

ICT and Higher Education: Case Studies from India, Pakistan and Bangladesh

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Abstract: Education is an essential tool in one's life to enhance his employability, productivity and efficiency and thus improve his quality and standard of living. And in this context, one cannot deny the crucial role of Higher Education in fructifying the above-mentioned role. The easy availability of the all possible opportunities of Higher Education does help in creating potential scope of higher economic growth and development through the learners. In this regard, the vital part played by ICT (Information and Communications Technology) in imparting the education of higher level is well appreciable. Knowledge and information can be developed, processed and made available anywhere and to anyone only through the help of ICT. With ICT in play, the quality and standard of higher education has improved a lot, along with its increasing wider coverage. This paper focuses on illuminating the positive role of ICT in imparting higher education in India, Bangladesh and Pakistan and also discusses the common features and differences in the methodology of using ICT in the domain of higher level of education in these countries. The way of incorporating the newest technology in the field of education ease out the complications of gaining knowledge and the same has been observed in these three territorial zones and one can surely agree with the idea that India and its neighboring countries have benefited a lot with the use of ICT in terms of the quality, significance and the outcomes in the context of higher education.

Keywords: Communication, Technology, Higher Education, Knowledge.

Introduction

“The emancipatory and transformative potentials of the Information and Communication Technology (ICT) in Higher Education in India has helped increase the country's requirement of higher education through part time and distance learning schemes. It can be used as a tool to overcome the issues of cost, a smaller number of teachers and poor quality of education as well as overcome time and distance barriers”. (McGorry, 2002). Over time and again,

Education is treated as an essential tool to enhance the quality of one's life. And in this context, all the levels of education matter, starting from elementary education to higher education. The higher level of education plays a vital role in a learner's professional life as it helps the learner to develop various skills like ethical judgement, critical thinking, analytical reasoning, problem solving etc. which are necessary for leading a rational professional and personal life along with the elementary or basic level of core knowledge and learning and there is no denial to the fact that, in this context, ICT has a crucial relevance. Effective use of technology in information spreading or communicating ideas can make learning process more dynamic and creative, thus exciting for the learners. It helps them to get to know new ideas without much efforts as compared to the conventional route of learning. With the usage of ICT in education sector, there is exposure to different forms of learning and also to the same set of information with a different perspective which can make learning more interesting and useful for the society. It is also expected to improve performance of the learners in terms of their learning outcomes because of better quality of education. It is to be observed that with the existence of ICT and its varied tools, the process of learning has improved and the innovations of new ideas, methods and discoveries have been possible in a greater extent.

Literature Review

The benefit of the use of ICT in education sector is not new to be recognized. It has been known to mankind for a long period of time that with new improved technology, education can become more creative, exciting and also interesting for the learners and at the same time, it can be more useful and more effective for the betterment of the country with more application of knowledge and its challenging uses in varied fields. There have been many studies which shows the positive impact of using ICT in education learning. Key skills required for teaching and learning are all provided by software applications such as interactive multimedia, video, CD-ROM dictionaries, digital voice recording and others, as it can be derived from Becta survey (2004). Furthermore, other researches also reported positive results for ICT in Pupils' achievement. (Blow, 2001, TOP, 2001). ICT can help students become more confident and competent in their learning (Passey et al, 2004; TOP, 2001). E-mail, which is regularly used to pursue collaborative projects with schools, can support learning (Usher, 2001). Passey et al. (2004) state that " ICT also enables a multi-sensory approach to be exploited, potentially engaging pupils who would otherwise not explore their

