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Digital Black Hole and Electronic Waste: Twin Fears of Digital Age

Sibsankar Jana

Abstract:

This discusses the concept of digital black hole, citing the similarity between a digitization project and life cycle of the star. Electronic waste is an alarming ingredient of environmental pollution. The present study is an effort to discuss the elements and sources of electronic waste. Some measures are also enlisted to overcome this alarming situation.

Keywords: Electronic Waste; E-hazards; Digital Black Hole.

Introduction

Growth of information and Communication Technology sector has enhanced the usage of electronic equipment exponentially. To avoid Digital Black Hole, where all the digital information is lost forever, we need to upgrade technology. Again, faster obsolescence and subsequent upgradation of electronic products are forcing consumers to discard old products, which in turn accumulate huge e-waste to the solid waste stream. The situation demands a long-term planning; otherwise on one hand, Digital Black Holes will eat all necessary digital information and on the other hand, our earth will be the garbage of harmful E-waste.

Digital Black Hole

The inherent attribute of the digital information is to use technology rather than naked eyes to access and retrieve information. Some factors are always associated with digitization and archival project to keep information accessible. These are: upgradation of hardware in accordance with the upgraded and new software; preservation of digital information to be accessed; recurring cost and the shifting of objective and respective priority areas. If any factor starts to fade, the information may still be retrieved, but after a while it will no longer be accessible due to improper storage media, corrupted files, or obsolete file formats or technology. Then, the digital information is lost forever in the black hole.

Life Cycle of the Digitization Project Compared to the Life Cycle of a Star

Life cycle of the digitization project is very much similar to the life cycle of a star. In the beginning, digital projects may seem easy to plan and fun to conceive. But long-term costs for keeping the digital files alive are really beyond our imagination and hard to calculate at initial stage. Without any long-term planning, digitization projects can come to behave like black holes in the sky. Scanned and or hard copy of digital information, which in the analog world could be accessed using our naked eyes, is suddenly stored in an electronic environment where it is only retrievable through the use of ICT, which constitutes a constant cost factor. More the digital information is created and / or converted, the more the cost for accessing it. In addition, in due time the project may be discarded and the information may be finished in a digital black hole forever.

The life cycle of digital information or digitization project is akin to the life cycle of a star. The life cycle of a star is shown in the Fig

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Fig 1: The Life Cycle of Massive Stars (Adapted from Ref. 6).

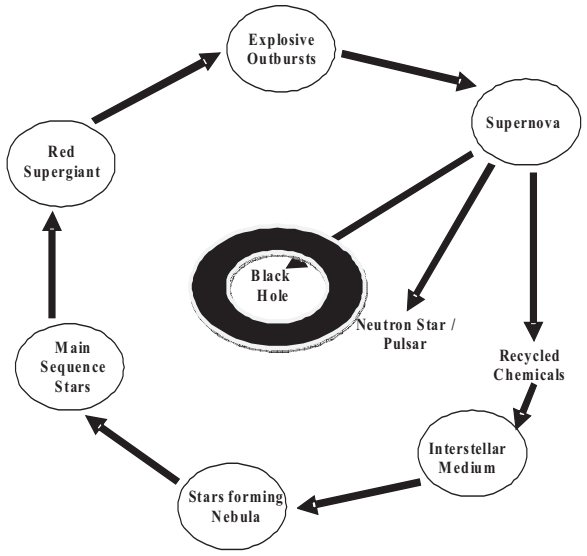
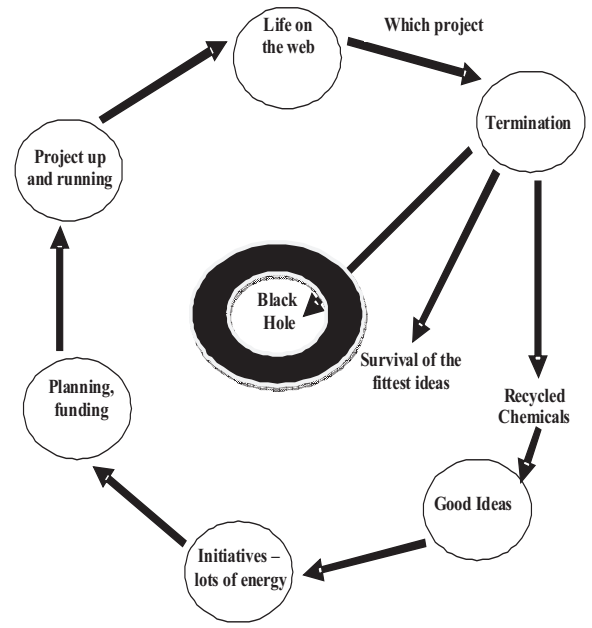


Fig 2: The Life Cycle of Digitization Projects (Adapted from Ref. 6).



1, where every step is very much similar to the life cycle of digitization project shown in Fig 2.

Good ideas in the information world carry similar to the interstellar medium in physical world. In case of digitization project there is a lot of energy in the initial stages. Therefore, the next phase of planning and securing project funding carries on as usual. Digitization is started. Gradually, all the information is digitized and organized. Then it requires long-term preservation and storage for further use. In addition, side-by-side new projects begin to develop, other interests get in the way, and the project begins to be neglected, starts to collapse, and ultimately ends in the black hole. All efforts and money is wasted in this way. Some strong ideas may survive and give rise to a new project. It is really a fear of the digital age.

Electronic Waste

Electronic Waste (E-Waste) comprises of waste electronic goods, which are not fit for their originally intended use and have been discarded by their original users. It consists of household appliances such as refrigerator, air conditioner, cellular phone, personal stereos and consumer electronics to computers. While there is no generally accepted definition of electronic waste, in most cases electronic waste consists of electronic products initially used for data processing, telecommunications, or entertainment in private households and businesses that are later considered obsolete, broken, or unrepairable. E-waste is growing in India at the rate of 10%. (Author please mention year?)

Sources and Chemical Elements of Electronic Waste

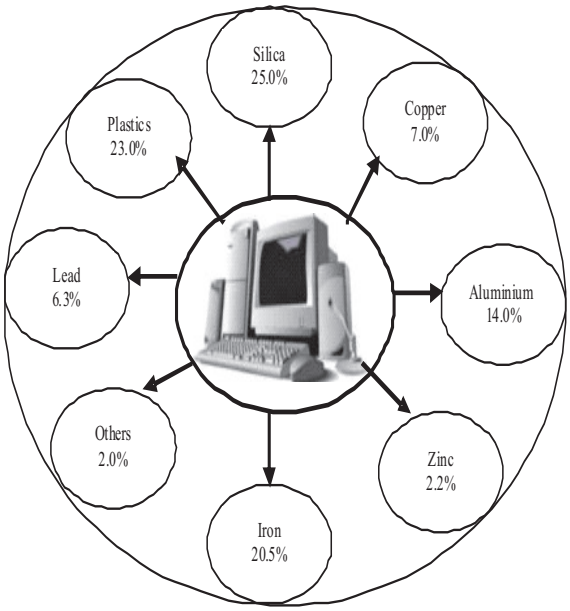
Electronic waste is the most rapidly growing waste problem in the world. Modern civilization is full of electrical, electronic and digital gadgets. These modern gadgets produce e-waste directly or indirectly. The main sources of e-waste are listed below:

- Import

Chemical elements in electronic waste are varied in nature. The chemical elements in the computer are shown with the help of pie diagram (Fig 3).

