ISSN (Print): 2278-0793
ISSN (Online): 2321-3779

ROLE OF ICT IN RESEARCH

Renu Bala
Research Scholar, Dept. of Lib. & Info. Science,
Baba Mastnath University, Rohtak
Rimpi Rani
Research Scholar, Dept. of Hindi, DBHP Sabha
Dharwar (Karnatak)

Abstract
Information and communication technology is a top national objective in many countries, often enshrined in laws that govern the sector. One of the distinctive features of human beings is their ability to acquire knowledge, and what makes this knowledge an ever-thriving entity is man's ability to 'impact' this knowledge to others. The rapid development of Information and Communication Technology (ICT), particularly the Internet, is one of the most fascinating phenomena characterizing the Information Age. ICT powers our access to information, enables new forms of communication, and serves many on-line services in the spheres of commerce, culture, entertainment and education.
Applications of ICTs are particularly powerful and uncontroversial in higher education's research function. Four areas are particularly important: The steady increases in bandwidth and computing power available have made it possible to conduct complex calculations on large data sets. Another important dimension of ICTs in research is the use of online full text databases and online research libraries/virtual libraries which are the direct outcome of the growth in telecommunications networks and technology.
Keywords: ICT, Research, Computer, Internet, Networking.

Introduction

Ensuring universal service and access to information and communication technology is a top national objective in many countries, often enshrined in laws that govern the sector. One of the distinctive features of human beings is their ability to acquire knowledge, and what makes this knowledge an ever-thriving entity is man's ability to 'impact' this knowledge to others. Transfer of knowledge, which is one of the foundations of learning, is among the most fundamental social achievements of human beings. Building strong relationships with students is something that frequently explains why faculty takes pleasure in the challenge of working at a small university.
The rapid development of Information and Communication Technology (ICT), particularly the Internet, is one of the most fascinating phenomena characterizing the Information Age. ICT powers our access to information, enables new forms of communication, and serves many on-line services in the spheres of commerce, culture, entertainment and education. Over the last decade in the United Kingdom there has been growth in support for the use of technology within teaching and learning in Higher Education (HE). In particular, since 1993 the Teaching and Learning Technology Programme (TLTP) has promoted the creation of technology-based materials for use across the HE sector.

What is ICT?

Information and Communication Technologies (ICTs) are referred to as the varied collection of technological gear and resources which are made use of to communicate. They are also made use of to generate, distribute, collect and administer information. 32 ICT is a force that has changed many aspects of the way we live. Information and Communication Technologies consist of the hardware, software, networks, and media for collection, storage, processing, transmission and presentation of information (voice, data, text, images), as well as related services. ICTs can be divided into two components, Information and Communication Infrastructure (ICI) which refers to physical telecommunications systems and networks (cellular, broadcast, cable, satellite, postal) and the services that utilize those (Internet, voice, mail, radio, and television), and Information Technology (IT) that refers to the hardware and software of information collection, storage, processing, and presentation. The concept of a "Digital Divide" has been around almost as long as ICT has been publicly available. While traditionally it has come to mean a division in society, based on socioeconomic factors, this does not 'paint the entire picture'. Introducing ICT

ISSN (Print): 2278-0793
ISSN (Online): 2321-3779

as a tool to support the education sector has initiated substantial discussions since the late 1990s. A decade ago the emphasis was on Technical and Vocational Education and Training and training teachers. During the last few years, an increasing number of international development agencies have embraced the potential of ICT to support the education sector. UNESCO has played a major role in spearheading the Education for All initiative to harness the potential of ICT. The widely subscribed Dakar Framework for Action recognizes that, 'these technologies (ICTs) have great potential for knowledge dissemination, effective learning and the development of more efficient education services'. When looking at the integration of ICT to support the achievement of educational objectives, it can be found that after almost a decade of using ICT to stimulate development, it is not yet fully integrated in development activities and awareness rising is still required. The main objectives of the paper are to evaluate the importance of ICT in higher education and to analyze the government initiatives for development of ICT in higher education.

ICT in Research

Applications of ICTs are particularly powerful and uncontroversial in higher education's research function. Four areas are particularly important: The steady increases in bandwidth and computing power available have made it possible to conduct complex calculations on large data sets. Communication links make it possible for research teams to be spread across the world instead of concentrated in a single institution. The combination of communications and digital libraries is equalizing access to academic resources, greatly enriching research possibilities for smaller institutions and those outside the big cities. Taking full advantage of these trends to create new dynamics in research requires national policies for ICTs in higher education and the establishment of joint information systems linking all higher education institutions. The application of ICTs in academic research has grown steadily in the past 10 to 15 years in both developing and developed countries, although there are wide variations in usage both within and between countries and regions. The most straightforward use of ICTs in research is in data processing. The unprecedented growth in bandwidth and computing power provide opportunities for analyzing/processing huge amounts of data and performing complex computations on them in a manner that is extremely fast, accurate and reliable. Computer data processing not only frees researchers from the cumbersome task of manually analyzing data but more importantly facilitates quick and accurate analysis of huge amounts of data from national samples or even multi-national samples covering tens of thousands of respondents. Another important dimension of ICTs in research is the use of online full text databases and online research libraries/virtual libraries which are the direct outcome of the growth in telecommunications networks and technology. These databases and libraries provide researchers with online access to the contents of hundreds of thousands of books from major publishing houses, research reports, and peer- reviewed articles in electric journals.

General Benefits

● ICT provides opportunities for the teaching of historical enquiry, including the generation and testing of historical hypotheses and problems, as opposed to only learning historical facts.