full potential". According to Zhao, and Cziko (2001), there are three conditions necessary for teachers to introduce ICT into their classrooms; teachers should believe the effectiveness of technology, teachers must believe that technology will not cause interference, and finally the teacher must believe that they have the control over these technologies. Students acceptance in the use of new technologies in both formal and informal learning are also increase rapidly (Godwin-Jones, 2005). The use of web quests, simulations, educational games and virtual field trips online also increased in stages (Pururshotma, 2005). Students consider the internet as a virtual textbook, reference library, virtual tutor, learn to study shortcuts, and virtual study groups (McNeoly, 2005). Hypermedia applications are well integrated in the learning environment to enhance student autonomy and thinking (Cheung & Lim, 2000). Communication tools of ICT allows easy communication between students and teachers or between students outside the physical barriers of classroom (Chen, D., Hsu, JJE, and Hung, D. 2000). Interactive electronic whiteboard are such tolls which provide impulsive information sharing, constructing knowledge and stimulate personal growth of students. (Mona, 2004). These studies have empathized on the very importance of ICT and its varied tools in the learning field and the positive and beneficial impact that its use can have not only on the students but also on the parties imparting education that is teachers and thus on the entire education system. These impactful features of ICT make it highly usable and profitable means of providing education given the technological scenario in the current time period.

Role of ICT in Higher Education

Various tools and forms of ICT like internet, web browsers, video conferencing, radio, television, cell phones etc. enhance the learning outcomes because of the better quality of education imparted to students. These tools of ICT help the students' ability to use the conceptual aspects of the discipline in authentic practice, also help in creating more interactive, collaborative, and satisfying environment of learning. Different tools of ICT help in elaborating the way of learning. The use of ICT helps in increasing the motivation of pupils and their confidence too. There is no doubt that learning possibilities expand via collaboration, interaction and communication. There is also an important advantage in the form of potential differentiation of the method of learning according to the individual pupil's needs which allows every potential learner to come into the brackets of learning. Constructive tools of ICT like Excel,

Word, PowerPoint presentation help in expanding the creativity among students because of the exposure to designing statistical data, presenting views in compact format, etc. The speed and automatic feature of ICT overcomes all the physical challenges of teaching and help the teachers to demonstrate the same concept in a more effective way. ICT has the benefit of wide coverage and high capacity without any huge cost of transporting the information or knowledge, that too within short span of time and over the wide distances. There is also huge possibility of the concept of continuous learning because of ICT and catering to the needs of different audiences without any extra or high cost and effort. Teachers can address any set of students irrespective of geographical barriers, social or physical differences which can make their process of imparting knowledge more useful. Students would not be withholding themselves from learning because of any irrelevant reasons and this can contribute a lot in increasing the number of literates in the country. Research has shown that appropriate use of ICTs to catalyze a paradigm shift in both content and pedagogy is the heart of the education reform in the 21st century. It has been observed that the conventional form and set of learning doesn't support the application of theoretical knowledge for the use of the society in an appropriate way and also couldn't contribute much to the lives of the learners which can be addressed with the use of ICT in different formats. Leveraging ICT in a suitable manner enables new methods of teaching and learning, especially for students as it can help them in exploring exciting ways of problem solving in the context of education.

Case Study 1: ICT in India

In India, Higher education has always been a focus of policymakers and many initiatives have taken place to promote higher level of education among the potential learners. The main objective of introducing ICT in the realm of higher education was to allow the learners to learn and equip themselves with the latest knowledge and indulge themselves in new researches and contribute to the growth and development of India. The initiative called Gyan Darshan (GD) was launched in 2000 to broadcast educational programs not only to school kids but also for university students. Teachers/Resource persons and IGNOU Regional Center functionaries interact for academic and administrative matters with students in this channel. Induction Programmes for new students and convocations for graduating students are also conducted live through Teleconferencing every year. Gyan Darshan is also available on webcast, thus

