IMPORTANCE OF INFORMATION TECHNOLOGY

Importance of information technology in education of Pakistan

Sajida Mukhtar
(UMT Lahore)
Sajida.mukhtar@hotmail.com

Prof. Dr. Khalid Rashid
(UMT Lahore)

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ABSTRACT

This study was designed to serve as comprehensive development report on Technical education in Pakistan. In this context, the study aims to give particular attention to important changes that occurred in the information technology sector since independence. Information technology is concerned with the improvements in a variety of human and organizational problem-solving endeavors through the design, development, and use of technologically based systems and processes that enhance the efficiency and effectiveness of information in a variety of strategic, tactical, and operational situations. This article analyzes and assesses the current status of information technology in Pakistan.

Design/methodology/approach;

The study is a qualitative and quantitative analysis based on secondary information. The discussion concentrates on structure, access, quality, and future prospects of information technology in Pakistan. It is argued that if quality does not match quantity, and the information technology sector fails to bring out enlightened, highly skilled, trained, motivated and ethically committed individuals, the countries cannot meet any of its development objectives.

Findings;

To attract the brightest students towards information technology in different paradigms. Educate others about the benefits of educational technology. Enhance your educational experience by taking an online course. Join an organization that aims to create educational opportunities or improve education through technology. IT products make the learning environment interactive and engaging, providing for superior assessment of comprehension, increased performance, automatic grading, and increased productivity.

Keywords: IT. HEC, GNP, LPG, LMS
INTRODUCTION

Islamic Republic of Pakistan is bordered by Afghanistan in the northwest, Iran in the southwest, the former USSR and China in the north, India in the east, and the Arabian Sea in the south. It is a Muslim state formed after partition of India in 1947 into two separate parts—west Pakistan and East Pakistan. East Pakistan, which is now Bangladesh.

The education is becoming one of the defining enterprises of the 21st century with the emergence of globalization and increasing global competition. In the fast changing and competitive world, education and technology are the master keys for respectable survival and progress of Pakistan. Pakistan is determined to respond positively to emerging needs, opportunities and challenges of globalization. Education is being considered a key to change and progress. Progress and prosperity of the country depends on the kind of education that is provided to the people.

Education assists harmonious development of the individual. It increases the economic, social and political adjustment of the individual in the society. Education is an essential prerequisite for an efficient and equitable development process. It is a recognized fact that without a minimum education level for the entire population, a human centered development process cannot be sustained.

Human aspect of development has not been given due consideration in the past and now it demands special attention in order to facilitate all segments of the society. It provides people greater opportunities and choices to improve their lives.

In other words through the process of education, human beings develop such abilities, skills and attitudes that help them to modify their behavior according to social, economic and political demands.

Education is considered the most important way of human capital formation, which is prerequisite for sustaining the development of nations

(Mercy N. Fodje) The combination of education and technology has been considered the main key to human progress. Education feeds technology, which in turn forms the basis for education. It is therefore not surprising that to be “developed” is to have had education based on western knowledge, science and technology. This today is considered as progress.
For the majority of underdeveloped countries the quality of life is deteriorating despite several decades of development efforts. Economic growth has stagnated, with GNP per capita insignificant compared to the higher income countries. As if to make matters worse, population growth is higher in these countries and is accompanied by increasing poor health, a disproportionately high level of poverty and hunger, low educational levels, increasing civil strife, and a deteriorating infrastructure base. The gap between the Developed’ and ‘Underdeveloped’ countries is therefore widening by the minutes. Fortunately, the emergence of several powerful institutional forces such as the information revolution and the democratization of ideas are changing the global economy by affecting the relationship of markets, products, competition and trade. For The first time, developing economies have a chance to leapfrog over certain cumbersome development steps and constraints to speed up the development process, if only their educational systems, which feed technological development with the necessary skills, is overhauled (Fiske 1997).