Heavy metals: lead, zinc, chromium, cadmium, mercury, copper

Fig 3: Chemical elements in the computer



Trace elements: germanium, gallium, barium, nickel, tantalum, indium, vanadium, terbium, beryllium, gold, europium, titanium, ruthenium, cobalt, palladium, manganese, silver, antimony, bismuth, selenium, niobium, yttrium, rhodium, platinum, arsenic, lithium, boron

Other: silicon, carbon, iron, aluminium, tin, copper

Problems Associated with E-Waste

E-waste contains several different substances and chemicals, many of which are toxic and are likely to create adverse impact on environment and health, if not handled properly. However, classification of E-waste as hazardous or otherwise shall depend upon the extent of presence of hazardous constituents in it.

- Computer or television displays (CRTs) contain an average of 6 pounds of lead each.
- When these components are illegally disposed and crushed in landfills, the lead is released into the environment.
- Lead can cause damage to the central and peripheral nervous systems, blood system and kidneys in humans.
- Improper collection system.
- Imports regularly coming to the recycling markets.
- Inhuman working conditions for recycling the products.
- Lead accumulates in the environment and has highly acute and chronic toxic effects on plants, animals and microorganisms.
- Other hazardous materials used in computers and other electronic devices include cadmium, mercury, hexavalent chromium, PVC plastic and brominated flame retardant.
- The presence of these chemicals also makes waste collection particularly hazardous to workers.
- E-waste is the most rapidly growing waste problem in the world.
- It is a crisis of not quantity but also a crisis born from toxics ingredients, posing a threat to the occupational health as well as the environment.
- Rapid technology change, low initial cost, high obsolescence rate of both hardware and software have resulted in a fast growing problem around the globe.
- Unavailability of rigid legal framework.

Environment and health hazards

Cathode Ray Tubes (CRTs)

i) Process: Breaking and removal of copper yoke and dumping

ii) Potential Occupational Hazards:

- Silicosis
- Cuts from CRT glass in case of implosion
- Inhalation or contact with phosphor-containing cadmium or other metals

iii) Potential Environmental Hazards: Lead, barium and other heavy metals leaching into ground water, release of toxic phosphor

Printed Circuit Boards (PCB)

i) Process: Desoldering and removing computer chips

ii) Potential Occupational Hazards:

- Tin and lead inhalation
- Possible brominated dioxin, beryllium, cadmium, and mercury inhalation

iii) Potential Environmental Hazards: Air emission of same substances

Dismantled Printed Circuit Board Processing

i) Process: Open burning of waste boards that have had chips removed to remove final metals

ii) Potential Occupational Hazards:

- Toxicity to workers and nearby residents from tin, lead, brominated dioxin, beryllium, cadmium and mercury inhalation
- Respiratory irritation

iii) Potential Environmental Hazards: Tin and lead contamination of immediate environment including surface and ground waters. Brominated dioxin, beryllium, cadmium and mercury emissions

Chips and Other Gold Plated Components

i) Process: Chemical stripping using nitric and hydrochloric acid along riverbanks

ii) Potential Occupational Hazards:

- Acid contact with eyes, skin may result in permanent injury.
- Inhalation of mists and fumes of acids, chlorine and sulphur dioxide gases can cause respiratory irritation to severe effects including pulmonary edema, circulatory failure and death

iii) Potential Environmental Hazards:

- Hydrocarbons, heavy metals, brominated substances, etc., discharged directly into river and banks.
- Acidifies river destroying fish and flora.

Plastics From Computer And Peripherals (E.G. Printers Keyboards, Etc.)

i) Process: Shredding and low temperature melting to be reutilized in poor grade plastics

ii) Potential Occupational Hazards: Probable hydrocarbon, brominated dioxin and heavy metal exposure.

iii) Potential Environmental Hazards: Emissions of brominated dioxins and heavy metals and hydrocarbons

Computer Wires

i) Process: Open burning to recover copper

ii) Potential Occupational Hazards: Brominated and chlorinated dioxin, polycycline aromatic hydrocarbons (PAH) (carcinogenic) exposure to workers living in the burning works area.

iii) Potential Environmental Hazards: Hydrocarbon ashes including PAHs discharged into air, water and soil.

Miscellaneous Computer Parts Encased In Rubber Or Plastic E.G. Steel Rollers

i) Process: Open burning to recover steel and other metals

ii) Potential Occupational Hazards: Hydrocarbon including PAHs and potential dioxin exposure

iii) Potential Environmental Hazards: Hydrocarbon ashes including PAHs discharged to air, water and soil.

Toner Cartridges

i) Process: Use of paintbrushes to recover toner without any protection

ii) Potential Occupational Hazards:

- Respiratory tract irritation
- Carbon black, possible human carcinogen
- Cyan, yellow and magenta toners, unknown toxicity

iii) Potential Environmental Hazards: Cyan, yellow and magenta toners, unknown toxicity

Secondary Steel Or Copper And Precious Metal Smelting

i) Process: Furnace recovers steel or copper from waste including organics

ii) Potential Occupational Hazards: Exposure to dioxins and heavy metals

iii) Potential Environmental Hazards: Emission of dioxins and heavy metals.

How to Overcome the Situation

Source reduction

It is expected that manufacturers of electronic goods, who have benefited from sales of their products, should take responsibility from production through to the end of their lives. To prevent an e-waste crisis, manufacturers must design clean electronics with longer lifespan that are safe and easy to recycle and will not expose workers and the environment to hazardous chemicals. Side by side, consumers must have adequate knowledge about use, reuse, donation and recycling of the products. In both the cases reduction of sources is the vital issue. Source reduction is the least expensive and most effective way to manage e-waste.

Reuse: Schools, non-profit organizations, and lower income families can benefit from your equipment if it is in good working order.

Donation: Many charitable organizations and training programs repair equipment for reuse

Recycling: A growing number of electronics manufacturers offer fee-based recycling services. Also, some municipalities offer electronic collection as part of household hazardous waste collections or special events.

Buying Green Products: Many products are being made with fewer toxins and more recycled content, are more energy efficient, are designed for easy upgrade or disassembly and use less packaging. Some companies offer lease and take-back options to help you properly dispose of your electronics.

i) Clean up: Electronics manufacturers must stop using hazardous materials. In many cases, safer alternatives currently exist.

ii) Take back: The taxpayer should not bear the cost of recycling old electrical goods. Manufacturers should take full life cycle responsibility for their products and once they reach the end of their useful life, take their goods back for re-use, safe recycling or disposal.

iii) What we can do:

- Support companies that make clean products. If you are buying a product check the Guide to Green Electronics.
- Think twice before buying whether you really need a new device.
- Return your equipment to the manufacturer when you have finished with it.