extending the reach of IGNOU programmes to audience world over. GD is a 24-hour educational channel which offers the best of educational programmes covering a variety of subjects and catering to a wide range of viewers. Another initiative by IGNOU is the introduction of Gyan Vani (GV) FM Radio in 2001 as a network of educational FM Radio Channels operating from various cities in the country. It serves as an ideal medium for niche audience addressing the local educational, developmental and socio-cultural requirements of the people. The main aspect of this idea was to keep the medium of learning local using the indigenous language of the region. The overall content pertains to Primary and Secondary Education, Adult Education, Technical and Vocational Education, Higher Education, Distance Education and Extension Education etc. The pilot project SAKSHAT: A One Stop Education Portal was launched on October 30, 2006 to facilitate lifelong learning for students, teachers and those in employment or in pursuit of knowledge free of cost to them. The National Mission on Education through Information and Communication Technology (ICT) The Mission has two major components viz., (a) content generation and (b) connectivity along with the provision of access devices for institutions and learners. It seeks to bridge the digital divide, i.e., the gap in the skills to use computing devices for the purpose of teaching and learning among urban and rural teachers/learners in Higher Education domain and empower those, who have hitherto remained untouched by the digital revolution and have not been able to join the mainstream of the knowledge economy. (aicte-india.org). IIT Kanpur has developed “Brihaspati” an open source e-learning platform. It is the Learning Management System to build e-learning courses offered by the institute and deliver them across wide area networks. Eklavya is an initiative of National Institute of Open Schooling (NIOS) towards massive open online courses (MOOCs). In this, courses are designed to be offered at Senior Secondary level and also the Vocational courses are provided through distance learning medium. In 1986 Jadavpur University with its limited resources took a project entitled Computer Aided Instruction (CAI) Project for using computer as teaching-aid to supplement the conventional class-room teaching. School of Education Technology (SET), was established in 1988 by Jadavpur University (JU) to appreciate the importance of the Open-Learning System and carry out Research & Development work in different aspects of Teaching-Learning Process for improvement of Quality of Education. The main thrust is on production of Computer Aided Learning materials in the form of CAI packages, multimedia and books for an open-learning environment in addition

to the conventional classroom teaching. Premier institutes like University of Calcutta have entered into a strategic alliance with NIIT (National Institute of Information Technology) for providing courses through virtual classrooms, which allows two-way interaction between tutors and students, also an effective platform for discussions. IIT Bombay has started the program “Centre for Distance Engineering Education Program (CDEEP) as emulated classroom interaction through the use of real time interactive satellite technology to widen its reach of imparting higher level of education to all kinds of potential set of audience. The concept of digital libraries help the particular set of learners in a vibrant way as these libraries allow easy access to all kinds of knowledge forms like books, journals, research articles, viewposts etc. but also the main essence of having digitalized libraries is to focus on those deprived or remoted segments of the society who aspire for equipping higher level of education but bound by physical and territorial barriers. UGC is also encouraging creation of e-contents/ learning materials for undergraduate and postgraduate students in colleges and universities. E-Gyankosh which aims at preserving digital learning resources is a knowledge repository launched by IGNOU in 2005. In this, almost 95% of IGNOU’s printed material has been digitized and uploaded on this platform and this process takes place to keep it updated for the learners. Thus, there is no denial to the fact that with the elaborated existence of ICT in the domain of imparting higher level of education, the access, reach and availability of such kind of education has been possible and affordable through ease. ICTs lend themselves as an ideal mechanism to bridge the gap by complementing both formal education system as well as distance learning system. (Neeru, 2009). In 2017, SWAYAM came into existence. It’s a programme initiated by Government of India to take the efforts for making the best teaching and learning materials and resources available to all. It fulfills its objective by using its four main quadrants which are: Video lectures, reading materials that can be downloaded or printed, self-assessments tests through quizzes and lastly, online discussion forums for clearing of doubts and problems. So, it aims to enrich the learning experience by using the state of the technology involving multimedia tools, audio-video etc.

Case Study 2: ICT in Bangladesh

Starting from mid-nineties, the use of ICTs in schools rapidly expanded in developed nations through curriculum support, networking, the professional development of teachers and software improvements. (Aston & Mike, 2002).

