

Effects of Information and Communication Technology in Social Science Research: Probability and Usefulness

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Abstract: Research is basically a systematic investigation and enquiry by studying the sources or materials so that facts can be established or a conclusion can be drawn in order to achieve the desired objective. Information and Communication Technology denotes Facts, technology and Communication or the amalgamation of diverse tools which contain the formation, achievement, storage, association, retrieval, dissemination, processing, explanation and spread of evidence to collect information as well as accelerate communication. However, Social science research is the empirical study of the social structure as well as social relations, in command to create facts about the human culture as well as contact original ends. The Information and Communication Technologies is progressively becoming crucial portion of the Academic system. Both information and communication technology (ICT) and Research are balance to each other as well as the objectives of research is to examine concepts as well as disclose valuable information. In globalization era the role of Information and Communication Technology is becoming a new instrument in spreading the evidence which is prerequisite for the research method. The Sustainability of research is a quality research that can guide and utilized in future research. In social science research, Uses of Information and Communication Technology are chiefly undisputed and influential in social sciences of higher education. The use of online complete text databases as well as online virtual libraries and research libraries is another key dimension of ICT in social science research that are the consequence of the progress in technology and telecommunications networks. The aim of the research article is to examine the effects of Information and Communication Technology in Social Science Research with its probability and usefulness.

Keywords: Information and Communication Technology, Networking, Research, Social science, Sustainability

I. INTRODUCTION

Research is the scientific work to achieve original information. By applying empirical and scientific procedure, the researcher is able to discover the answers of the questions in social science research. Research is essential for the growth of reasonable habits of thoughtful as well as association. In this context Maxim and Hudson argues that “everything growth is born of inquiry, and doubt is often better than overconfidence, for it leads to inquiry, as well as inquiry leads

to invention”. However, the methodology and research methods are the basis of concern for the quality research. In improving the quality of research as well as accelerating research the parts of Information and Communication Technology such as radio, television, computer, the internet broadcasting technology has contributed a lot. In contemporary times the Information and communication Technology (ICT) is extensively used for suitably conducting research related work as well as in improving the quality of research work. In fact, the computers are not only utilized in getting reliable data but also have become one of the most important research tools in analytically performing calculation of social science research. The social science researcher in data analysis are basically concerned with vast storage of data and their sooner recovery when essential as well as processing of data by the assistance of many methods. Infact, the use of the Information and Communication Technology in social science research is of excessive help and they help minimize the human labour and added to the value of research activity (Marmat, 2013). The Information and Communication Technology is the main player in three application areas i.e. Pre-data analysis, Data analysis, Post-data analysis and the Social Science research is mainly based on participative observation approach. However, there was several detailed research being conducted on how Information and Communication Technology has played a vibrant role in social science disciplines like in sociology, psychology, economics. But there are not much data on how Information and Communication Technology had converted the social science research as a whole (PETER, Role of ICT, Ethical issues and challenges facing social science research, 2013).

II. METHODOLOGY

The present study is based on qualitative research method due to its improved insights on the experience as well as context of utilizing Information and Communication Technology among the social science researchers. The research work is based on the current literature review related to research and Information and Communication Technology.

The present study is descriptive kind of research that attractions as well as



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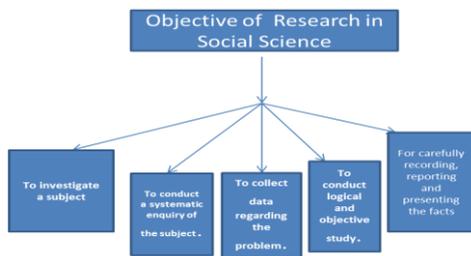
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discovers the theory, concept of Information and Communication Technology in sustainability of research by representing as well as arguing the theoretical and conceptual structure on changing dimensions of the excellence of the research as well as influence of Information and Communication Technology (ICT) in value formation. 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. In the secondary data the characteristics such as reliability of data, suitability of data and adequacy of data have been considered.

