ICT: A Key to Quality of Research Process

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Abstract

The present paper attempts to examine and explore the actualities & possibilities of quality improvement in Research work by using Information Communication Technology. The innovation of Information and Communication Technology (ICT) has revolutionized every spare of education including educational research. ICT not only provides help to researchers prior to initiation of the research work but also during the process and after the completion of the study too. The software packages & other ICT tools happen to help researcher in every step of the research i.e. gap finding, review of related literature, data collection, data analysis, report writing and, the last but not the least, presentation of the research work for written or oral communication.

Inputs from ICT provide a major source for gap finding or identification of the problem. There are numerous e-books, e-journals & other reading material available on internet, Books which are out of print, at present can also be searched through internet. These days facility of e-library is available which can be accessed from home itself. Inflibnet and Delnet are the national networks which provide researcher with online and CD ROM database. These sources help the researcher both in qualitative and quantitative kinds of research.

The advent of ICT has changed the very face of the process of data collections as well. Researchers need not approach the subjects in face to face mode for getting their responses to research tools, but can secure data through virtual means. Data can be collected through developed online tests, questionnaires and Computer Assisted Telephonic Interviews.

Data so collected can be analysed quickly and accurately using various statistical software packages. Some of the packages used for data analysis are: SPSS, SAS, Minitab and MS-Excel. Also Web Based statistics softwares i.e. Survey Documentation Analysis can be used for analysing data. Computational errors can be eliminated through use of these softwares. Testing the underlying assumptions of the test like normality of the data and homogeneity poses no problem. Some the latest versions of the softwares provide not only results but the interpretation of the results, i.e. the rejection or non rejection of the hypothesis.

After the completion of the research process, ICT helps to organise the entire research work in either hard copy or soft copy. Researchers can publish their research work in e-journals. It immediately makes the result of the research available to the academic and administrative community to use them for the betterment of the society.

Using ICT, researcher can get instant suggestions from experts and peers for formulation of the problem, data analysis techniques, and appropriateness of the tests
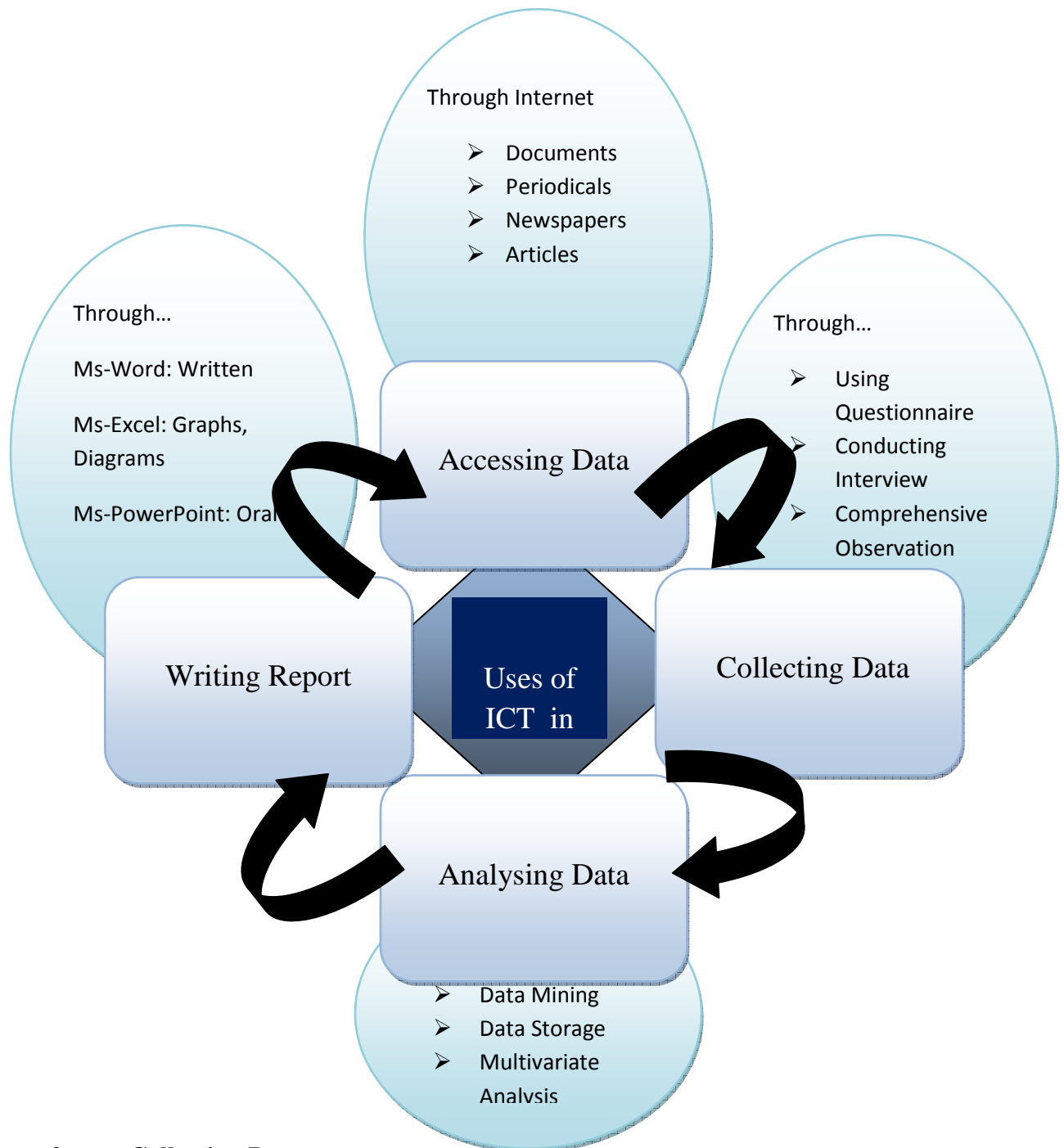
used etc.