Birth and the Growth of Information Technology in Pakistan

We may find the theoretical foundation of Information Technology/Computers in 300B.C but the practical implementation of the modern computing era started when Alan Turing named the machine as a computer in 1940 which rapidly grew and the field went into the research of building intelligent machines; resultantly in 1945 two years before the independence of Pakistan the first Neural Network Machine was created and was named as perception Mark I. The computers came to Pakistan in mid 60’s when second-generation computer was installed at Karachi. Presently, there are over 1800 mainframe and minicomputers, about half of which are in the government sector. The growth in the number of computers during the last ten years was over 35%. This has been possible due the governments liberal import policy and reduction/removal of duties It is estimated that there are roughly 450,000 new computers every year in Pakistan.

While this seems a pitifully the small number, it represents a three-fold increase Compared to 1996- 1997. Analyst predicts that this number will increase 4-5 times in

The next three years.
The place of Technology in a revised educational system

The mention of the use of multimedia and information technology in education in the poorer Sub-Saharan countries may be followed by questions of finance. As a matter of fact, achieving quality education in these countries by use of information technology is a far cheaper alternative. Most educational institutions in these countries lack quality facilities, journals, conferences, etc. The quality of educational materials is often poor. Library collections have become out of date. Laboratory equipment is most often old, in disrepair and out-of-date, while current budgets for consumables are lacking.

It would seem almost impossible for these countries to setup efficient educational systems but for the availability of multimedia and information technology. Efficient growth bases with vast multimedia content can be setup at a minute fraction of the cost of setting up modern facilities comparable to that of developed countries. With the advent of the internet and World Wide Web, and already existing knowledge bases, many educational institutions will be able to make use of the same resource thus further minimizing the cost requirement. The internet opens up a way of exponentially expanding the physical limits of the school, giving students and teachers access to each other, experts and resource around the world. Information technologies help create more equitable and accessible education systems. Students can use technologies to access courses not available at their school; rural students can complete their studies without leaving their communities, and adults can take advantage of a more flexible study schedule. Cultural development will also benefit as knowledge-bases of art, culture and history can be easily created, made widely accessible and easily updated.

Governments should therefore set as a task to make the internet as widely available to their people as possible. Part of the costs of financing this trend should be borne by the private sector as they are beneficiaries of the more vibrant and dynamic workforce it produces.

(Sharma, 1998), Information technology is an amalgam of some wonderful inventions of the 20th century in electronics and communication. During a very short span of time it has acquired an important place in almost all aspects of human life and particularly in the field of education. Underdeveloped countries have taken some bold steps to adapt and absorb the advances in information technology by constitution of national task force. At the same time
globalization having opened the doors wide to alien influence, the governments have decided to take all steps to make countries an IT super power by adoption of IT as a national program so as to enable personal and national growth. The IT ‘Action Plan’ intends to involve all walks of life e.g. education, industry, commerce, banking, insurance, finance, revenue, communication, media, human resource development and defense etc. The steps taken facilitates in providing effective education in almost all disciplines and particularly for the business schools, to use newer technologies so as to ensure better management education to all (Sharma, 1998).

For the majority of underdeveloped countries the quality of life is deteriorating despite several decades of development efforts. Economic growth has stagnated, with GNP per capita insignificant compared to the higher income countries. As if to make matters worse, population growth is higher in these countries and is accompanied by increasing poor health, a disproportionately high level of poverty and hunger, low educational levels, increasing civil strife, and a deteriorating infrastructure base. The gap between the

Quality education is a universal goal. It is common to hear arguments that instructional technology will be the key to educational quality as we enter the new millennium (Fiske and Hammond, 1997). Investment in educational technology is urged upon policy-makers as the path to educational quality (Mergendollar, 1996). In fact, enthusiasts for educational technology argue that quality has and will continue to increase rapidly, creating a "new educational culture" (Connick, 1997). Whatever problems exist are seen as ones which can be handled through better administrative and technological planning - that is, technology believers perceive no intrinsic obstacles to total quality assurance using information technology in higher education (Roth and Sanders, 1996).