Concept of Research

Research is known as the unique examination for the improvement of information and search for something new. Clifford woody opines that, "research comprises defining as well as redefining difficulties, framing hypothesis or recommended results gathering, unifying as well as assessing data, creating deductions as well as getting conclusions; to determine whether they fit the framing hypothesis (Dawson, 2002)." The below mentioned flow chart has pointed out the main purposes of research in social science.

Flow Chart of the objective of Research (For Social Sciences)

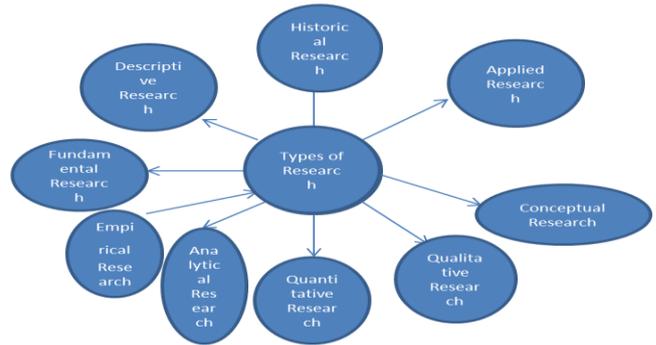


Flow Chart 1: Objectives of Research

Importance of Research

1. In our economic system Research offers the foundation for practically all policies of government.
2. Research assists in resolving several operative and scheduling difficulties of commercial as well as business.
3. Research is a support for decision making.
4. Research creates the relation among variables.
5. Research promotes a foundation for origination and helps the procedure of thoughtful assessment and explanation of various situation and analysis,
6. In reviewing social relationships and solving of social problems, the research is important for social science researchers.

Flow chart of Research Types



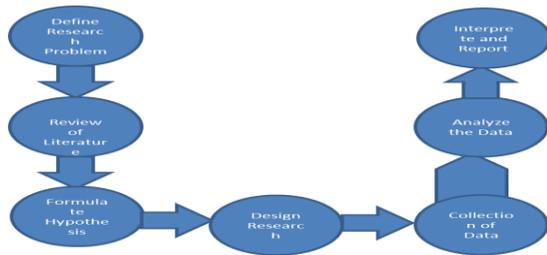
Flow Chart 2: Research types

The major types of research in contemporary research field are mainly as mentioned as below:

1. The Applied research, which is well known as decisional research and this research utilize the accessible information for the solution of the problems.
2. The Fundamental research is known as pure or basic research and it wants to spread the areas of information in a given sphere with no necessary instant submission to presented issues.
3. Futuristic research is related with the organized research work of probable future circumstances.
4. Descriptive research: The descriptive research is basically fact finding research and survey research and the major aims of this research is to provide the explanation of the state of affairs and This research also tries to answers to the questions like what, who how and sometimes when.
5. Explanatory research: The explanatory research is to explain the factors for the happening and this research uses theories or hypotheses at least.
6. .Analytical research: In this research, the researcher is generally using data and information which is previously obtainable, making a critical assessment.
7. Quantitative research: In terms of quantity measurement, the Quantitative research is applicable to the phenomenon.
8. Qualitative research: The aim of this research is to find out the original purposes as well as needs, with utilizing in deepness interviews for the idea and this research is connected with the qualitative phenomenon.
9. Predictive research: With explanation, this research is just as fixed and it calls for a high order of implication creation.
10. Conceptual research: To promote new theory or concepts ,this research is generally utilized by the thinkers and philosophers.
11. Empirical research: This research is suitable while evidence is required that in some way assures variables influence over other variables (Kothari, 1985).



Flow Chart of Research Process



Flow chart 3: Research Process

However, the various social scientist has tried to specify the stages concerned in research. Process which are largely consisting of the below mentioned stages: Formulation of problem, Growth of an approach to the problem, Research Design, Selection of Data collection method, Methods of Sampling, Data Collection, Interpretation and analysis and Report preparation and presentation etc.

