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ROLE OF ICT IN RESEARCH

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INTRODUCTION

Adoption of Information and Communication Technologies in teaching, learning and research has come a long way and so is the use of various web2.0 tools. The researchers need to change with changing times and need to understand today's fast changing knowledge base and its peculiarities. The article is written with an objective of finding out how is the academic researcher changed, helped, or hindered, by the use of ICTs in general and web2.0 tools in specific. ICT tools are mainly used by researchers for its ability to ease knowledge-gathering process and to enhance resource-development. Researcher in general value creativity and originality, thus the ICT tools which provide with the most open situations with great autonomy to the researcher can really help in identifying and solving research problems in the most creative ways. Some of web2.0 tools used for research related tasks are dealt in detail here to give a clear guidance to the researcher. The use of ICT is based on the individual's logical assessment of how various applications increase his/her effectiveness and efficiency in work and provide ease in communication with peers.

Use of ICT tools for making research data and information available are plenty in numbers today, but the best use of ICT tools would be to improve cognitive skills and thus help discriminate, analyse and create information rather than simply accumulate (Boyer Commission, 1996). As usually research process deals with large amount of complex information and requires a lot of skills to analyse and organize these well, any ICT tool which helps the researcher give meaning and precision along with adding value to the information generated would be rated above the ones which help in just gathering information.

Generally, ICT tools help researcher in the following research related tasks

- identify appropriate information sources
- critically analyses information
- research effectively
- manage information
- use information to extend and communicate knowledge across subject fields

- search up to ten databases and electronic resources simultaneously
- receive results in a common format
- link to individual databases for more specialised searching
- select favourite resources and e-journals, save searches and records, and setup email alerts.

The possibilities of conducting research with Internet and its virtual components by individuals and organizations are innumerable. While going thru the research papers among others, several authors have mentioned that ICTs support: instantaneous information exchange despite geographical distances, costless accumulation of data and documents, improvements in the precision of knowledge reproduction, innovative and more effective routines to design new products and conduct problem solving activities both at individual and organizational level.

Now, let's look at the main steps that are usually taken to conduct research. The first two steps in any research activity are 1. Identifying your own world view and situate your research for evaluation. 2. Problem Identification by Literature review and design of research questions

Research starts with an idea that researcher has, and now to conduct research, that idea needs to be converted into a proper research question. ICT has to come in first stage while the researcher needs to discuss the ideas with others to get better user involvement.

Now let's consider some ways in which ICT tools can be used to find Research Topics and create bookmarks for later references.

Search Engines A feature of the Web that enhances learning and research is the use of search engines. A search on the Web can be very effective in providing a context for an unknown quote or theory, in a timely manner. The use of search engines can save precious time in research.

Research indicates that about 85% of Internet users use basic search engines and search services like google to find specific information. However, it is also found that users are not satisfied with the performance of the current generation of search engines for not giving focused results by way of providing articles and notes from personal blogs etc. along with quality research articles. so ordinary search engines are helpful for researching business and popular culture, but they're not very useful for finding academic research papers or scholarly journal articles. Journal articles are available in a variety of formats, ranging from citations or brief abstracts to full text delivered electronically or in hard copy. Some articles are provided free. Often, a fee is required, or access is restricted in some way. Searching the invisible web resources also can be very useful.

The following are some of the useful search engines used for research activities, 1. www.ask.com -lists related searches ,2. www.base-search.net: a multi-disciplinary search engine for academically relevant web , 3. Bing – Microsoft's search engine lists related searches , 4. Google Scholar – indexes scholarly research from many journals, books, papers, etc. across many disciplines ,and 5. Yahoo! Search – originally a Web directory, it now features a reliable search engine.

Metasearch engines allow to query various search engines simultaneously providing a single list of results. These can avoid duplication and provide additional ideas. Some of the very useful and popular metasearch engines are Clusty (Vivisimo), Dogpile, Ixquick and Mamma.com.

Subject Directories allow to browse Web pages by category, and are best used when there is a need to find a list of “general” Web sites pertaining to a topic. These are often compiled by human editors and provide annotated links pointing to reliable Web sites. Apart from the google and Yahoo Directory these are a few others worth consideration is the open directory www.dmoz.org and www.opendoar.org/search.php.

Subject-specific search engines tend to focus solely on a topic and allow to narrow results and ensure that these are relevant. Many subject specific resources can be found listed by various University Library departments in the Library Research Guides. The following tools represent only a sampling Pinakes – A Subject Launchpad, Infomine ,Scirus , Hakia, Education World and Business.com .

Social Bookmarking is tagging a website and saving it for later. Instead of saving them to web browser, we are saving them to the web. Having started out as a way to store browser bookmarks online so that they can be utilized on different computers and shared, social bookmarking has grown to such an extent that it can now be used to search the web instead of relying on traditional search engines. In fact, social bookmarking sites are being used as intelligent search engines. Most social bookmarking sites allow to browse through the items based on most popular, recently added, or belonging to a certain category like technology, politics, blogging, news, sports, etc. Examples of Social Bookmarking sites are Del.icio.us, Magnolia, Blinklist, esnips etc.