Collection Events

E-waste collection events are very similar to HHW collection events, in that they can be sponsored by private corporations, communities, or by local government. They are beneficial because they reduce the amount of hazardous materials going to the landfill, which in turn reduces the threat to humans and the environment. Collection events create jobs and allow refurbished electronics to be available at reduced prices to the general public.

Items Usually Accepted in Collection Events

- Working / useable equipment;
- Repairable or upgradeable equipment;
- Non-usable equipment with salvageable components; and
- Equipment and components, some hazardous, that must be either recycled or disposed of according to applicable regulations.

Conclusion

Proper planning is needed before going through a digitization project, because, most of the project, due to the shortage of money and shifting of objective, may be terminated and finally be finished into the digital black hole. Again, proper planning and sufficient

fund may help the project to survive, but it requires regular updating of hardware, which indirectly increases the electronic waste. We are not referring to the right to vote or right to free speech, but rather the right to avoid environmental harm regardless of race, age, economic status or geographical location. In addition, while "environmental harm" is rarely a description attached to a television set or a computer monitor, it is fast becoming a known fact that violations run rampant in the world of electronic waste recycling. Currently, up to 80% of the electronic waste meant for recycling is quietly exported to countries where products such as computers, radios, and television sets are dismantled in a crude fashion that causes severe environmental and public health risks.

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Institutional Repository Initiatives at Higher Education and Research Organizations in Karnataka, India

Sujatha H.R*, Bharathi H**

Abstract

This is an age of Information explosion. Institutional Repository is a new concept for collecting, Managing, disseminating and preserving scholarly works created in digital form by faculty and students in individual universities and colleges in India. Most higher education and research institutions are funded by the central and state governments. These institutions have made a significant contribution to the transmission of knowledge and to research in all fields and disciplines. The libraries of those institutions also play a vital role in acquiring and disseminating information for academic and research activities. Digital libraries are a way of making educational and research data and information available to faculty, researchers, students, and others at the institutions and worldwide.

In this electronic publishing age, academic institutions including universities have increasingly recognized that an institutional repository (IR) is an essential infrastructure of scholarly dissemination. An IR is a digital research archive consisting of accessible collections of scholarly work that represent the intellectual capital of an institution. This paper discusses about the Institutional repositories – contents, benefits, and challenges of the major Institutional repository projects in Karnataka.

Keywords: Digital Library; developing countries; Institutional repository; Open source software; Open Archive Initiatives.

Introduction

The world's universities, museums, governments, and other organizations house treasures that have been hidden in archives, basements, attics, print formats, and a variety of storage devices. These treasures encompass scientific, technological, cultural, artistic, and historical materials generally unavailable to searchers and the public. Institutional repositories are now being created to manage, preserve, and maintain the digital assets, intellectual output, and histories of institutions. Librarians are taking leadership roles in planning and building these repositories, fulfilling their roles as experts in collecting, describing, preserving, and providing stewardship for documents and digital information [1].

Institutional Repositories

Development of institutional repositories has largely taken place in universities. Not-for-profit organizations may find repositories useful for relating the histories of the organizations, raising funds, and creating interest in the projects and activities of the organizations. Repositories provide services to faculty, researchers, and administrators who want to archive research, historic, and creative materials. The open access and open archives movement, the need for changes in scholarly communication to remove barriers to access, and the increasing awareness that universities and research institutions are losing valuable digital and print materials have begun driving the establishment of institutional repositories. Using open archive models [2] , established metadata standards, and digital rights

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management, important new information sources are seeing the light of day and becoming more generally available.

While the main purposes of institutional repositories are to bring together and preserve the intellectual output of a laboratory, department, university, or other entity, the incentives and commitments to change the process of scholarly communication have also begun serving as strong motivators. Computers have been ubiquitous on campuses since the late 1980s. Students and faculty are comfortable with the power of online communication. Faculty teachers and researchers want to archive their own materials and have them available on personal or institutional Web sites, these articles, along with the development of the Internet and more powerful search engines, have enabled people to think in practical terms about the establishment of central facilities for storing, archiving, preserving, and making scholarly and artistic materials available. Librarians have a unique opportunity to fill a void by taking a leadership role in organizing and preserving digital information [3]. Repositories may be limited to one field, one department, one institution, or a consortium of several institutions. Collaboration through a consortium reduces costs for each member through resource sharing while expanding access to digital materials.

For universities, repositories are marketing tools communicating capabilities and quality by showcasing faculty and student research, public service projects, and other activities and collections. Repositories in universities may include preprints and post prints of journal articles, technical reports, white papers, research data, theses, dissertations, work in progress, important print and image collections, teaching and learning materials, and materials documenting the history of the institution, [3].

Institutional Repository Projects

Digital Library of India

The Indian Institute of Science (IISc), Carnegie Mellon University (CMU), the International Institute of Information Technology, Hyderabad (IIITH), and many other academic, religious, and government organizations in India, a total of more than twenty "Content Creation Centres," have become partners in the Digital Library of India (DLI) [4]. The DLI seeks to preserve Indian heritage that is contained in books, manuscripts, art, and music. Each centre brings its own unique collection. This digital library is also a test-bed for Indian language research. The DLI is a leader in worldwide efforts to make knowledge free. A pilot project to scan some 10,000 books was initiated at CMU and then followed up at IISc, IIIT-H, and other organizations. All the processes involved have been perfected. The vision is to preserve all the knowledge of the human race in digital form and make that content searchable, independent of language and location, and to ensure that the cultural heritage of countries like India is not lost during the transition from paper to bits and bytes, as they were lost during a former transition of cultural content from palm leaves to paper. So far, more than 289,000 books have been scanned, of which nearly 170,000 are in Indian languages. More than 84,000 books (25 million pages) are available on the DLI web site at the Indian Institute of Science, and more than 149,000 books (43 million pages) are available on the DLI web site at the International Institute of Information Technology. The link to other partner sites is also provided through a commonly accessible website.

Funding for the DLI comes from multiple sources. The Office of the Principal Scientific Advisor to the Government of India is funding the project at the Indian Institute of Science.

The Ministry of Communication and Information Technology (MCIT) is funding the project at various DLI partner centres. The National Science Foundation (USA) is providing funding for scanners and software research and development through Carnegie Mellon University. The First Citizen of India, His Excellency Dr APJ Abdul Kalam, President, who himself is one of the contributors to this vision, has personally taken a keen interest in making the Rashtrapathi Bhavan one of the major centres of the DLI.

IISc@eprint (Indian Institute of Science)

Eprint @IISc repository [5] collects preserves and disseminates in digital format the research output created by the IISc research community. It enables the Institute community to deposit their preprints, postprints and other scholarly publications using a web interface, and ordganizes these publications for easy retrieval. While eprints@IISc can be accessed by anybody, submission of documents to this repository is limited to the IISc research community only. eprint@IISc repository is running on EPrints open archive software, a freely distributable archive system available from eprints.org. ePrints@IIsc complies with the Open Archives Initiatives (OAI) framework allowing publications to be easily indexed by web search engines and other indexing services.