III. INFORMATION AND COMMUNICATION TECHNOLOGY IN RESEARCH

In the activities of research in higher education the uses of ICTs are chiefly influential as well as undisputed. With the growth of ICT, it makes probable for research teams to be extent through the universe. In many developing and developed Countries for last 15 years, the uses of Information and Communication Technology in social science research has grown progressively. However, the direct use of ICT in social science research is in data processing as well as in technology and telecommunications networks, with the advanced ICT, that is utilize of online research libraries or online full text data base in research and which are the straight consequence of the development (Rani, 2018).

Information Sharing Through ICT:

Through the advancement of ICT, the researchers can access the updated research papers which are made available in the different websites. Internet based collaboration and sharing of information have created global collaboration on scientific tasks possible. In every discipline the computers are helping towards empirical research with different types of analytical software programs. It is problematic to consider nowadays a scientific research plan without computer and as a result it is an essential and extensive instrument in social science research. Without the application of computer, several research work are not able to be carried out properly, chiefly those connecting data examination, statistical work and calculations. The different phases of research from proposal to submission of outcomes, the computer is used in a large scale in the social science research (FUNG, 2013)

Advantages for Teachers and Researchers:

- The Information and Communication Technology mainly the internet contributes educator's contact to a extensive series of data, media types as well as historical sources.
- To recognize errors in the historical thinking of students, and permitting faculties through CMC by having online discussion on those issues.
- Through the use of Information and Communication Technology, the researchers will be able to present the

historical materials as per the needs of individuals and researchers (CHAMANLAL, 2014).

Effectiveness of Information and Communication Technology in research

- The researchers can improve their learning skill because of Information and Communication Technology.
- The Information and Communication Technology offer huge information to the researchers through web source or Internet.
- The researchers also be benefitted for further learning due to use of digital Projectors.
- The Information and Communication Technology can provide a platform for the researchers to improve the research and academic efficiency at the national, regional as well as local level.

Practice of Information and Communication Technology:

- Practice of newest machinery of Information and Communication Technology in the colleges and Universities.
- In research course work, the educator and Ph.d guide can utilize software device, but not the old methods like Black or White board.
- The researchers in social science will be able to use the new sources of internet for completing their term papers, projects or assignments in their research coursework and after completing their research programmes (Meenakshi, 2013)..

Knowledge of ICT:

- Information and Communication Technology in Social science research offers data and information to work in diverse strategies.
- Information and Communication Technology in Social science research assists to create the creative information to the researchers in their related literatures.

Research sectors and utilize of ICT:

- The ICT in social science research can be utilized to improve academic design of research.
- The researchers bring well results in social science research and promote the information skills of the researchers due to Information Technology.

IV. RESULT AND DISCUSSION

The Information and Communication Technology had outcome on many parts of social science research. The table is given below to show the details

Table no: 1 Useful of ICT in Social Science Research

Effects of ICT	In Social Science Research
Use of ICT in pre-data investigation	Article Availability
	Dissertation and Thesis Availability
	Search on Literature
	Search on Content
	Tracking on literature
	Quantitative data collection
	Qualitative data collection
Use of ICT in data analysis	Quantitative data analysis
	Qualitative data analysis
Use of ICT in post-data study	References and Bibliography Compilation
	Article and Thesis / Dissertation’s discussion
	Plagiarism Detection
	Journal Manuscripts Submission

The impact of ICT in Social Science research can be classified into three categories namely - Use of ICT in pre-data analysis, use of ICT in data analysis, and use of ICT in post-data analysis. Before coming to the stage of data analysis, use of Information and Communication Technology in pre-data analysis provides patterns how Information and Communication Technology are useful on the areas of social science research . However, the effectiveness of Information and Communication Technology in pre-data analysis includes:

- Article Availability
- Dissertation and Thesis Availability
- Search on Literature
- Search on Content
- Tracking on Literature
- Quantitative Data Collection
- Qualitative Data Collection
- Vast Data as well as Its Analysis

Usefulness of ICT in Pre-data Analysis

Article Availability

It is observed that research articles in research journals were very common in hard copy before introducing the web source and on the other hand softcopy of selected journals are very rare. However, the online journals are easily accessible and available in contemporary social science research. In fact, through Internet technology it is made possible in which after those research papers or articles were being digitized as well as uploaded into proper repositories, by the secured or open internet access the social science researchers be able to simply as well as speedily contact to those research articles of social science journals. However, the modern Internet technology is able to reduce preventable printing and protect the greener atmosphere.

Dissertation and Thesis Availability

It is seen that at the initial stage ,a good number of the hardcopy of dissertations and thesis were limited within university or other academic libraries in which the social science researchers required to visit from one academic

library to other university to get contact to their related literature. But currently, due to proper technology many dissertations and thesis are available either online or softcopy and can be accessible from Internet or University intranet or shodhganga.inflibnet.ac.in and it makes the social science researchers enables to easily simply and quickly access the related thesis and dissertations for their research. Infact the researchers also print the related thesis or dissertations as related literature for conducting and theorizing the framework of their research.

Search on Literature

It is observed that previously the social science researchers were compelled to search the hardcopy of literature manually and accordingly it took long time to perform their manual search and outcomes were also limited. But in contemporary research world the researchers uses internet search engines. On the contrary, a lot of research materials, literature and artifacts today can be searched using Internet search engine like Google Scholar,Google,www.academia.edu websites of different universities as well as different libraries, domestic search engines to access the related literature and research materials and these facilities is available for 24 hours and it has contributed to this productivity and possibility .

Search on Content

Until that time while the related literature were available in hardcopies, then also the researchers desires to complete manual seek on definite vital lines or paragraph by analyzing line by line of the related literature. But the researchers in present research based world can uses the soft copies literature search and find content, search to investigate for particular vital lines or phases in which this is productive and more effective. To calculate the regularity of certain vital words or lines appeared in an interviewed more efficiently the content search also assists qualitative researcher.

Tracking on Literature

Previously, the social science researchers have to classify, sort out as well as stock entirely their related literature and objects that they had studied



into physical files or place holders and computer folders . The Researchers also required to make their individual tracking machinery namely in spreadsheet planor word document to track as well as achieve their studied literature accordingly that in future they can re-utilize or denote to. However, in the availability of new technology the researchers are presently utilizing the software such as Mendeley that be able to help share, manage as well as discover the literature contents as well as contacts that they had studied. Utilizing of software i.e. Mendeley to track a literature of researchers is saving period as well as strength and proficient to achieve lots of related literature.

Quantitative Data Collection

In the context of previously quantitative research, from email survey and hardcopy the datas were collected in which to every the intended respondents the survey questionnaires were circulated. However, currently, the data can be collected through web –based, online and internet namely www.surveymonkey.com or www.google.com.

Qualitative Data Collection

Formerly, the data was collected by the qualitative investigators in voice format have to record into text physically, namely show as well as repeat the audio recorder, attend as well as write down the key aspects in what was caught into the text. However, the qualitative research of today through the voice acceptance software i.e. Dragon Naturally Speaking (www.nuance.com/dragon) is able to practice and mechanically translate voice into text.

Vast Data as well as Its Analytics

Previous to the big data period, the dataset was not inter-mixed used for the aims of research and from unstructured or semi-structured data the structured data was distinctly separated. However, in qualitative research, the unstructured or semi structured data is utilized whereas the Structured data is applied in quantitative research .In the big data era ,big data analytics are utilized to practice the big data as well as it can be send by cloud computing or on the other hand with a pool of network resources. However, big data analytics has various parts like data stores, HDFS, Mapper as well as Reducer, NOSQL, Content repositories etc. In social science research the productivity created by big data analytics is able to utilize for data examination and research procedure.