But the history of Bangladesh has the recent use of ICT in its education sector. Ministry of Education of Bangladesh has recognized the widespread use of ICT for education imparting process thus its report of 2003 says ICT education is already made compulsory. It is also implementing the action of wide application of ICT in classroom teaching. The human resource development has these focus areas, namely, building e-learning infrastructure i.e., one school, one computer lab, smart classroom with e-learning facilities; ICT based education; Vocational ICT based training institutes and services for the youth. Also, the perspective Plan calls for making ICT education mandatory at the Secondary level by 2013 and also establishment of computer labs at the primary level by 2021 (GED, 2012). And the country has made many appreciable achievements in this regard. Government of Bangladesh took an effort to leverage the power of ICT in education sector with The National ICT policy, 2002 and its revised version in 2009. Key features of the revised policy include boosting the utilization of ICT and its tools in all levels of education including mass literacy, lifelong learning, establishing multimedia institutes, focus on establishment of ICT center of Excellence with necessary long term funding to teach and conduct research in advanced ICTs, creation of e-Education Cell for coordinating and mainstreaming ICTs in education system. In 2009, the idea of DIGITAL BANGLADESH was initiated by the Prime Minister to provide access of ICT to all. Many Non-Government Organizations (NGOs) and donor agencies have worked a lot in the direction of usage of ICT in the human capacity building process, namely, Grameen Bank and BRAC (Bangladesh Rural Advancement Committee) as these banks help in developing the scope for education for all by providing education loans and BRAC University promote advancement in research activities with the aid of ICT tools. In 1995, BRAC introduced the Continuing Education Program and thus established Gonokendros (Union Libraries) to provide training to students for use of computers at a low price and also to provide access to reading materials for the rural population in order to aim for full literacy. Then establishment of Bangladesh Open University was another step towards the applicability of ICT for higher education. This university came into being in 1992 which enables education through distance learning mode. The tools generally being used to deliver learning materials in the courses offered by this university are television broadcast, radio, audio cassettes, which are provided as a supplementary component of print-based delivery. In this context only, many other tools came into use like e-mail, teleconference, computer-aided learning etc. since 2000. Another very relevant step of initiating the use

of ICT in higher education was creation of the Education Management System, popularly known as BIDYAAN. For higher education in colleges, it is Best College Management System which allows for interaction of all the responsible parties – Teachers, students, parents, librarian, transport manager, administrator, HRM and Exam control on a digital platform and also help these concerned parties to make use of ICT tools for better interactions and results.

Case Study 3: ICT in Pakistan

The idea of using ICT in higher education is not recent for Pakistan. The establishment of many Open based Universities and also their working of imparting education based on the tools of ICT are really appreciable and certainly need significant recognition. In 1974, Allama Iqbal Open University (AIOU) came into being with its main aim to provide educational opportunities to masses using distance learning mode and that too with the help of modern information technology. This is the first university in Pakistan to have Student Database and Computerization at main campus and at the regional centers. It also has the provision of networking facilities between the main campus and the region to exchange data/information and to redress the students' complaints. There is also a well-established Institute of Educational Technology (IET) having the in-house facilities for production of TV, Radio, and non-broadcast programmes. "AIOU Magazine" is a regular television programme produced in IET studios and telecast fortnightly from PTV-National in the first and the third Mondays of each month (Source: aiou.edu.pk). The university is also having its own FM Radio and live FM radio transmissions are being made available for AIOU students (Vice Chancellor's Annual Report 2012 Pg#157). AIOU also has a model of ICT based education under the project "Open Learning Institute of Virtual Education" (OLIVE). It is basically a course repository that provides the students of AIOU the access to all the e-learning materials of the courses offered. The very important and notable documented example of the direct class teaching approach is Interactive Radio Instruction (IRI). Pakistan adopted its own IRI project in 1990s. This program basically consists of "ready-made 20-30 minutes direct teaching and learning exercises to the classroom on the daily basis". These radio lessons pertain to particular levels of mathematics, science, health and languages in national curricula with the focus to improve the quality of classroom teaching and to act as structured aid to under resourced schools. In the context of Pakistan, its main objective is not only to expand the educational access but also to raise the quality of education. Because of their