Vidyanidhi Institutional Repository (Digital library & E-Scholarship Portal@Univerisity of Mysore)

Vidyanidhi is India's premier Digital library initiative [6] to facilitate the creation archiving and accessing of doctoral theses. Vidyanidhi is an initiative that began as a pilot project in the year 2000 to demonstrate the feasibility of ETDs in the Indian context. Vidyanidhi pilot project was sponsored by NISSAT, DSIR, and Government of India. Vidyanidhi is envisioned to evolve as a national repository and a consortium for e-theses through participation and partnership with universities, academic institutions and other stake holders. Vidyanidhi is now expanding and enlarging its horizon from a pilot to a programme with support from the ford Foundation and Microsoft Corporation. It enhances access to Indian theses and enlarges the reach and audience for Indian doctoral research works. It is also using Dspace digital repository software.

Raman Research Institute Digital Repository

The Raman Research Institute *(*RRI) digital repository [7] collects preserves and disseminates in digital format the research output of the RRI community. It enables the RRI community to deposit their preprints, post prints and other publications using a web interface and organizes these publications for easy retrieval. In addition to this, it also contains the annual reports of RRI and newspaper clippings from the Raman archives. It is running on DSpace, open source software which complies with the Open Archives Initiatives (OAI) framework allowing publications to be easily indexed and searched by web search engines and other indexing services.

This contains the research publications of the faculty and students of the Raman Research Institutive. The collected papers of C V Raman and the historical records of the institute annual reports and newspapers clippings are also housed here.

Institutional repository at National Aerospace Laboratories

The Institutional Repository at NAL [8] is the digital archive of the research output of the scientists. Since the inception of NAL during 1959, till date the R&D staffs have published more than 20,000 research publications in various forms. The Information Centre of NAL with its state of the art expertise, infrastructure and services initiated setting up of its own repository during 2003 using, the then most popular open source software Greenstone Digital Library, developed at university of Waikatoo, NZ. More than 300 papers at abstract level along with few full text contributed by the scientists

at NAL we uploaded, but were made accessible only through NAL's Intranet. During 2004, the work progressed rapidly with the adoption of open source software GNU EPrints for archiving and managing the digital collections. The knowledge base of NAL-IR covers Journal Articles, conference Papers, Technical Reports, Presentation/ Lectures, Preprints, Project documents, Patents, Thesis and Images.

Indian Institute of Astrophysics Repository

This is the digital repository of publications of Indian Institute of Astrophysics (IIAP), Bangalore, India, [9] developed to capture, disseminate and preserve research publications of IIAP. The Indian Institute of Astrophysics (IIA) is one of the astronomical research institutes in India pioneering the Open Access movement. The institute has set up a pilot project to store the institute's publications in an institutional repository. This repository also hosts papers published in Bulletin Astronomical Society of India. The library at IIA plays an important role in setting up this archive.

Recently archival collections are being included as another community in the repository.Indian Institute of Astrophysics archives has important collections, some of which are more than 200 years old.The collection of archival records has grown over the years to include more than 5000 items in various formats such as manuscripts, photographs, maps, films, awards, hand-drawn sketches, pictures and instruments. Considerable effort has been put in during last two years for collecting, organizing and preserving and digitizing these materials. It is also using Dspace digital repository software.

Librarian's Digital Library

This repository is at the Documentation Research Training Centre, Indian Statistical Institute, Bangalore [10]. It is aimed at librarians world-wide, and uses DSpace. It contains articles, theses and dissertations, presentations, multi-lingual documents, photographs, etc.

Conclusion

Institutional repositories can make to an evolving, disaggregated scholarly publishing structure capable of addressing many of the current model's dysfunctions, as well as their potential role in enhancing and recognition of work carried out at host institutions. We have to explore the change that institutional repositories will visit on key scholarly communication stakeholders, outlining the benefits that will justify those changes. Institutional repositories can provide an immediate complement to existing scholarly publishing model, while stimulating the emergence of a new disaggregated publishing model that will evolve over time. This outcome will advance the individual and collective interests of faculty researches, academic librarians and institutional administrators.

Digital library activities are gathering momentum in developing countries, especially, Karnataka, India. Most Higher education and research institutions in India are funded and controlled by the central and state governments, clear-cut national plans and policies are needed to infrastructure standards metadata interoperability, multi-lingual database training, co-ordination, copyright, and archiving and preservation methods.

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Awareness of Electronic Resources among the Research Scholars of Anna University of Technology, Coimbatore and its Affiliated Colleges

L. Santhi*, N. Radhakrishnan**

Abstract

The study investigated the awareness of electronics resources by the research scholars of Anna University of Technology, Coimbatore and its affiliated colleges. It examined the research scholar's awareness of the resources available, the type of resources provided by the library. Findings reveal that the most of the researchers are satisfied with E-resources available in their institutions. Some of the research scholars felt that they need orientation to use them.

Keywords: Digital Libraries/ E-resources, usage pattern; research scholars, awareness.

Introduction

In this digital age, Information is a dynamic and valuable resource that effects all the disciplines of academic curricula and every walk of life. Over the last decade, electronic resources have become increasingly substantial components of academic libraries. This is due to the growing development of information technology and its impact on collection development policies in Libraries. Changing trend of users' need for the pin pointed and exhaustive information within a short time has also forced library professionals to ascent electronic products. With the growing popularity of e-resources, the libraries are gradually migrating from printed documents to e-resources. Giving an access to information is considered to be more important than owning it. This has led the academic environment to re-look into their collection development and functioning. Application of information communication technology (**ICT**) in libraries has given enough opportunities for building e-resources and disseminates them to suit the needs of its patrons.

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Need for the study

Due to the search to e-journals and e-databases and also the emphasis made by AICTE enhancing the ICT tools for Library and Information science, consortia models like INDEST, UGC-Infonet and other library networks have made opportunities for higher academic libraries to provide access to e-resources. Hence it is necessary to conduct studies to asses the pattern of e-resource access and its impact among the academics.

Statement of the problem

Print resources are slowly getting vanished and institutions are realizing to subscribe electronic resources so as to satisfy the users. Still some of the Engineering colleges in India have not realized the importance of electronic collections and their utility. There are some consortia / networks which assist academic libraries to get online databases at subsidized cost. There are 1100 colleges / institutions joined with INDEST-AICTE which provides online databases to its approved institutions in India. Hence the study "Awareness of Electronic resources among the research scholars of Anna University of Technology, Coimbatore and its affiliated colleges" were taken.

Objectives of the Study

The main objectives of this study are

1. To identify the level of awareness about open source and subscribed e-resources among the research scholars.
2. To identify the various search techniques / strategies adopted by the research scholars in accessing e-resources.

Hypotheses

There is a noteworthy difference between male and female researchers on familiarity with e –resources.