Uses of ICT in Data Analysis

- **Quantitative Data Analysis** – For conducting quantitative research among the researchers, ANOVA, the common data analysis techniques i.e. exploratory factor analysis, , t-test as well as multiple regression were utilized among the researchers During that time, In that situations ,some techniques such as statistical software were not simply available. However, in that time, before the researchers were permitted to exercise the statistical software, the researchers have to learn as well as know the statistical formula. With the advancement of ICT, the techniques of data analysis like SEM,path study, hierarchical regression examination and hierarchical linear model are geting recognition and the SPSS are more used and advanced in social science research with its new functionalities.Presently, the researchers are able to utilize statistical software more friendly and be able to treat as black box with mainly concentrate on analysis of outcome

generated. The modern technology such as statistical software makes possible the researchers to perform more complex as well higher quality research.

- **Qualitative Data Analysis** – Previously it is seen that the researchers needs to perform qualitative data analysis manually and utilizing computer database to present basic sorting, searching, highlighting and sorting and due to lack of software to assist researchers in presenting qualitative data study. However, in conditions of text analysis and interpretation, coding, recursive abstraction, the social science researchers are getting reputation through the utilization of CAQDAS in which SPSS Text Analytics, MAXQDA and ATLASTI are being used to sustain qualitative research. From video or Audio to the text and to execute the essential abstraction and encoding prior to touching on to the next phase of the research ,the accessibility as well as exercise of CAQDAS significantly develop efficiency and accurateness of a social science researcher in conditions of recording

Uses of ICT in Post-data Analysis

- **References and Bibliography Compilation** – It is observed that previously the researchers in social science research have a tendency to bring together bibliography and references manually. However, the social science researchers accurately typing in to construct the complete part of the bibliography or references and in ascending order tracked by sorting them. But presently the researchers in Social science research are using reference management software and uses citation like www.endnote.com,www.zotero.org to select citations as well as settle bibliography or the references mechanically.

Discussion on Research Article and Dissertation or Thesis

It is observed that there is required for communications and discussions among supervisors, researchers in the course of generating article, dissertation and thesis and during the viva voice. However, in this progressed Information and Communication period, the means such as Yahoo, Skype, Face book, Lync, Whatts up are being used for valuable communication. With this connection, some software platforms or web sources be able to used such as Research Gate, Academia.edu to assist distribution of research resources and to assist suitable contact as well as information sharing in effective form which can save traveling time as well as cost. Moreover, utilizing Research Gate and Academia.edu be able to quicker the knowledge curve and gain the smallest amount charge of learning with solving a researcher’s doubts by a great group of expertise .

- **Plagiarism Detection** – Earlier, the academic authority and the universities were dependent on readers to recognize them manually because the plagiarism act was slow as well as rigid to identify. However, with the help of Information and Communication Technology the plagiarism software like Dupli Checker, Plagiarism Checker, and Article Checker can be used to detect the plagiarized contents. Accordingly, the



modern technology such as plagiarism checkers is utilized to check plagiarism quickly as well as successfully.

- **Journal Manuscripts Submission** – Previously the journal manuscripts are submitted through email communications between authors and editors of journals. However, currently electronic manuscript submission or management systems and peer-review software, such as Elsevier, Wiley, Sage Publications are usually utilized between the public of researchers as well as journals / publishers. And utilizing such mechanisms is be able to reduce the time of submission as well as checking the position of publishing. Likewise, utilizing such structures significantly help the output as well as value of effort to administer and the submission and the peer-review administration in which delay or loss of communication and miscommunication can be reduced.

Role of Internet technology and improved Research Skills

With the role of ICT, the researchers in Social science research be able to find out the thousands of articles available in online and makes the researchers modernized in their research expertise.