Definitions of information technology

Information technology involved with the transmission and storage of information, especially the development, installation, implementation, and management of computer systems within companies, universities, and other organizations. Stands for "Information Technology," and is pronounced "I.T." It refers to anything related to computing technology, such as networking, hardware, software, the Internet, or the people that work with these technologies. Many companies now have IT departments for managing the computers, networks, and other
technical areas of their businesses. IT jobs include computer programming, network administration, computer engineering, Web development, technical support, and many other related occupations. Since we live in the "information age," information technology has become a part of our everyday lives. That means the term "IT," already highly overused, is here to stay. (http://www.answers.com/topic/information-technology#ixzz1CV8uRrHr)

In the broadest sense, information technology refers to both the hardware and software that are used to store, retrieve, and manipulate information. At the lowest level you have the servers with an operating system. Installed on these servers are things like database and web serving software. The servers are connected to each other and to users via a network infrastructure. And the users accessing these servers have their own hardware, operating system, and software tools.

Technology tasked with processing, storing and communication of information eg computers, mobile phones, PDAs. Geographical effects have been widespread as the advances in IT have begun to dramatically change behaviour eg working from home, reducing business trips, shopping from home. (www.tuition.com.hk/geography/i.htm) The term "IT" encompasses the methods and techniques used in information handling and retrieval by automatic means. The means include computers, telecommunications and office systems or any combination of these elements. (www.intosiitaudit.org/directory/misc/glossary.html)

Subjects taught at all levels from school to university concerned with all aspects of programming and operating computers or using data and systems generated by the use of computer for business or technical developments. (www.ceresconsult.demon.co.uk/html/glossary_of_terms.html)

Literature Review

Alfred Bork is a leading educational technology guru, having for years headed the Association for Computer Machinery's Special Interest Group on Computer Uses in Education and having advised on this subject for the National Institute of Education and having been named
Outstanding Computer Educator by the Association of Educational Data Systems, among other honors. In 1999 Bork was interviewed by Educom Review, the journal of EDUCAUSE (formerly EDUCOM), the leading association of colleges and universities for the advancement of educational technology. In this interview (Educom Review, 1999), Bork set forth several aspects of his vision of "the future of education:"

Education will become highly;

1. Interactive, engaging the student every 20 seconds or so for a response, much in contrast to present-day passive lecture methods.

2. Individualized, with world-accessible records of learning attempts by particular students, to enable computer presentation of education tailored for each student's past learning experiences and styles.


4. Accessible, opening opportunities for the disadvantaged in this country as well as for the millions in developing nations.

5. Computer-mediated, replacing (not supplementing, which would be an added cost) the lecture method in courses for 15 or more students.

Distance education will begin to displace campus-based education because the high costs of an interactive computer-mediated course can be justified only through their use by a large number of students than only distance education can provide.

In Bork's view, "Teaching faculty, in the sense we know them today, may cease to exist, except for in small, advanced courses" (p. 49). He foresees the conversion of large, lower-division courses - about 50% of university teaching - to online formats, resulting in "significant improvement in learning, at lower cost" (p. 50). He warns that those institutions which do not go this route may prove unable to survive the competition of the coming era.

Bork is hardly the only technology spokesperson who believes that computer-mediated distance education will spell the end of the traditional university as we know it. George Mason
University's Peter Denning (1997) made such an argument before the National Science Foundation, basing himself on four arguments:

(1) The library as a physical place is soon to be replaced by digital libraries accessible worldwide by almost anyone.

(2) The "community of scholars" around the library is soon to be replaced by communities of specialists linked electronically, divorced from geographical location.

(3) The ideal-typical small undergraduate class has become unaffordable and cannot compete with commercially-provided education on the same subjects, such as computer science, nor can universities compete with commercial courses' glitz and entertainment production values.

(4) Job structure has changed such that universities can no longer hope to prepare students for or promise them a "lifelong career", the central selling point of higher education until recently.


Carole Barone (1996: 28), Associate Vice Chancellor for Information Technology at the University of California-Davis wrote of traditional disciplines, "Can our campuses afford to teach those disciplines in the same manner as they have for decades or centuries? I would argue that most cannot... Technology costs money, lots of money... To pay for it planners and managers, at all levels, must engage in the unpalatable exercise of budget reallocation.