Review of literature

Hewiston's (2002) study," Use and awareness of electronic information services by academic staff at Leeds Metropolitan University – A qualitative study" explores the results of an investigation into the awareness and extent to which the university's academics staff use and assimilate electronic Information Services (EIS s) into their work. The research was conducted using two methods; a quantitative study involving a questionnaire mailed to a random stratified sample of 200 university staff and a qualitative study, which addressed four specific areas; the characteristics of the respondents (age, gender, faculty); the perceived feel of the information technology (IT) literacy of staff; the university and academic staff, and perception of students. The study investigated a number of other areas including: how academic staff of the university obtained information for their work; how aware university staffs are of EIS; how confident are academic staff in using EIS and the barriers that exists to their use; the extent to which academic staff integrate the use of EIS into students' educational lenience; and what the university can do to support staff better in their use of EIS.

Methodology

Research Design

The present study has been carried out under empirical research method. This study involves both primary, secondary data and wide interaction with sample group. Empirical study is identified as appropriate one for the present study. Simple Random sampling method is chosen as far as primary data is concerned.

Sources of Data

Primary data were the research scholars of different discipline in affiliated colleges of Anna University of Technology, Coimbatore. The secondary data includes survey reports, research papers, books, journals, College web sites and monographs.

Data Collection

The researcher had visited the colleges, distributed the questionnaires and received the filled-in questionnaires from the respondents. The affiliated colleges are spread over the following districts. 1. Coimbatore, 2.Thiruppur, 3.Erode, 4.Salem, 5.Namakkal, 6.Karur, 7.Dharmapuri and 8. Krishnagiri.

Sample Design

There were 781 research scholars registered for doing Ph.D in different disciplines in the year 2007-08. Out of total population (781), 610 respondents were randomly served the questionnaire for the present study. 499 respondents gave their feed back at the response rate of 81.80%.

The questionnaire is divided into six parts. In the first part, personal details such as gender, location, age, qualification, designation, experience, etc are to be furnished. The second part contains details of the institutions and their services. The third part provides awareness of electronic resources. Fourth part deals with utilizations of electronic resources. Fifth part contains impact of electronic resources. Sixth part shows opinion about electronic resources.

A five point scale comprising "strongly agree" "agree" "disagree" "strongly disagree" "No opinion" were used to elicit the responses of the research scholars.

Scope & limitations of the study

The study is confined to researchers who are doing Ph.D in Anna University, Coimbatore and its affiliated institutions.

There was a scope for covering research scholars who have registered for Ph.D from July 2007 to till date. Due to time limitation, the study is confined to July 2007 and April 2008 batches of research scholars. Further the study includes the attitude and usage pattern of research scholars, library environment of the study area and impact of the electronic resources.

Analysis and interpretation of the data

The data collected have been analyzed and interpreted using tables and statistical methods.

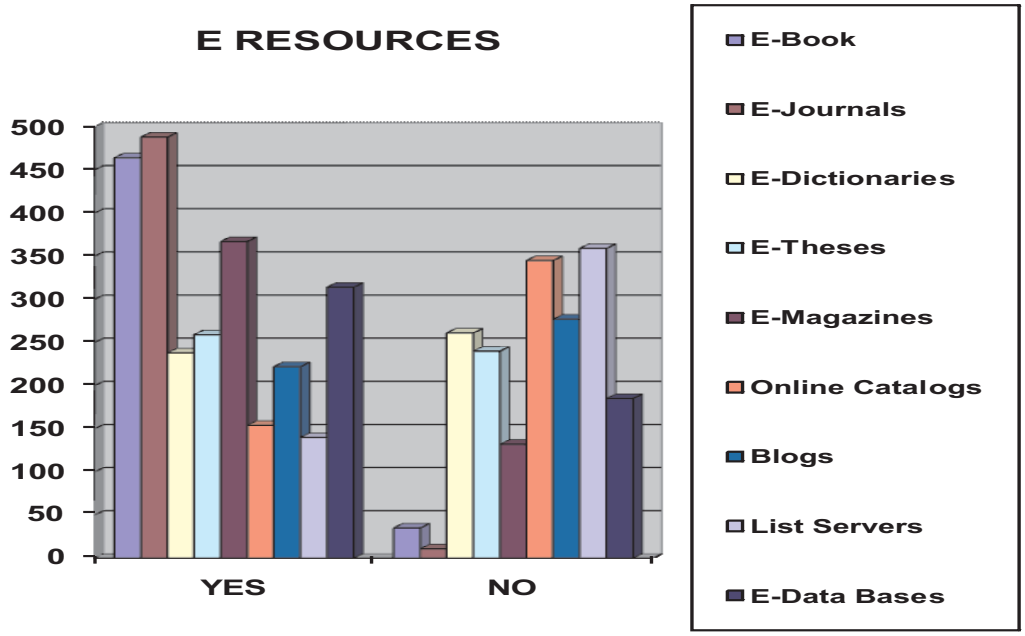
Statistical Tools Used

SPSS package has been used to validate the data being collected. The statistical and economical tools like Percentage Analysis, Chi-Square Test and Analysis of Variance were applied for the analysis of the study so as to arrive at conclusions which will indicate effective implications of the study.

9.1: Awareness of E - Resources

S.No	Variable	Status / No of Respondents		
		Aware	Unaware	Total
1	Aware of Electronic Resources	475 (95.2)	24 (4.8)	**499 (100)**
2	**Search Engine**			
2.1	Google	498 (99.8)	1 (0.2)	
2.2	Alta Vista	280 (56.1)	219 (43.9)	
2.3	Yahoo	450 (90.2)	49 (9.8)	
2.4	MSN	287 (57.5)	212 (42.5)	
2.5	Rediff	391 (78.4)	108 (21.6)	**499 (100)**
2.6	Info Seek	146 (29.3)	353 (70.7)	
2.7	Ask	225 (45.1)	274 (54.9)	
2.8	Lycos	191 (38.3)	308 (61.7)	
2.9	Excite	156 (31.3)	343 (68.7)	
2.1	Web Crawler	164 (32.9)	335 (67.1)	
3	**E-Resources**			
3.1	E-Book	464 (93)	35 (7)	
3.2	E-Journals	488 (97.8)	11 (2.2)	
3.3	E-Dictionaries	238 (47.7)	261 (52.3)	
3.4	E-Theses	259 (51.9)	240 (48.1)	
3.5	E-Magazines	367 (73.5)	132 (26.5)	**499 (100)**
3.6	Online Catalogs	154 (30.9)	345 (69.1)	
3.7	Blogs	222 (44.5)	277 (55.5)	
3.8	List Servers	140 (28.1)	359 (71.9)	
3.9	E-Data Bases	314 (62.9)	185 (37.1)	
4	**4. Aware of the Digital Library Consortium**			
4.1	INDEST - AICTE	355 (71.10)	144 (28.9)	**499 (100)**
4.2	UGC INFONET	107 (21.4)	392 (78.6)	