● ICT and multimedia fit well with the multi-source nature of history – they can give a 'total picture' and can allow pupils to integrate evidence into their work (Hennessey et al., 2003; Brown and Purvis, 2001).

●The use of ICT promotes collaboration between pupils and can contribute to the development of historical thinking (Brown and Purvis, 2001).

Benefits for Pupils

● ICT helps to alleviate the constraints of writing and allows pupils to concentrate on the specific topic or discussion – this encourages reflection, analysis and understanding (Hennessey et al., 2003).

● Using databases to work with large volumes of data can help pupils to look for patterns, frame hypotheses, question accepted theories and place events into wider contexts (Martin, 2003; TTA, 1999a).

● The use of computer-mediated communications (CMC), including online

ISSN (Print): 2278-0793
ISSN (Online): 2321-3779

discussion groups, enables students to better develop and communicate historical arguments, thinking and understanding, and these skills can be transferred to essay writing (Thompson and Cole, 2003; Wellman and Flores, 2002).

●The use of hypertexts (documents embedded with hyperlinks) to investigate sets of historical documents and sources can help develop pupils' understanding and interpretation skills (Nichol et al., 2003; Brown, 2001), and allows pupils to see connections between historical issues.

● Computer simulations allow complex historical processes to be represented in a more dynamic way, and allow students to gain a better understanding of how key decisions in history were affected by the environment and the pressure of time (Taylor, 2003).

● Digital video can provide students with a model for gathering oral history before they conduct their own oral history interviews, allowing them to develop and retain the required skills more effectively (Wolfrum et al., 2001)

Benefits for Teachers

● ICT (particularly the internet), gives teachers access to a wide range of information, historical sources and media types, which would otherwise not be readily available (TTA, 1999a; Brown, 2001; Brown and Purvis, 2001).

● The use of computer-mediated communications (CMC), including online discussion groups, allows teachers to identify misconceptions in pupils' historical thinking, which might not otherwise have been apparent in more structured classroom discussions (Thompson and Cole, 2003; Wellman and Flores, 2002).

● ICT can enable teachers to present historical materials in ways most suited to individual and personal needs

● ICT can be used to help teachers support, or scaffold, the development of historical thinking and understanding at all levels (Wellman and Flores, 2002; Masterman and Rogers, 2002).

Factors for Effective Use

● Preparation in advance is critical when using the internet for historical research (Hennessey et al., 2003).

● ICT use in history teaching is most beneficial when coupled with effective teacher intervention, to ensure pupils learn at a good pace and can concentrate on the history rather than aspects of the ICT (Ofsted, 2002; Munro, 2000).

● Pupils need to be taught how to interpret information and make judgements and inferences about it, in order to make historical research using electronic sources more effective (Moore, 2000; Hennessy et al., 2003).

● When using a word processor to investigate a text, teachers must ensure the activity encourages effective comprehension of the content, and that it is not only a mechanical reading or cutting and pasting activity (Prior and John, 2000).

Effects of ICT on Research

ICT had effects on many facets of social science research. They can be classified into three categories which include: a) ICT application in pre-data analysis, b) ICT application in data analysis, and c) ICT application in post-data analysis. ICT application in pre-data analysis refers to examples how ICTs are applied on activities of social science research before reaching the stage of data analysis. ICT application in pre-data analysis includes:

i. Article Availability
ii. Thesis and Dissertation Availability
iii. Literature Search
iv. Content Search
v. Literature Tracking
vi. Quantitative Data Collection
vii. Qualitative Data Collection
viii. Big Data and Its Analytics

ICT application in data analysis includes examples how ICTs are applied on activities during the stage of data analysis and can be divided into:

i. Quantitative Data Analysis
ii. Qualitative Data Analysis

Lastly, ICT application in post-data analysis refers to examples how ICTs are applied on activities of social science research after completing the stage of data analysis which covers:

i. References and Bibliography Compilation
ii. Article and Thesis / Dissertation's Discussion among Researchers, Supervisors, Supervisees and during Viva Voce
iii. Plagiarism Detection
iv. Journal Manuscripts Submission

Conclusion

From the above description it is clear that the use of ICT in the field of research plays an important role. We have learnt many lessons from the above description These include the achievement of increase speed, increase quantity, improved quality, reduced complexity as well as lower the cost of Research. These productivity benefits are in concurrence with the findings from some research scholars like Sekaran (2003), Corbin & Strauss (2008) and Myers (2009). Through the use of ICT-based research tools, research cycle or duration can be shortened. With the use of ICT and the increase speed of research, more research articles, theses, dissertations et al. can be produced in which this will increase the knowledge contribution within the research community. Moreover, research quality can be improved as the use of certain ICT-based tools can improve accuracy and completeness of a research as evidenced in some ICT application areas e.g. qualitative data collection and analysis as well as in the references and bibliography compilation. Using ICT-based tools also can reduce research complexity as exhibited in the handling of complicated conceptual frameworks or complex big datasets which inherit characteristics like larger volume, greater variety, higher velocity and lower veracity. Last but not least, the reduction of research cost is possible with the use of ICT-based tools because less man hours are required as productivity of researchers had increased.

References

Sarkar Sukanta 2012. The Role of Information and Communication Technology (ICT) in Higher Education for 21 Century. The Science Probe, Vol. no.01 May 2012. Pp 30-40 ISSN, 2277-9566.

NCET, 1998. History using ICT: Searching for Patterns in the Past us.

Sandhu Kulbir Singh 2007. Methodology of Research in Education. Delhi: Sterling Publishers Private Limited.

www.becta.org.uk/research