Increasingly, nations need a skilled, knowledgeable workforce and a citizenry equipped to function in a complex world. Competent workers and citizens, in turn, need a sound understanding of science and mathematics; elementary and secondary schools are responsible for ensuring that they acquire this knowledge. Yet in the United States in recent decades, few parents, policymakers, legislators, or educators have been satisfied with student achievement in mathematics and science. This dissatisfaction has spawned numerous efforts to reform and improve schools.

Twenty years have passed since *A Nation At Risk* urged higher academic standards, better teacher preparation, and greater accountability for schools as ways of improving student
achievement (National Commission on Excellence in Education 1983). Other reports and commissions subsequently set ambitious goals, among them that U.S. students would rank 'first in the world in mathematics and science achievement by the year 2000' (U.S. Department of Education 1989). When 2000 arrived, another national commission concluded that U.S. students were 'devastatingly far from this goal' (National Commission on Mathematics and Science Teaching for the 21st Century 2000).

Seeking to give school reform efforts new momentum, the Federal No Child Left Behind (NCLB) Act of 2001 introduced strong accountability measures for schools, requiring them to demonstrate progress in boosting student achievement. (This act became law in 2002.) The act specifies steps that states must take and timelines for their implementation; these steps included immediate development of standards for mathematics and development of standards for science by academic year 2005. (Academic year 2005 refers to the school year that begins in fall 2005.) The NCLB Act also requires school districts to assess student performance every year in grades 3 through 8, beginning in academic year 2005 for mathematics and in academic year 2007 for science. Schools that do not demonstrate progress in improving achievement for all students will initially receive assistance, but they subsequently will be subject to sanctions if they still fail to show improvement.

Impact of Technology on Delivery system

In most of the business schools knowledge and information are delivered with teaching aids like slide projector, overhead projector and LCD projector. However, in distance mode of learning various other tools like audio-visual tapes, broadcast on radio and telecast through T.V., teleconferencing through satellite, floppy diskettes and CD-ROMS, networking via ERNET and INTERNET and direct to home DTH technology are being used or may be used in a big way to impart management education in remote areas also. With access to internet, the learners have a reach to an unrestricted pool of knowledge, through the Web T.V. while operating at their home. Hence the homes will come to harbor the Virtual‘ class room. With the help of broadcast T.V. the best available professionals, emeritus professors and functional specialists can interact directly to a large number of learners. In remote areas where networking is not available or may not prove cost effective CD-ROMS run on a multimedia PC are treated to be the best
option of taking business education. Huge information, data, figures, pictorials, documents, graphics may be stored within them along with audio and video effect. Further internet communication is a very useful medium of imparting knowledge as classroom situations may be created at home with the access to E-mail and web browsing on the World Wide Web, which is now commonly available due to the launch of web television. Computers play a useful role in creating learning material. Through multimedia symbiotic advantage may be gathered by integration of various types of information such as clip art, animation graphics, music, voice and live interaction that makes the delivery effective. Digital multimedia has made T.V. interactive. It has elevated its functionality to information delivery and education. The consumers of this information have a choice to call for information they need. A selected program can be viewed at the convenience of the viewer and not when relayed. Multimedia computer can be used for training on management education in a one-to-one situation with the student. Multimedia system is treated to be more learner friendly as compared to T.V. as it enables to control the response of instruction transfer process as per the pace of the learners grasping capacity and preference so as to purposive and situation specific interface with the available information package. This creates an identical condition to the classroom on computer monitor without engaging a teacher and the given package can be browsed again and again by the learner to match with his or her own learning process.

In management discipline students come with mature personality. Computer based learning provides them an opportunity for self growth rather than being taught which stimulates them as they themselves make an appraisal of their achievements in the learning process. On the other hand teachers may also concentrate themselves on development and research related activities as they are relieved from routine monotonous tasks such as tasking, drill, practice and sharing of information. Hence, the new system reduces dependence on conventional and less cost effective infrastructure on elements of learning and also avoids wastage of time to assemble in a class room. It is now realized that IT tools have some relative advantages as compared to conventional mode of information sharing. This generates the need for computer which is not only useful in sharing knowledge but also imbibes skills required in a prospective manager such as conceptual, behavioral, analytical and administrative. In business schools case
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studies, workshop, project work, business games supplements conceptual learning. To develop the ability to apply knowledge in real life and hypothetical situations different soft wares are developed. Now-a-days most of the management literature is also published with CD ROM to provide visual effect to printed material.