- **Google Scholar**

It is the world's largest database of abstracts of the research articles as well as peer-reviewed literature. The Google Scholar can save the pain of manually typing of bibliography. To put appropriately in any format the researchers wants their bibliography or literature, have just to click and accordingly the researchers will be able to decide and select the format like APA, MLA as well as Chicago Manual of method for their research work.

- **Directory of Open Access Journals (DOAJ)**

It is seen that in the directory the set of scientific research based articles, shows partially being measured up to Google Scholar and however, DOAJ presents full research article at free of cost.

- **Philippine E-Journals**

This facility permits the Filipino researchers to distribute their findings with the earth and it is an increasing compilation of educational journals. With this sites the researchers are able to get a concept on the contributions of researchers in the different regions of the world and it also promotes regional researchers by the context-relevant data.

Information and Communication Technology; Benefits and Constraints

- To discover as well as escape the copyright violations and drawbacks of plagiarism, the ICT helps the researchers to manage their research work. The ICT in social science research promotes the quantity and quality of research work. On the other hand, it is observed that the ICT is criticized due to the great charge of installing, operating, sustain and replacing of ICT and great cost of acquiring also.

- The major issues of ICT in teaching and research are:

- i) Connecting learning machinery without studying availability of contents as well as needs of researchers and students.
- (ii) Commanding technical structures from top to bottom without connecting researchers and educators.
- (iii) Without modifying it suitability, uses unsuitable content from additional areas of the globe.
- (iv) Creation of low value content.

- Another constraints is that the basic needs of telephone network and electricity is not properly available in many developing countries and many institutes does not have suitable rooms and houses to accommodate the advanced machinery.

- The major constraints in Social science research is that all the research supervisor are not fully sound for using the advanced ICT and they need to improve their own capacity to make sure the efficient use of ICT in various research and academic environment. In many underdevelopment countries, the researchers are not fully sound with English language and the ICT is mainly used through the English language as a medium of instruction and therefore, many researchers don't feel comfortable with the ICT due to language factor.

ICT and Obstacles of Social Science Research

- The researchers who are not the familiar with ICT tools have are required high learning curve. And many old researchers are not fully familiar with the advanced Information and Communication Technology due to using traditional tools of research in social sciences.

- Preparing Thesis in a smaller time-frame and there the research institutions and universities might review the aims set for the investigators.

- It is observed that excessive use of Information and Communication Technology has reduced the social skills of the social science researchers because they are interacted with the advanced ICT tools largel and as an outcome social attachment is lacking.

- Although the plagiarism software has been introduced in research area, but all plagiarism software are not fully authentic and reliable. It is very difficult to detect the plagiarized contents of literal translation.

- Although all research articles are available online, the new researcher can read different similar articles in which he or she has interest and has lots of possibilities to take similar topic for their further study.

- Although with the help of ICT, now every research is formed in a constructive way, but the contemporary research work is not fully free from the plagiarized contents.

V. CONCLUSION

The use of Information and Communication Technology in the research area has an important role as it provides better quality and increase quantity in research, helps in the achievement of enhance speed, limited complexity, lower the cost of research and also an essential enabler to enhance the output of a researcher in social science research. However, the research duration can be reduced with the use of Information and Communication Technology and through the proper utilization of ICT, the researcher can increase the knowledge contribution in the social science research within the research community. Utilizing Information and Communication Technology -based apparatus also helps to decrease the complexity of research as demonstrated in the handling of complex theoretical frameworks and removing difficulty in big datasets that come into features such as larger variety, bigger volume, top



speed and lower authenticity. It is observed that with the use of Information and Communication Technology -based tools, the cost of research decreases because less hours are necessary as efficiency in researchers gets improved. However, the new ICT tools in social science research are functional, which makes the search method more easier as well as quicker with great reliability and truthfulness. Thus the ICT tools such as computers that are contributing vehemently towards the social science research, constructing innovative patterns as well as offering original insights has revolutionized the domain of research and has created new opportunities and facilities for the researcher.

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