Social News, another feature of web 2.0 is websites like Digg, Reddit and Propeller focus on social bookmarking of news-related items such as politics, sports, technology, etc. Social news sites are different from standard social bookmarking sites by focusing on specific articles and blog posts rather than websites. Because of this, they can be a great source of news, and they also offer the ability to participate in the discussion by leaving comments on popular news items.

Evaluating and citing Web sites There are some words of caution while gathering information from web: 1. all types of information are not available on the Web, and especially not for free. 2. unlike traditional published sources, Web documents have not necessarily been evaluated hence the need to assess the quality of the documents is very crucial for a researcher.

Information on the Web can originate from many different sources including individuals, organizations, governments, academic institutions and companies. It is therefore important to quickly assess the reliability of the sources found. The major points of check when evaluating a Web site are: Currency, Authority , Purpose and Point of view .

DESIGN THE STUDY AND DEVELOP YOUR METHOD(S)

In this phase of research there has to be active Participant Involvement. The researchers has to have proper Survey Design, correct Sampling and have to sort out all Statistical issues for conducting Qualitative/Quantitative Research.

In the following three ways ICT Tools can be used by researchers for qualitative research

As a medium of communication ICT tools provide powerful communication channels mostly text based but increasingly enhanced with moving and still images and sound, thus competing fairly with the traditional medium of interaction. Researchers can log into any of these channels and practices, either for studying the way people use computer mediated communication in cultural context or can utilize these to interact with participants by initiating a discussion.

As a network of computers -Internet, the most popular and powerful ICT tool, breaks all boundaries and makes physical distances between people disappear thus providing a platform like online communities, blogs and discussions forums to reach out to people all across the globe for collective and collaborative research with seamless possibilities for the researcher to utilize this space particularly for collecting information.

As a context of social construction, the web2.0 facilitates the researchers to witness and analyses the structure of conversation by either participating or simply observing, the social structures that emerge. This gives a good insight to the researcher while gathering data and then during analysis, how language builds and structures social reality.

Regardless of the use of any of the above said framework that is used, qualitative research can be conducted by utilizing Internet based other web2.0 tools for research on any social phenomenon at the same time qualitative research can conducted on any of the web2.0 tools as a specific social phenomenon as well.

COLLECT AND COLLATE THE DATA

Data collection requires Collaboration. A word of caution to the researcher is to take care of Intellectual property related issues in advance before using Internet and web2.0 tools for data collection and storage. The qualitative research process starts with a Questionnaire / Survey Design. Survey can be created using ICT tools Web, Word Processors (WP), Spreadsheets and now most popular online tools like google-forms and surveymonkey.com, and can be distributed using email and discussion boards.

The data collected using one or many such online tools need a proper Database structure for storage and retrieval thus tools like relational databases (SQL Server, ORACLE etc.); open sources databases using MySQL and Access, Flatfile database using Spreadsheet, wikis, GIS [Google earth, Google Maps, Flickr, Arcview/explorer]) can be used.

Data Analysis is an area where a lot of works is being done and a huge collection of open-source tools are available for researcher e.g., for Relationship mapping techniques like Herring or fish bone mind maps, SWOT Analysis, PMI, Venn etc. software like Inspiration, kidspiration, smart ideas, Cmap, Mindmapper, freemind would be useful and also the opensource Online tools available at www.glify.com/, www.mindmeister.com, www.drawanywhere.com/. An open-source statistical software programming language like R is found very useful by researcher. For preparing Graph using Spreadsheet, digitizer, for typical data analysis using Calc or excel, preparing Checklist (any Word Processor, Spreadsheet) and Mashing tools like intel mash up is now very common.

ICT IN QUALITATIVE DATA ANALYSIS

The applicability of ICT based analytical tools in qualitative research is debated as it is argued, that the original meaning inherent in the data could be distorted or lost in the process of data analysis. Thus, the employment of computer programs in qualitative data analysis is a practice that should be viewed with caution. Analyzing qualitative material that is based on speech or texts derived from interviews and conversations must have regard for the context and the integrated whole. Computer based systems to aid with analysis are, often based on the natural scientific view of the world that sees social phenomena as reflections of the higher-level ordering of an objective social structure. The ideal data type here is one which is amenable to quantifying and segmentation into discrete categories as this allows for numerical manipulation and analysis. Researchers who make use of these packages must remain alert to the need to preserve the integrity and context of the original material and not lose sight of this during the process of coding and subsequent analysis.

REPORTING AND DISSEMINATION

The final step in the process of any research activity is Writing up Research by Research Reporting Guidelines advised using the word processors.

Disseminating Research: To make the research outcomes reach maximum numbers of stake holders proper planning for printing, mailing and/or posting on community forums plus translation is required. Making research results accessible to various audiences through website, Research Portfolio, Newsletter, and other Community reports is now a common practice. Presenting research at Conferences/ Seminars and thus making findings known to users should be planned. Events happening across the globe on the theme of research can be found out easily today through Internet.

Bibliography: Web pages, as with journal articles, books, encyclopedias and other material consulted while researching, need to be properly cited in a bibliography, a reference list or a list of works cited. There are a lot of Citation & Style Guides online which provide more information on citation.

Thus, there are some innovative tools available today that support researchers in the entire research process i.e., researcher can get help to Search intelligently, assess the quality of search results, help in recording, organizing and producing information using online notecards, and also help in formatting the bibliography in MLA, APA, or Chicago/Turabian whichever style that is required.

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