1.0 INTRODUCTION

The term "Information and Communication Technology" (ICT) refers to forms of technology that are used to transmit, process, store, create, display, share or exchange information by electronic means. This broad definition of ICT includes such technologies as radio, television, video, DVD, telephone (both fixed line and mobile phones), satellite systems, and computer and network hardware and software, as well as the equipment and services associated with these technologies, such as videoconferencing, e-mail and blogs (UNESCO, 2007, p. 4).

1.2.0 USES OF ICT IN RESEARCH

ICT is used actively by the researchers in various facets of research. Some instances of use of ICT s in research are as follows:

1.   Accessing Data

ICT is a gateway of the world of information. A multitude of data i.e. documents, periodicals, newspaper and articles can be accessed using modern technology i.e. computers. Many encyclopaedias are available on CD-ROM. Through Internet researcher can search various sources. There are numerous e-books, e-journals & other reading material available on internet. Books which are out of print can also be searched through internet. These days facility of e-library is available which can be accessed from home itself. Inflibnet and Delnet are the national networks which provide researcher with online and CD ROM database. These sources help the researcher both in qualitative and quantitative kinds of research. By using ICT resources, researchers without physically moving to different places can access the researches done in different areas, in different universities. Search Engines like Google, Yahoo, Share Ware, Lycos, Web Crawler, Alta Vista have virtual room and help the researcher in finding the desired material from the available data on the internet.

Through Internet

- ➢ Documents
- ➢ Periodicals
- ➢ Newspapers
- ➢ Articles

Through…

Ms-Word: Written

Ms-Excel: Graphs, Diagrams

Ms-PowerPoint: Oral

Accessing Data

Through…

- ➢ Using Questionnaire
- ➢ Conducting Interview
- ➢ Comprehensive Observation

Uses of ICT in

Writing Report

Collecting Data

Analysing Data

- ➢ Data Mining
- ➢ Data Storage
- ➢ Multivariate Analysis

2. Collecting Data

Through Modern Technology i.e. computer, data can be collected online or through e-mail. Researcher can develop online tests & collect the data through online tests, e-Questionnaires, Interviews, and Comprehensive Observations, not only test but online treatment can also be given to the experimental group.

2.1 Administering e- Questionnaire

Researcher can develop a questionnaire in HTML, or Dreamweaver and collect the data. e-Questionnaire makes collection of information in easiest and economic way.

The chances of misplacing of hard copy of the Traditional Questionnaire are more than e-Questionnaire. e-Questionnaire can be sent safely and it will be lying for a long period in the respondents' mailbox. So through modern technology i.e. internet, it can be possible to collect the data from the sample which is spread over a wide area. Researcher can collect data from the large population at a time. Through these softwares responses of the questionnaire and the scores of the respondents can be got within few seconds.

2.2 Conducting Tele Interviews

By using video conferencing and teleconferencing, interview can be conducted easily. Computer Assisted Telephonic Interviews help to automatically select a number randomly and get the response from the subject. Computer Administered telephonic surveys go a step further where the computer even replaces the interviewer. Thus modern technology makes interview process more efficient and quick. Also group interviews can be conducted by using internet. Thus data can be collected by tele interviews at the rate of very low cost.

2.3 Making Comprehensive Observations

Close Circuit Television (CCTV) and web cam van help to observe the events comprehensively to get accurate information. It overcomes the drawbacks of traditional observation techniques i.e. participative and non participative techniques of observation.