Electronic Library and Networking

The impact of IT on University libraries and more so on the business school libraries is bound to be drastic, if not detrimental. The print material is forced to beat a retreat. The libraries of future will be called electronic libraries. Instead of books, these will have optical disks which could be used at home or anywhere through a small portable electronic reader. Computer applications to library and information field increase the efficiency of the day to day library work. An electronic computer network connecting millions of computers all over the world is the Internet. It provides the path for the continuous flow of data among computers using protocol software. It is the information superhighway. Its basic applications like ftp, email and remote log-in allow flow of information. Its various tools like Gopher, and Archie allow for fast access to reliable data. Its various services like Usenet service, Telnet service etc. further enhance its capabilities. Internet is the fastest medium of access to information of all types at the click of a mouse. It is an essential element in libraries today, which is providing new dimensions to the way libraries acquire process, store and disseminate information. Today most of the business school libraries have access to online information service and have acquired CD ROMs and have mounted them on networks with wider access. The goal of better management education, however, can be served by taking a more focused approach of building internet that connects the management institutions similar to Indian Institutes of Management and can be utilized by member institutions only. The Intranets may be implemented to connect business schools in each state or those on common platforms. The tools necessary to share resources will include use of internet connectivity through DOT, VSNL, or other ISPs, web browsers and security firewall as the heart of Intranet. It will require software packages for discussion forums, network electronic bulletin boards and list servers for low volume discussion groups as well as for member institutions with the limited connectivity and bandwidth. Many applications can be administered on the business educational Intranet such as sharing of library
resources, projects and research work, faculty interaction and collaboration, student placement
information and video conferencing.
To conclude with, through libraries today we have moved from documentation to information
and in the next decade will move from information to knowledge.
Impact of IT on Distance Education
We are passing through the age of information technology. The new technology likewise other
areas have helped in improving distance education for management program. With advanced
communication technology, teaching learning process has become faster, nonconventional and
interesting. Distance education is the fore-runner in exploiting the potential of information
technology so as to reach the learners, teach them, while assuring also its future, especially in
the third world countries like India. Distance education acts as a social catalyst in developing
countries and supports the objectivist model of knowledge transmission. Peters has observed
three important features of distance education: first, the use of technical media; second, the
mass education of students at a distance,; and third, the industrialization of teaching process. It
is felt that distance education must adapt new technology tailored to individual learner within
the Indian environment. However, the technology should be cost-effective, interactive and
innovative. During last 20 years the Open University system has shown substantial growth and
development, both quantitative and qualitative. At present there are ten open universities in
the country including the Indira Gandhi National Open University (IGNOU). Most of them are
offering management education. IGNOU is the fastest growing education system in the world,
with over six hundred thousand students, more than fifty programs comprising over six
hundred courses. It is the largest university in the country and the second largest in the world.
The cataclysmic changes taking place in the telecom and IT sector are being increasingly
absorbed by the university and now it plans to install VSAT based terminal across the country.
In an attempt to implement an interactive ETV for distance learning program for management,
the IGNOU has conducted teleconferences for
1. Distant students
2. Counselors handling counseling sessions at study centers
3. Regional Directors and supporting staff of the university.
The interactive network system has three basic components viz
1. The teaching end,
2. The receiving end, and
3. The space craft

IT Education for Prospective Managers
With the advent of the new millennium, Internet based computer hardware and software will usher in. Most of the business schools in Pakistan are now plentifully supplied with PCs and related technologies. However, most of the machines are under utilized. After earning degree in management, majority of the students aspires for employment in industry, commerce and service sector. Employers in these areas with that their prospective managers should not only be qualified in different functional areas of management but also possess necessary knowledge regarding popular application software packages, application programming and also understanding about how the PCs may be used optimally at their placement situations. It is suggested that initially an exposure of basic concepts of hardware and software, word processing, spreadsheets, Database, Network and Internet is adequate.

