

Role of ICT in Sustainability of Research: A Conceptual Framework

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Abstract: *Research and information and communication technology (ICT) both are complement to each other and the purpose of the research is to investigate ideas and uncover useful knowledge. ICT is the vehicle to the research process for driving it to destination. In today's age of globalization when the world is moving rapidly into the digital media and information the role of ICT is becoming more experienced in disseminating the information which is required for the research process. Sustainability of research is that quality research which can used, can guide in future research. This paper is based on the existing literature review related to ICT and research. This is descriptive kind of research which draws and explores the concept, idea of ICT in sustainability of research by drawing and discussing the conceptual framework on changing dimensions of the quality of the research and impact of ICT in value creation. The methodology adopted is discussion based on the series of widespread review of literature and explores the changing role of ICT in the work of research. It investigates how research overtime has affected and ICT has accelerated the research process. Data of the literature were collected and studied thoroughly. The findings suggested that the practice of ICT is strongly associated with research sustainability. It provides the comprehensive indications that research sustainability is important issue and it is of global nature. Apart from the research it is equally important in business social and environmental, economic growth.*

Keywords: Research, Information and Communication, Technology, Sustainability, Disseminate, Globalization, Economic growth.

1. Introduction

Research is the systemized effort to gain new knowledge (Redman and Mory). The purpose of the research is to discover answer to the questions through the application of the scientific procedure. Research is always the need for the development of logical habits of thinking and organization. In context of Hudson and Maxim "all progress is born of inquiry, doubt is often better than overconfidence, for it leads to inquiry, and inquiry leads to invention". The research method, methodology are cause of concern for the quality research.

ICT which is information and communication technology include computer, the internet broadcasting technology, radio and television all has contributed a lot in accelerating research and enhancing the quality of research. At present ICT are widely used for various purposes and almost every field, research field is one of them. In research work computers are not only used in searching information but also in analytical performing calculation computer have become one of the most useful research tools. In data analysis researchers are essentially concerned with huge storage of data, their faster retrieval when required and processing of data with the aid of various techniques. The use of ICT in research is of great help; they have reduced the human drudgery and added to the quality of research activity. They can perform many complex statistical calculations easily and quickly. The different information are made available to the researchers by computers in no time otherwise might have taken days or even months. The storage facility can make use of stored up data whenever required to do so. The results obtained from the computer are generally correct and reliable. A good research documents empowers readers to reach their own conclusion. Although the ICT has provided all the research facility even then the ethical practice in maintaining the quality is required in avoiding the plagiarism. Quality research requires judgment and honesty. It carefully

evaluate information source. It acknowledges possible error, limitation and contradictory evidence. Research means lengthily, focused and specific interest with continuous improvement in the technology from the past decade have really means difference to the world.

2. Research Question

The main research question is what is the role of ICT in sustainability of research? My study will focus around finding the answer of this question.

3. Literature Review

Guruprasad et al (2012), in their paper tried to describe the significance e-resources information dissemination throughout the world by scholarly scientific pursuits. They describe the use of e-resources because of quick easy access and convenience. The study was restricted to city of Bangalore and selected e-publishers by the survey though questionnaire and main conclusion was that e-journals are an important source of scientific scholarly information. E-journals have tremendous impact on their scientific research inspiring collaboration and joint research work resulting in faster completion of task, resolving technical problems, enormous time saving in terms of articles retrieval or time spent at the library immensely help in publishing more scientific paper. Studies implies that 'use pattern of e-journals from reputed e-publishers' by the aerospace engineers of the selected 16 aerospace organization of Bangalore are dissimilar.

Maruthi G, Rajashekhara GR, Nagaraja Shastry GM in their study finds the advancement of information and communication technology has made a tremendous improvement and changes almost all walks of life, by conducting the research survey on the use of ICT in R&D libraries. The study was limited to only few selected library in Bangalore city. By applying the survey method

and questionnaire in studies, they observed libraries were having good infrastructure facilities like internet (90.56%), library website (60.24%), and online data base (72.28%). About 66% of research libraries have LAN and printer like other facilities. It was clear from the study that 70% of research libraries have accumulate ICT facilities, around 60% have partially digitalized their library.

Ulka Toro (Gulavani) and Milind Joshi (2012), in their paper the ICT and higher education is the today's need in enhancing research capabilities and provide for adequate infrastructures backed by capacity building. The study was conducted by reviewing the literature from the period of 2004-2011 on the ICT in higher education. Through the studies it was found that ICT provides students support services such as course outlines, digitally recorded classroom material, discussion groups, laboratory manuals and lab assignment, lecture notes, live lectures link to the course specific websites, online tutorials supplementary readings, and virtual office house for teacher-student consultation. Libraries are a particular boon to the students as they cut down on costs of acquiring expensive textbook. Journals and references material tools are available on the internet to assist both teachers and students to manage writing assignments to detect and avoid pitfalls of plagiarism and copyright violations. ICT improve the quality and the quantity of education provision. Technology facilitated learning has proven to be quite expensive in all areas of considerations, infrastructure course development and course delivery.