3. Analysing Data

There are a large number of statistical packages available in the market which not only carry the preliminary task of editing, coding and tabulating but also perform complex statistical analysis. SPSS, (Statistical Package for Social Science) Minitab, SAS (Statistical Analysis System) and MS-Excel are the commonly available softwares. These softwares are powerful, reliable and easy to use. These can also be used by those researchers who have no knowledge of statistics or mathematics. SPSS is popular software for statistical analysis. This software covers both type of statistics i.e. parametric and non parametric. In new version of the software researcher can find results as well as interpretation of the results, i.e. the rejection or non rejection of the hypotheses. Such software can very easily be got through Internet. One can either purchase the licensed version of the software or download that software for limited period from **http://spss.en.softonic.com/** site. SAS is used to performing tasks like: Data Entry, Data Retrieval, Writing, statistical and mathematical analysis of the data. Data mining is a very useful application through which association between variables can be found. A large number of data can be easily stored in data ware house for retrieval and interpretation. Software packages perform complex analysis i.e. multivariate analysis in easy manner. If one can want to analyse more than three or four phenomena simultaneously it cannot be easily carried out manually, whereas it is possible through statistical packages. Thus, researcher can use modern technology for analysing the data. SAS software can also be downloaded from **http://www.sas.com/technologies/analytics/ statistics/stat/** site & Minitab software can be downloaded from **www.minitab.com** or **http://minitab.en.softonic.com/** site. Besides quantitative data analysis, a number of softwares are available for analysing

the qualitative data as well. QDA Miner, Atlas.ti, Dedoose, NVivo. SurveyMonkey etc. are the software which are used for qualitative data analysis. Dedoose can analyse both type of data i.e. qualitative and quantitative data.

QDA Miner is a qualitative data analysis software package which may be used for analysing the text documents as well as visual documents. This software is used for coding, annotating, retrieving and analyzing small and large collections of documents and images. It may be used to analyze interviews, legal documents, journal articles, speeches, even entire books, as well as drawings, photographs, paintings, and other types of visual documents.

Apart from these software packages, data can be analysed online. Users can perform online data analysis on Web site without downloading files. ICPSR currently offers online analysis components for selected data collections using Survey Documentation Analysis (SDA). STATCRUNCH is another web based statistics software through which we can analyse the research data. The website of that software is **http://www.statcrunch.com.**

All these softwares help to analyse the data in following manner;

- **Various analysis types are available**: frequencies and cross tabulation, comparison of means, correlation matrix, comparison of correlations, multiple regression, logit/probit regression.

- **Fast results**: All above mentioned software have been designed to produce analysis results very quickly. -- within seconds -- even for large datasets with millions of cases and hundreds of variables.

- **Creation of new variables with recode and compute procedures**: The softwares include procedures to create new variables based on the content of existing variables through recode or compute specifications.

- **Charts**: All the software produces various chart types: bar charts, stacked bar charts, line charts and pie charts, Box Chart. Interactive graphs etc. Also many softwares of statistics facilitate the researcher to formulate and transform the data output.

- **Error free computation:** If researcher analyse the data manually, errors may be possible, whereas through technology there are minimal chances of making error.

4. Writing Report

Modern technology helps the researcher in reporting the research in written, oral or graphical form. Researchers can communicate the results of their research works meaningfully through computer software. MS-Office helps the researcher to compile the whole research report from beginning to end. These days MS Word is frequently used in Report writing, Bibliography and Reference writing. It has facility to create table of content with chapterization simultaneously. Like this MS-PowerPoint assist to create PPT for the presentation of research work and MS-Excel deals with the data

for Graphical and diagrammatical presentation.

5.   Getting Online Suggestions

Through online, Researcher can get suggestions from experts and guide for all the above mentioned steps of Research i.e. for Identification of the problem, data analysis technique. They can also get comments related to appropriateness of the test etc.

3.0 Conclusion

Researchers need be skilled in use of computer technology, its developing the research framework, review of the studies, gathering research data, Analyzing the data, writing the research Report and presenting the research report. So, ICT remains a master key to the quality research in education.

Bibliography

Arulsamy & Sivakumar (2009). Application of ICT in Education. Hyderabad: Neelkamal Publication.

Brace et. al (2003). SPSS for Psychologist: A Guidance to Data Analysis using SPSS for Windows. Newyork: Palgrave McMillan.

Huizingh, E. (2007) Applied Statistics with SPSS. New Delhi: Sage Publication.

Oberoi, P.K. (2012). Research Methodology. New Delhi: Global Vision Publishing House.

Patton, M.D. (2002). Qualitative Research & Evaluation Method. New Delhi: Sage Publications.

UNESCO (2007). The UNESCO ICT in education programme. United Nations Educational, Scientific and Cultural Organization (UNESCO): Bangkok, Thailand.

http://en.wikipedia.org/wiki/Minitab

http://provalisresearch.com/products/qualitative-data-analysis-software/

http://www.atlasti.com/462.html

http://www.quantitativeskills.com/sisa/statistics/onewayhlp.htm

http://www.statcrunch.com/5.0/shareddata.php?keywords=free

http://sda.berkeley.edu/index.htm

www.unescobkk.org/education/ict.