Information Technology Reforms
Primary focus of HEC is higher Education development however recently HEC has begun information technology reforms (called e-reforms) while it aims to improve situation of social sector primarily reduction in poverty and challenges of economic stability. Main E-forms programs are following:

1. Pakistan Educational Research Network (PERN)
2. Pakistan Educational Research Network 2 (PERN)
3. Digital library
4. Pakistan Research Repository (PRR)
5. e-learning
Curriculum

4 curricula in Information Technology and Telecommunication have been modernized and revised twice in the last 7 years and the 3rd revision is under process to add innovation and bring it at par with international standards covering the following subjects.

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Development Projects

49 Development projects in Information Technology have been approved.

Training courses/workshops

8 Courses / Workshops held during 2002 – 2008 in Computer Science with 217 participants.

Foreign Scholarships

About 518 scholarships in the field of Information Technology and Telecommunications have been awarded for studies in technologically advanced countries (Austria, Australia, Canada, China, France, Germany, Italy, Netherland, New Zealand, South Korea, Sweden, UK, USA, Thailand, and Norway).

Indigenous Scholarships

415 Scholarships awarded in the field of Information Technology and Telecommunication.

Seminars/Conferences

40 national / international seminars/conferences have been sponsored to consolidate / share our academic and research experiences/ achievements at national as well as international level along with giving international exposure to teachers and researchers in their respective fields.

Travel Grants
266 Cases of Travel Grants have been approved mainly to the faculty of public and private sector universities and degree awarding institutions for presenting their research papers in International conferences abroad.

Tenure Track System

25 Assistant Professors, Associate Professors and Professors had joined in Universities under the Tenure Track System in Computer Sciences.

PhDs. produced by Pakistani Universities

15 PhDs. had been produced by Pakistani universities in Computer and Information Technology.

Ph.D. Supervisors

88 Approved Ph.D. Supervisors in Computer Sciences are working in universities in Pakistan.

Accreditation Council

The Higher Education Commission approved the establishment of National Computing Education Accreditation Council.

National Research Programme for Universities

13 Research Projects are funded by the Higher Education Commission in Information Technology.

CONCLUSION

In developing societies like Pakistan the problem is not poverty, low production, and low level of per capita income or GNP. The real problem is that we are not adequately and professionally managed. Most of our industrial and service sector units are either under managed or unmanaged. Therefore, what we need is managerialisation of all the institutions in our eco-socio System. This requires a large number of professionally qualified managers. In India there is a need of management education for all. The growing demand of managers in various segments of economy may not be met with campus centric management education. Through open and distance mode of learning equipped with advent of modern information technology
we may develop a cadre of qualified managers to solve most of grave problems of the country. With the liberalization, privatization and globalization (LPG) of economy, we are in the transformation process from being a technically backward country towards being at par with rest of the world in the 21st century. This transition phase has thrown up many challenges and opportunities which need to be exploited and managed to restructure the education system in general and management education in specific for a bright future.

The strengths of IT advancements can be harnessed for re-framing the management education during this process.

Information technology is very helpful for the head teachers, teachers and students in learning and betterment for the school discipline; to help the policy maker in policy making and its implementation, to create the change in teaching methodology, to refine the teacher structure. Educational technology, the incorporation of information technology into the learning experience, is a term that continues to evolve alongside technological advancements in the field.

The issue of educational technology has played a major part in improving the learning outcomes of individuals by personalizing the learning experience. The immediate responsiveness of computer based programs, and the self-paced private learning environment that educational technology warrants seeks to promote higher levels of motivation among students worldwide. It has also provided greater access to education such as in the case of increased accommodation for students with severe physical disabilities and for students living in remote locations.

Educational technology has made the attainment of education possible for diverse groups including those in remote areas of developing countries.

Only Audience Response Systems can engage today’s learners and instantly provide feedback for teachers to validate student achievement. -IT continues to lead in Global Response solutions through innovation, reliability and value. -IT Provides Support for easy integration into your Learning Management Systems (LMS) – Whether you are using a LMS system or not. IT provides you a simple framework for passing roles, grades, attendance, homework assignments and
other school work activity easing the burden of Professor's and Instructor's administration
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