many advantages like cost effectiveness, positive impact on learning outcomes and provision of educational equity, these radio lessons turned out to be the most beneficial step in the field of education. In 1999, Pakistan's first public University that was completely based on modern ICT was established which is named "Virtual University" (VU). It uses free-to-air satellite television broadcasts and internet. VU aims at alleviating lack of capacity in existing universities while simultaneously tackling the acute shortage of qualified professors in the country. It provides real-time text-based communication in virtual environment. In this e-learning process, chats can be used by students to clear their doubts or raise any questions related to the subject (s), to give their feedback, even to indulge in group discussions. In 2002, Higher Education Commission (HEC) was created "to facilitate the transformation of Pakistan into a knowledge economy" (Atta-ur-Rehman, the former chairman of Pakistan's Higher Education Commission, 2007) and also to support higher education reforms designed to raise the standard of higher education in Pakistan. One of the most relevant features of HEC is its Digital Library (DL). HEC National Digital Library is a programme to provide researchers within public and private universities in Pakistan and non-profit research and development organizations with access to international scholarly literature based on electronic (online) delivery in the form of high-quality peer-reviewed journals, articles, databases and e-books across a wide range of disciplines. This initiative provides a wide range of information and knowledge available online, with easy access to all. Establishment of Virtual Campus at COSMATS Institute of Information Technology of Pakistan in 2008 was very accepting and welcoming step. Its main aim is to provide distance learning by making use of latest technology and its applications for e.g. video conferencing and internet for distance learning. Government of Pakistan initiated free laptop distribution scheme in 2013. The aim of the scheme was to distribute one lac laptops among talented students of public sector higher education institutions of Pakistan to increase access to ICT, to enhance the quality of education, and to promote research. Another one lac laptops were distributed among the eligible students under Phase II of the scheme in 2015. Phase III was planned in 2016. Phase II and III covered other ICT components besides laptops, like genuine software, technical support system, access for Internet, and HEC digital library (HEC, Pakistan, 2016). Higher education institutions have been spending large amounts in ICTs for the past two decades (Youssef & Dahmani, 2008) as integration of ICT in higher education adds the value of the higher education institutes for the social and

economic development (Balasubramanian et al., 2009). Another notable university of Pakistan which is DHA Suffa University, came into being in 2012, has its well established Learning Management System (LMS) which allows the students to have free online access to all the class based e-learning contents and also to related concepts and subjects and also to have easy interaction with their teachers and it also allows the teachers to have the facility of online evaluation to be conducted.

Common Threads

By studying the existing teaching learning environment existing in all the three countries which makes use of all the available and useful ICT tools, one can make a very vital point is that the advantage of ICT in education especially in higher education cannot be ignored and rather the use of ICT makes the efforts of gaining knowledge more fruitful and advantageous not only for the learner but also for the society as a whole. The kind of efforts, reforms and steps taken by the all the three respective governments is quite appreciable and recognizable in their own regard, given the political, social and geographical differences and its most admiring diversities, the efforts of each government has been quite effective in terms of outreach of the learning programmes to every individual or even to remoted groups pf people. Over a period of time, all the three countries have taken relevant steps to make use of the changing digital scenario around the globe by incorporating the use of ICT tools in the conventional domain of education learning. The existence of ICT and its varied tools in the field of higher education ease out the complications of learning, provides greater accessibility without much cost, and most importantly, makes the learning contents available to all potential pupils irrespective of geographical or any other barriers. The commonality in the steps taken by all three governments is the use of ICT in imparting higher education through the establishment of open universities which provide distance learning mode using all the possible and useful tools of ICT involving radio, television broadcast, video conferencing, etc. These universities work effectively for the higher level of education as these give a chance to learners to continue their work experience along with improving their educational opportunities which can further add onto their employability. Overcoming the barriers of geographical location, physicality and non-availability of resources and teachers, these universities make education plausible for all. In all these countries, the existence of e-content, tele conferencing, video lectures, discussion forums, creation of google groups, PowerPoint presentation