A research paper for (IDRC) Ottawa Canada by Giden Christian LLM (2008) his research paper focus attention on the importance of open access of institution, a repository which is a digital archive for the preservation and dissemination of institutional research outputs. He add the growth of open access in developed country but developing countries like Nigeria are still lack of awareness of open access institutional repository, inadequate information and communication technology infrastructure for his research paper concludes by highlighting the need for researchers to retain the copy right to their research works in other to have the capability to make such books available in open access repositories. This is possible through the use alternative publishing agreement. By means of an alternative publishing agreement, researchers are able to grant a limited right license to publisher to publish their work while the copy right in the work remains with the research or author of the work.

Paul Blackmore, Mick Roach and Jay Dempster, in their article study the use of ICT in education for research and development and described the means of bringing together research and teaching by focusing on the process of learning. It was believed that making use of ICT tools to make links between research and student learning make good sense. ICT can be a means of engaging more closely with development of the capabilities and cognitive skills they have traditionally been the concerns of higher education, even though they have traditionally been the concerns of higher education.

Rob Edmunds Mary Thorpe and Grainne Conole (2010), gives the study on students attitude towards the use of ICT by TAM model, found that usefulness and ease of use of all key dimensions of students towards techno in all three contexts, but that ICT is perceived most positively in the context of work and technology use at work is important driver for technology use in either areas. He finds in study students experience of work and their intentions towards particular career after study, could be used more directly to influence their use of particular technologies and heighten their awareness of the benefits of developing skills that enhance their effectiveness.

Archana Saxena in her study on the impact of ICT on academic libraries has find that electronic publishing has become a foundation for the new information society to get the right information to the right person at the right time. She studied the impact of electronic publishing on academic library system and radical changes in the publishing industries especially with the impact of electronic media and internet. She finds that with documents getting published electronically and the internet resources growing at the rate of 20 percent of a month, the selection document is going to be a difficult job. The 21st century librarian will basically become a resource sharing librarian whose resources will have no boundary, local, national or international. The services the librarian can offer to the users will compel them to create new methods of classifying and cataloguing internal resources. Developing such type of research which specializes in certain subject area only would interlink each bit of information which has relevance to anything else in the universal knowledge. In this changing scenario the librarian is going to be of highly skilled professional whose total commitment would be as a navigator to global intellectual resources as facilitators, instructors gatekeeper of knowledge, interpret, evaluators, consultants, researchers, information managers, the images of the librarians by playing all the roles successfully.

4. Conceptual Framework of Quality Research

Quality of research does not limit to only the use of ICT, it is interpreting and analyzing data easily and timely. The concept of quality research pertains to the scientific process, evidence quality pertains more to a judgment regarding the strength and confidence one has in the research findings emanating from the scientific process (Mosteller & Boluch, 2002, Shavelson & Town, 2002). In maintaining the quality of research, quantity and consistently quality research is the precursor to the quality evidence. In producing quality research, the overall study design, the specific research question methods, coherence, and consistency of findings influence the type and quality. Produced literature also suggests that in general a quality evidence base typically requires more than a single research. Quality research most commonly refers to scientific process encompassing all aspects of study design. In particular, it pertains to the judgment regarding the match between the methods and questions, selection of subjects, measurements of the outcomes, and protection against systematic bias, nonsystematic bias, and inferential error (Boaz & Ashby, 2003, Lohr, 2004, Shaverson &

Toune, 2002). This suggest that achieving only one or two standards is typically insufficient to assert quality, peer review and standardized are only the sole surety of the quality of research. Research should not only be judged by whether or not it is published in the journals (Boaz and Ashby, 2003). In addition to the items listed, another quality assessment is the strategy that is often mentioned in the bibliometric analysis, the citing of the research by other authors bibliometric analysis is primarily a measure of quantity and can be artificially influenced by journals with high acceptance rates (Close-up, 1999).

5. Discussion

Discussion is based on the literature review. Many researchers have contributed in the studies of ICT and its importance by going through the critical review of the literature. It was found that authors have all aspects of the ICT uses and contributed in maintaining the knowledge of the sustainability of the research. Literature review explores the changing role of ICT in the work of research. It investigates how research overtime appropriate ICT applicator as research tools. ICT researchers investigates that e-journals is the important sources of scientific scholarly information, e-journals, percentage of preference of the use pattern of e-journals from publisher which are available online can be of great help to the researchers in their research activity. The research paper shows the online library facility was of immense importance to the research in saving time and money and availability of the information at one point of time. ICT provides students support services such as course outlines, digitally recorded classroom material, live lectures, references material tools, the pitfall of the plagiarism and copywriting violations. ICT has improved the quality and quantity of the education provision all the institutional repository can be openly accessed. ICT can be a means of engaging more closely with development of those capabilities and skills that have traditionally been the concern of higher education. ICT for the research builds the innovative capacity and inventiveness and to the development of the country.

6. Conclusion

From all over discussion it is clear that to make the research sustainable. It is very important to make the research survive and grow by adding value to it. Adding value of the research is the outcome of research that can provide value to some end users. The end-user can be any body-business, government, future researcher. Without value there is no future for the research and the activity of the research and sustainability of the research can be achieved by quality maintaining. ICT has great contribution making avail the e-journals access, e-libraries, all other information and news changing of the education pattern i.e. digitalization of the education has all increased the understanding of the student, and thereby enhancing and creating the student skills.

7. Limitation and Future Research

The gap in paper exists as its findings are based on only literature review which is secondary sources of data. For

future studies can be done on the basis of primary sources of data, which could be more reliable and updated in context of research on information and communication technology (ICT). Upgraded information in the field of technology is vital.

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