initiative, the research component of DE projects must inform the selection and subsequent use of any new technology. Projects, therefore, must set goals, means to meet those goals, which must be monitored to ensure their effectiveness and efficiency in meeting those goals (Domingo, 2006).

Introducing innovations always have cost implications. Universities have limited resources upon which to research, design, implement, and support DE. Moreover, any innovation – including DE – has a corresponding cost on some other part of the organization. Often there is simply not enough money to go around. As such, organizations must beware of reinventing the wheel (i.e., embarking on costly, custom designed systems) and instead seek to creatively use technologies that are already readily available.

VI. References

Allen, I.E. and Seaman, J. (2003). *Sizing the opportunity: The quality and extent of online education in the United States, 2002 and 2003*, Newport, MA: The Sloan Consortium.

Azinian, H. (2001). Dissemination of information and communications technology and change in school culture. In A. Loveless & V. Ellis (Eds.) *ICT, Pedagogy, and the Curriculum* (pp. 35-41). London: Routledge Falmer.

- Bates, A. W. (1995). *Technology, e-learning and distance education*. New York: Routledge.
- Bates, A. W. (2000). *Managing Technological Change: Strategies for college and university leaders*. San Francisco: Jossey-Bass.
- Cunningham, S., Ryan, Y., Stedman, L., Tapsall, S., Bagdon, S., Flew, T., Coaldrake, P. (2000). *The business of borderless education*. Canberra, Australia: Australian Department of Education, Training and Youth Affairs.
- Dickson Ogbonnaya Igwe *The Roles Of Ict Development In Open And Distance Education: Acheivements, Prospects And Challenges*. Retrieved August, 2016 from:
<https://journal.lib.uoguelph.ca/index.php/ajote/article/view/1827/2591>
- Domingo, Z. (2006). *Text2teach: An ICT-based strategy to help improve quality education in the Philippines*. Paper presented in the *National Conference of the Philippine e-Learning Society*. 28-29 November 2006. Diliman, Quezon City, Philippines.
- Garcia, P. (2002). Tutoring R&D Management: A case in e-learning. Paper presented in the *National Conference of the Philippine e-Learning Society*. 1-2 August 2002. Manila.
- Garrett, R., (2002). *Online learning in commonwealth universities: Selected data from the 2002 observatory survey, part 1*, Observatory for Borderless Higher Education
http://www.obhe.ac.uk/documents/view_details?id=577
- Indira Gandhi National Open University- Wikipedia. Retrieved August, 2016 from
https://en.wikipedia.org/wiki/Indira_Gandhi_National_Open_Universit
- Kling, R. (2001). *What is social informatics?* Center for Social Informatics, Indiana University website. Retrieved March 14, 2007 from: <http://rkcsi.indiana.edu/>
- Librero, F. (2006). *Trends in e-learning of interest to educators*. Paper presented in the National Conference of the Philippine e-Learning Society. 28-29 November 2006. Diliman, Quezon City, Philippines.
- Loveless, A., & Ellis, V. (2001). Something old, something new... Is pedagogy affected by ICT? In A. Loveless and V. Ellis (Eds.) *ICT, Pedagogy, and the Curriculum* (pp. 63-83). London: Routledge Falmer.
- Metropolitan Times (31 December 2003). *E-Learning in the Philippines*.
- OECD (2003). *New challenges for educational research*. Paris: OECD.
- OECD. (2004a). *Innovation in the knowledge economy: Implications for education and learning*. Paris: OECD.
- OECD. (2004b). *Internationalization and trade in higher education: Opportunities and challenges*. Paris: OECD.
- OECD. (2005). *E-learning case studies in post-secondary education*. Paris: OECD.
- Profile of IGNOU, Retrieved August 2016 from: <http://www.ignou.ac.in/ignou/aboutignou/profile/2>
- Smith, J. M. and Thille, C. (2004). *The Open Learning initiative: Cognitively informed e-learning*. London: The Observatory on Borderless Higher Education.
- Taylor, H., and Hogenbirk, P. (2001). *Information and Communication Technologies in Education: The School of the Future*. Amsterdam: Kluwer.
- The Communication Initiatives (n.d.). *World Bank Report: Information and Communications for Development 2006, Global Trends and Policies*. Retrieved March 12, 2007 from:
<http://www.comminit.com/trends/ctrends2006/trends-290.html>
- The Communication Initiatives (n.d.) *The Communication Initiative website*. Retrieved March 14, 2007 from: <http://www.comminit.com/trends/ctrends2006/trends-290.html>

The Open University, Undergraduate. Retrieved August, 2016 from:
<http://www.topuniversities.com/universities/open-university/undergrad>.

Trisha Dowerah Baruah and Krishna Kanta Handique . (2009). *Effectiveness of ICT in Open and Distance Learning: A Case Study*. Retrieved August, 2016

from:<http://digitallearning.eletsonline.com/2009/12/effectiveness-of-ict-in-open-and-distance-learning-a-case-study-2/>

University of South Africa. Retrieved August 18 from: https://en.wikipedia.org/wiki/University_of_South_Africa

Westbrook, J. (2001). The Esloo design for the digital elementary and secondary education. In A. Loveless and V. Ellis (Eds.) *ICT, Pedagogy, and the Curriculum* (55-70.). London: Routledge Falmer.

World Bank. (2003). *constructing knowledge societies: New challenges for tertiary education*. Washington, D.C.: The World Bank.

Zemsky, R. and Massy, W.F. (2004). *Thwarted innovation: What happened to e-learning and why*. Philadelphia, PA: The Learning Alliance.