etc. help in continuation of learning process in distance learning form. The students also get enough opportunity to carry out research activities as their theoretical learning is not time bound or doesn't require physical presence like classroom teaching. The quality of higher education is not compromised as highly qualified teachers, authorities, corporate experts or sometimes bureaucrats, take up the charge of giving out lectures. The learning content is also not restricted to books, or specific references. The frequent discussions on contemporary economic, social, political, administrative, financial issues are also being taken place which helps in broadening the scope and vision of learning of the pupils. Across all the countries in the study, the establishment of digital libraries has been one of the prominent features of usage of ICT. These libraries help the budding researchers, learners, students pursuing higher education to access the learning material pertaining to any country/region with just one click on any issue or topic. Instead of physical effort to go to library or sometimes in the absence of well-equipped library in the vicinity, these libraries allow the usage of any learning material/ research material by any potential pupil, especially for higher education. The idea is to provide easy, cost effective and complete accessibility of reading and learning information. The idea of virtual classrooms has been another well-known concept of digitalizing the classrooms of education and this has been well represented in the higher education sector of these countries with initiatives like SWAYAM courses in India, virtual campus in Pakistan and Bangladesh Open University delivering courses via radio, television, broadcasts etc. The emerging concept of Learning Management System (LMS) could be another leading common thread between India and Pakistan as in India, many universities have undertaken their own LMS e.g. IIT -Kanpur and in Pakistan, DHA Suffa University created its own LMS, thus it seems that these initiatives by the respective governments present a huge scope of better ICT infrastructure for the pursual of higher education in the near future.

Challenges in the Usage of ICT

A coin has always two sides and similarly every initiative has its benefits and challenges. The existence of higher education sector in India, Pakistan and Bangladesh is quite well-known and much effective element of the education systems of these countries which has the sole aim of empowering the students of these nations with much higher level of knowledge thus building the human resource of the economy. But this process has much debatable yet significant challenges in its working which act as major hurdles in the system. In Pakistan,

many studies (Siddiquah, Salim, 2017) have shown that students frequently use internet more for their recreational activities rather than for academic purposes. Isman, et al. (2010), Ojo, et al. (2007), and Mumcu et al. (2004) claim that lack of ICT facilities and infrastructure in the workplace is significant barriers to ICT use. They conclude that a robust ICT infrastructure in higher education is a critical enabler and pre-requisite for knowledge driven development. This study also concluded that inadequate technological infrastructure is the main problem associated with ICT integration. ICT in education in Pakistan is a challenge as infrastructure is neglected particularly in remote areas. (UNESCO, 2014). High cost of Internet in Bangladesh poses a serious problem as it is affordable only to a small percentage of urban population. Until recently, Pakistan either gave little importance to or badly neglected the higher education, science/technology, and research despite the fact that there has been increasing participation in higher education with rise in enrolment rates from 1990 to 2007. (Boston Group, 2004). Slow speed of computers, signal problem in Internet, virus threat, poor working conditions of computers, load shedding and lack of access of internet are the problems faced by the majority of the students. Under funding for the ICT infrastructure and high cost of sustainability of technology in higher education sector are some of the disturbing elements for the nations.

Benefits for ICT for Higher Education Opportunities Across Countries

It is well noted that the existence of ICT in higher education sector has played a vital role in raising the quality of education and in improving the methodology of learning process, along with its own problems and challenges. ICT tools and techniques help in enhancing the learning skills, addressing the issue of lack of encouragement to new researchers, help in creativity, innovation in empowering knowledge, in incorporating new ideas without much effort, overcoming the barrier of physical presence, help in reaching out to the most remotest group of learners. The list is endless and so is the effect of ICT on education. Specifically, in higher education, ICT has the crucial part because of the complexities in the learning process at higher education level and many external factors affect the pace of pursuing knowledge like employment status of the learner, household responsibility of the female pupils, impossible situation of the learner to attend the classes physically. These disturbing facts associated with the learners and the learning process of higher education have been well addressed by the presence of ICT and its techniques. Across all these countries in study, the very existence