5.1	INDEST - AICTE Consortium and Awareness of E-Journals	353 (70.7)	146 (29.3)	**499 (100)**
5.2	INDEST - AICTE Consortium and Effective Use of E- Journals	237 (47.5)	262 (52.5)	
6	**Full Text E-Resources**			
6.1	ACM Digital Library	250 (50.1)	249 (49.9)	
6.2	ASME Journals	189 (37.9)	310 (62.1)	
6.3	EBSCO Data bases	79 (15.8)	420 (84.2)	
6.4	Elsevier's Science Direct	261 (52.3)	238 (47.7)	**499 (100)**
6.5	Emerald Full Text	179 (35.9)	320 (64.1)	
6.6	IEEE/IEL on Electronic Library Online	400 (80.2)	99 (19.8)	
6.7	Pro Quest Science	94 (18.8)	405 (81.2)	
6.8	Springer Link	328 (65.7)	171 (34.3)	
7	**Bibliographic Databases**			
7.1	COMPENDEX on EI Village	72 (14.4)	427 (85.6)	
7.2	J-GATE Custom Content for Consortia	153 (30.7)	346 (69.3)	
7.3	MathSciNet	33 (6.6)	466 (93.4)	**499 (100)**
7.4	Scifinder Scholar	53 (10.6)	446 (89.4)	
7.5	Web of Science	173 (34.7)	326 (65.3)	
8	**Open Access Resources**			
8.1	Open Access E-Journals	434 (87)	65 (13)	
8.2	Open Access Directories	144 (28.9)	355 (71.1)	**499 (100)**
8.3	Irs@ Member Institutions	87 (17.4)	412 (82.6)	



Awareness of E-Resources can be classified based on the Search Engines, E-Resources, Digital Library Consortium, Full Text E-Resources, Bibliographic Databases and Open Access resources.

Awareness of E - Resources

From the above table analysis shows that 475(95.2%) respondents were aware of the E-resources and 24(4.8%) were not aware of the E-resources.

S.No 2 highlighted the Search Engine and awareness of the search engine for the respondents. From the S.No 2.1 shows 498(99.8%) aware of Google Search engine . 464 (93%) respondents replied that they are aware of the E-books , 488 (97.8%) respondents are aware of the E-Journals. 238 (47.7%) respondents are aware of the E-dictionaries whereas 261(52.3%) were not aware of the E-Dictionaries.259(51.9%) were aware of the E-Theses 240(48.1) replied not aware of the E-Theses. 367(73.5%) responded that they are aware of the E-magazines and 132(26.5%) were not aware. 154(30.9%) respondents were aware of the online catalogs whereas 345(69.1%) replied that not aware. 222(44.5%) respondents aware of the Blogs and 277(55.5%) were not aware of the Blogs. 140(28.1%) were aware of List servers and 359(71.9%) replied that not aware of the List servers. 314(62.9%) response from awareness of E-Databases and 185(37.1%) not aware of the Databases.355(71.10%) were aware of the INDEST-AICTE consortium whereas 144(28.9%) were not aware of the consortium. .107 (21.4%) responded for awareness and 392(78.6%) responded not aware of the above said consortium.S.No 5.1 in the above table explains INDEST –AICTE consortium provides E-Journals. The respondents were asked whether they are aware of the E-journals.

Chi – Square Test Result for the Male and Female awareness and unawareness with regard to digital library consortium

S.No	Variables	Aware		Unaware		Chi^2 (df;p(s)
		Male	Female	Male	Female	
1	INDEST-AICTE	49.1	22	16.8	12	5.203(1;0.028)
2	UGC-INFONET	14	7.4	51.9	26.7	0.016(1;0.909)

Table 1.1: Chi – Square Test Result for the Male and Female awareness and unawareness with regard to full text electronic resources

1.	ACM	31.9	18.2	33.9	16	1.663(2;0.435)
2.	ASME	28.3	9.6	37.7	24.4	10.184(1;0.002)
3.	EBSCO	10	5.8	55.9	28.3	0.291(1;0.606)
4.	ELSEVIER'S Science Direct	35.5	16.8	30.5	17.2	0.865(1;0.395)
5.	Emerald Full Text	24.2	11.6	41.7	22.4	0.345(1;0.623)
6.	IEEE/IEL	52.7	27.5	13.2	6.6	0.03(1;0.906)
7.	ProQuest Science	12.2	6.6	53.7	27.5	0.056(1;0.81)
8.	Springer Link	43.7	22	22.2	12	0.12(1;0.766)

353(70.7%) replied that aware of the E-journals and 146(29.3%) were not aware of the E-journals.S.No 5.2 in the above table the respondents were asked to whether they are using E-journals effectively if they are aware of the Consortium. The response 237(47.5%) replied they are using effectively e-resources and 262(52.5%) were not using E-resources effectively.

250(50.1%) have the knowledge about ACM digital Library and 249(49.9%), responded not aware of the ACM, 189(37.9%) have the knowledge about ASME Journals and 310(62.1%), responded not aware of the ASME Journals, 79(15.8%) have the knowledge about EBSCO Databases and 420(84.2%), responded not aware of the EBSCO Databases, 261(52.3%) have the knowledge about Elsevier's Science Direct and 238(47.7%), responded not aware, 179(35.9%) have the knowledge about Emerald Full Text and 320(64.1%), responded not aware of the Emerald Full Text, 400(80.2%) have the knowledge about IEEE/IEL online and 99(19.8%), responded not aware of the IEEE/IEL, 94(18.8%) have the knowledge about Proquest Science and 405(81.2%), responded not aware of the Proquest Science, 328(65.7%) have the knowledge about Springer Link and 171(34.3%), responded not aware of the Springer Link Journals.

From the above Table S.No 7 .1 to 7.5explains Bibliographic Databases and its familiarity.72(14.4%) shows familiarity with COMPENDEX on EI Village and 427(85.6%) responded non familiarity, 153(30.7%) shows familiarity with J-GATE Custom content for Consortia and 346(69.3%) responded non familiarity, 33(6.6%) shows familiarity with Mathscinet and 466(93.4%) responded non familiarity, 53(10.6%) shows familiarity with Scifinder Scholar and 446(89.4%) responded non familiarity, 173(34.7%) shows familiarity with Web of science and 326(65.3%) responded non familiarity with web of Science.

434(87%) respondents replied that aware of the open access E-journals and 65(13%) not aware of the open access E-journals, 144(28.9%) respondents replied that aware of the open access E-Directories and 355(71.1%) not aware of the open access E-Directories, 87(17.4%) respondents replied that aware of the IRs@ member institutions and 412(82.6%) were not aware.

Table 1.2: Chi – Square Test Result for the Male and Female awareness and unawareness with regard to bibliographic databases

1	Compendex on EI Village	10	4.4	55.9	29.7	0.462(1;0.591)
2	J-Gate Custom Content for Consortia (JCCC)	22.2	8.6	43.7	25.5	6.074(2;0.048)
3	MathSciNet	5	1.6	60.9	32.5	1.519(1;0.257)
4	SciFinder Scholar	7.2	3.4	58.7	30.7	0.105(1;0.878)
5	Web of Science	24	10.6	41.9	23.4	1.389(1;.275)

Hypotheses testing

Ho: There is no association between gender and awareness

Level of significance: Let the level of significance (á) be 5% or 0.05

The analysis between gender and awareness towards full text electronic resources concerned, the chi-square test results in the p value is 0.002, which is less than 5% level of significance. Hence we reject

Table 1.3 Chi – Square Test Result for the Male and Female awareness and unawareness with regard to open access resources

1	Open Access E-Journals	1	28.5	7.4	5.6	2.7(1;0.122)
2	Open Access Directories	19.8	9	46.1	25.1	0.716(1;0.407)
3	Irs@ Member Institutions	12	5.6	53.7	28.5	0.641(2;0.726)

Hypothesis. Thus, the inferences highlights that there is significant difference between male and female researchers on familiarity with ASME Journals compared to other full text electronic resources like ACM, EBSCO, Elsevier's science direct, emerald full text, IEEE/IEL, proquest science and springerlink.