of ICT tools in higher education sector is well known and discussed a lot. So, the analysis of the benefits of ICT is also very important. In India, IGNOU has many essential initiatives using ICT tools like Gyan Vani, Gyan Darshan etc. and these have turned out to be highly beneficial for the strength of more than 35 lakh students enrolled in IGNOU as it is the largest university in terms of its students' intake. So, the number of beneficiaries is too huge spreading across the nation. IIT Kanpur has its own community radio service which serves the purpose of imparting additional pieces of information on many aspects generally not covered by the conventional education system, and also touches upon many social and literary aspects for students to have diversified learning environment catering to its strength of approximately 800 students. Virtual classrooms, an initiative under SAKSHAT have increasing number of users over the period of 2011 to 2018. NIOS is the world's largest open schooling system which initiated EKLAVYA for the provision of online courses and cater to the needs of lakhs of students ranging from Secondary level to Higher education level. Under Jadavpur University, School of Education Technology provide admissions to post graduate degrees with approximately 70 seats across all the courses like M. Tech IT, Masters in Multimedia Development etc. With around 1100 students enrolled in IIT Bombay, the availability of Centre for Distance Engineering Education Programme (CDEEP) offering recorded/ live courses cater to a large group of students and also the availability of such courses for all learners from any region/ institution make it a widely spread programme and very useful in the field of Engineering National Digital Repository, E-Gyankosh , provide reading and learning resources available for all and free of cost. The subjects ranging from literature to written communication provide ample of scope for learners and address every difficult pupil's needs. SWAYAM facilitate hosting of hundreds of courses from students belonging to class 9th to post graduation level to be offered by more than 1000 specially chosen teachers and lecturers. The formats in which courses are available range from video lectures to online discussion forums. These courses are available free of cost for all learners across the globe. In Pakistan's AIOU, over 13 lakh students have the access of modern information technology for their courses and distance learning options available for many. In DHA Suffa University, facilities of online content materials and interaction forums are being enjoyed by around 2000 students with internet accessible across the campus. The IRI program aims to improve the quality and enhance the equity of education thus providing significant learning gains for all the participants closing the urban-rural education and most importantly, increased

access for school dropouts so this program was currently reaching out to approximately 120 classrooms, in both urban and rural areas. In HEC National Digital Library, around 75000 number of electronic contents has been made available through Digital Library Programme (digitallibrary.edu.pk). In Bangladesh, BRAC University cater to around 10000 students aiming for higher education and through Continuous Education Program. Multipurpose Community learning centers, popularly known as Gonokendros started as community libraries, giving access to all for accessing reading and research content pertaining to all fields. These centers have an average of 400-500 members, providing IT and other vocational training in the fields like computers, livestock rearing, horticulture, poultry etc. These have books, magazines, newspapers and many other learning materials, also meeting space for members (including adults and children) to discuss their views and interact with each other. Thus, these institutions basically fulfilled their main objective of using ICT and its tools in the provision higher level of education and knowledge, for the betterment of the segment of the society aiming for higher education and research thus in turn, helping the economy to grow and flourish in all dimensions.

Conclusion

The idea of having ICT and its tools in the higher education sector has been very empowering and welcoming by the concerned parties. The institutions of the respective countries in the study have incorporated the essence of ICT in the horizon of education in a well established and developed form, fulfilling the needs of all kinds of learners, directing to every specific use. Traditional forms of teaching and learning are gradually changing their versions to virtual and online classes. These shifts point towards a broad and well-equipped zone of learning wherein physical or social barriers don't hamper the joy of learning. The existence of varied forms of ICT and its techniques in the higher level of education sector gives the impression of improved quality and highlights the better ways of educating the masses. The beneficiaries of such modern means of learning have been huge across three countries but the numbers have the complete scope of increasing in their magnitude without any difficulty as many learners are themselves attracted to this new way of education. The only requirement is to broaden the territory of usage of ICT in all levels of education and specifically focusing on higher level of education and research so that the learning at such a level does not get disturbed by the least relevant factors like distance, need of premises, classrooms, geographical barriers etc.

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