As far as Bibliographic databases are concerned, the chi-square test result in the p value is 0.048, which is less than 5% level of significance. Hence we reject H0. These remarks say that there is significant difference between male and female researchers on familiarity with J-Gate custom content for consortia compared to the other bibliographic databases like Compendex on EI village, MathsciNet, Scifinder scholar, and Web of science.

The analysis of gender and awareness towards open access electronic resources among the respondents exhibits that the p value is greater than the level of significance at 5% level. It shows that there is no significant difference between the awareness level of male and female researchers towards open access electronic resources. Hence the hypothesis is accepted.

Conclusion

It has been observed that most of the researchers are satisfied with E-resources available in their institutions. Some of the research scholars felt that they need orientation to use them and most of them are not aware of open access e-resources.

Scope for futurework

Since the present study covered only research scholars who had registered with Anna University of Technology, Coimbatore. A major level project can be taken up in the state of Tamil Nadu or even in India with the financial support from any funding agencies like UGC, AICTE etc.

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Use and Awareness of Electronic Mail in Selected B.Ed. College Students of Gulbarga City

Syed Shah Ahmed Sarmast*, Syed Shoukat Ali**

Abstract

An attempt has been made to determine the present status of knowledge and use of electronic mail. It was observed that use of electronic mail is still inadequate among the students of B.Ed colleges of Gulbarga City . This paper presents the findings of a survey about the knowledge and use of e mail by students of B Ed colleges. For evaluating the study questions and data collection, the questionnaire was distributed to a random sample of 260 students.

The result of this survey are presented and discussed in this paper.

Keywords: E mail; Information resource; B Ed colleges.

Introduction

Information network and information communication technology nowadays has grown tremendously. Technology has evolved like one of the basic needs of our daily life and Internet is one of them. Transfer of information and documents becomes very easy because of Internet and E-mail service .From USA's ARPANET till today, this concept has progressed at lightning speed. Many developments have taken place to make e-mail service faster and effective. Today, it seems easy, but many protocols have been working behind sending or receiving an E-mail.

In the field of education E-mail is an effective way of learning; thus, an attempt has been made to understand the awareness regarding E-mail and its uses in the students of selected B Ed colleges of Gulbarga City.

Objectives

1. To understand the awareness of E-mail.
2. To find out the purpose and utilization of E-mail and its services by students.
3. To find out communication of students through E-mail.
4. To find out the status regarding E-mail usage.
5. To study the problems in accessing E-mail by the students.
6. To give proper suggestions for optimizing the use of E-mail

Scope

The subjects of the study wre students of B.Ed. colleges including Deccan B.Ed College, Jai Hind B Ed College, Ayesha B Ed College for Women & Deccan B.Ed College for Women of Gulbarga City.

Methodology

In order to bring the authenticity of the research, a detailed questionnaire was developed. The questionnaire was formulated in a way that all the possible queries would lead to one goal.

Population

A total of 260 questionnaires were distributed out of which 236 (91%) were received from students of Deccan B.Ed.

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College, Jai Hind B Ed College , Ayesha B Ed College for Women & Deccan B.Ed. College for Women of Gulbarga City.

Findings

An attempt was made to give summary of the findings of the study and suggestions to improve the usage of Electronic-mail (E-mail) in the B.Ed colleges of Gulbarga City.

1. From a total of 236 respondents 170 were female (72%) and 66 (28%) male.
2. It was observed that 165 (70%) respondents were from urban and remaining 76 (30%) from rural areas.
3. It was found that 180 (74%) students were unaware about E-mail and 55 (26%) were aware of E-mail.
4. It was observed that 55 (26%) respondents knew how to create E-mail.
5. Out of 55 respondents, 18 (37%) respondents were beginner.
6. All the 55 respondents were aware of Inbox.
7. Study revealed that 38 (70%) students knew how to compose and send E-mail.
8. Out of 55, 33 (60%) respondents used E-mail for sending attachments.
9. Out of 55 students, 48 (86%) checked their mail frequently.
10. Twenty eight respondents (55%) out of 55 replaced to their mails frequently.
11. The study showed that 36 (67%) respondents forwarded their E-mails frequently.
12. Out of 55, 46 (84%) respondents knew how to chat.
13. All the 55 students from 236 knew how to Logout.

Suggestions

- More facility should be provide to access Internet.
- Provision for separate section for Internet facility at hostel, college & library.
- Regular training & awareness program should be conducted.
- More emphasis should be given to computer education in the syllabus.
- Provide strong infrastructure facility for access to Internet
- Adoption of broad-band technology for Internet.
- Awareness about the worthiness of E-mail as electronic information, communication media.

Conclusion

Implementing ICT into education curriculum should make a huge impact in the way the students learn and the way they teach in future, if we work first on providing the appropriate training to the students, and, of course, making Internet accessible to everybody since e-learning is beneficial and cost effective. Educational authorities should train students to improve their Internet skills, and should pay more attention to female students. Teachers should aid students to get trusted information from the Internet and should communicate more with their students using E-mail forum and other new technologies.

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A Citation Analysis of the Indian Journal of Engineering and Materials Science

Kousik Chatterjee

Abstract:

The study analyses 89 full-length Research Articles published during 2007-08 in the Indian Journal of Engineering and Materials Science. Indian Journal of Engineering and Materials Science is linked most closely with Aerospace Engineering, Mechanical, Metallurgical, Electrical and Electronics Engineering, Computer Science, Environmental Engineering, Heat Transfer, Fluid Mechanics, Instrumentation and Materials Science. Overall, 1662 citations were made during this period. The results indicate that 25.84% articles (citing articles) published in these issues were three authored. The authorship pattern of citation (cited articles) shows that 17.07% papers are single authored, 20.35% and 27.64% papers were double and triple authored respectively. The result reveals that journal articles were predominant with 80.35% of total citation. The ratio of Author Self Citation to Total Citations was 1:10.7. The ratio of Journal Self Citation to Total Citations was 1:17.Indian contributions comprise 19% of the total citations. The highest percentage of year-wise journal citation was found to be 39.22% in the period of 2001-2008.

Key words: Authorship Pattern; Citation Analysis; Indian Journal of Engineering and Materials science; Bibliometrics.

Introduction

Citation analysis has been widely used to investigate the structure of scholarly articles in various subject fields like natural and social sciences as well as in the field of technology and applied sciences.

An essential part of research papers, particularly in the domain of applied science and technology, is the list of references pointing to prior publications. In general, according to Smith [(10)], a citation implies a relationship between a part or the whole of the citing documents. Citation analysis is that area of bibliometrics that deals with the study of these relationships. Norms for citing as well as authorship patterns vary greatly from disciplines to disciplines.

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Just as there are a number of reasons why citations exist [(10)], there may be a number of reasons why a citing author has not provided a link to certain other documents. The reason is that a prior document is not relevant to the present work or author was unaware of document or could not obtain it or could not read the language in which it was published.

The popular and easiest technique[10] to use a citation count is determining how many citations have been received by a given document or set of documents over a period of time from a particular set of citing documents.

Present trend, quality of science and technology journals in India and Scope of Indian Journal of Engineering and Materials Science

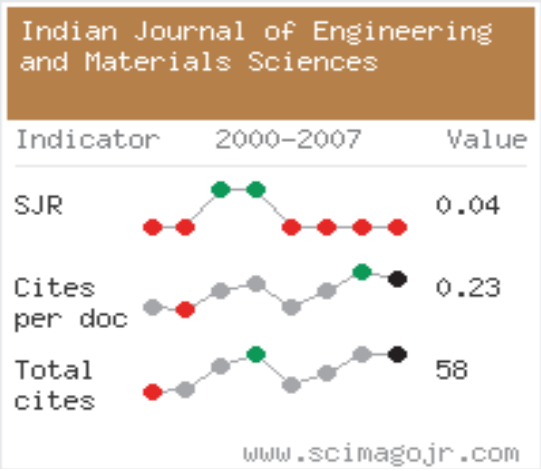
The Accreditation bodies and quality control mechanisms insist the academic institutions in the country to acquire quality and standard journals. It has been well documented that most of the Indian journals in the field of Science and Technology lack quality in content.

Major criticisms are leveled against Indian journals in the recent past. International databases and secondary services include only a very few Indian journals. The simple reason is that many Indian journals do not have peer review policy [2]. A journal is accepted as a qualitative and standard journal only when it is peer reviewed (if possible international peers) and it has international editorial board and has international authorship.[2]

A present study commissioned by the Department of Science and Technology has identified a few peer reviewed journals in the Science and Technology. According to this study, [2] only less than 10% journals published from India are standard and quality journals. Peer reviewed journals lists 75 journals in the field of Engineering and Technology in which Indian Journal of Engineering and Materials Science is included(S l No.15)[2].

SCImago Journal and Country Rank [9] is a portal that includes the journals and country scientific indicator, developed from the information contained in the Scopus database(Elsevier B.V). These indicators can be used to assess and analyze scientific domains .The platform takes it name from the SCImago Journal Rank(SJR) indicator developed by SCImago from the widely known algorithm google page rank. According to SJR, H Index [9] of the Indian Journal of Engineering and Materials Science is 9(in 2007).

Indian Journal of Engineering and Materials Science was published by National Institute of Science Communication and Information Resources (NISCAIR) in association with Indian National Science Academy. Started in 1994, it publishes papers in Aerospace Engineering, Mechanical, Metallurgical, Electrical and Electronics Engineering, Computer Science, Environmental Engineering, Heat Transfer, Fluid Mechanics, Instrumentation and Materials Science. The Journal is issued bimonthly and indexed by Applied Mechanical Review, Chemical Abstract, Current Contents, Metal Abstract, Engineers India, Cambridge Science Abstract, and Math review, NCI Current Contents, ARAI Automotive Abstract and Indian Science Abstract.



Objective

The objectives of the present study were to find out :

- Authorship pattern of cited documents
- Authorship pattern of citing documents
- Citations according to documentary form
- Percentage of Indian cited references.
- Percentage of Indian authors in citing articles.
- Comparison between journal self citation & total citation.
- Comparison between journal self citation and author self citation.
- Year-wise citation.

Scope

Present study was based on 1662 citations appended to 89 full length research articles published in the Indian Journal of Engineering and Materials Science (including special issue) in the period 2007-08. As such, on average, an article has almost 19 references.

Methodology

The citations appended to each article were scanned and tabulated by employing systematic sampling method. For each cited reference the following data was recorded and analyzed.

Table 1: Authorship patterns of citations (cited articles)

No. of Authors	No. of Citations	Percentage	Ranking
One	286	17.20	4
Two	341	20.51	3
Three	463	27.85	1
Four	409	24.60	2
Five	149	8.96	5
More than 5	14	0.84	6
Total	**1662**	**100**	

a. Number of authors
b. Type of document
c. Origin
d. Whether author self citation
e. Whether journals self citation
f. Year-wise distributed

For citing articles origin of authors, frequency and number of authors were also distributed.

Analysis and Interpretation of data

The data collected in order to fulfill the objective stated above was analyzed critically and presented in the following tables.

Table 1 summarizes break up of citations and ranking according to number of authors. It shows that single authored papers amount to 17.2%. Two-and-three-authored contributions is quite substantial in the field. A contribution by 5 or more authors totals almost 10% of the total contributions. Table 1 clearly indicates that three-and-four-authored contributions are most popular.

Table 2 indicates that journal articles top the list with 80.44% citations to their credit followed by monographs (11.79%) and conference papers (4.75%). The study revealed that authors preferred to refer mostly to the journal articles for support of their thought or preparation of a scholarly publication. Use of e-sources was least preferred by the authors.

Table 3 provides the citation of Indian and foreign documents. It was observed that out of 1662 citations, 1348(81.09%) were of foreign authors and remaining 314(18.87%) citations were of Indian authors. Citations according to form of documents showed that the journal citations of foreign authors were more than the Indian authors' citations. In case of monographs, citation of Indian authors was more than foreign authors. It is likely that higher number of foreign citations (specially journals) could be due to quality, standard, information content of foreign publication. In case of conference proceedings, thesis, preprint, Indian authors' citations were much more than foreign citation.

In case of citing articles, authorship patterns were found to be of three types (i) Indian (ii) foreign and (iii) mixed. In this study of 89 research papers, 69(77.5%) were by Indian

Table 2: Distribution of cited references according to form of documents

Sl No.	Type of Document	No. of citations	Percentage%	Rank
1	Journal article	1337	80.44	1
2	Monographs	196	11.79	2
3	Conference/ symposium / workshop etc.	79	4.75	3
4	Thesis & Dissertation	17	1.02	5
5	Preprints	24	1.44	4
6	Patents, Standards	4	0.24	7
7	E sources	5	0.30	6

Table 3: Ratio of Indian to foreign citation

Sl No.	Type of Document	No. of Indian Citation		No. of Foreign Citation		Ratio IC:FC
		Total	%	Total	%	
1	Journal article	103	6.19	1234	74.24	1:12
2	Monographs	119	7.16	77	4.63	1:0.65
3	Conference/symposium /workshop etc.	59	3.54	20	1.2	1:0.34
4	Thesis & Dissertation	12	0.72	5	0.3	1:0.42
5	Preprints	19	1.14	5	0.30	1:0.27
6	Patents, Standards	2	0.12	2	0.12	1:1
7	E sources	-	-	5	0.3	-
Total		**314**	**18.87**	**1348**	**81.09**	

Table 4: Authors self citations

No. Of Articles	Total Citations (TC)	Author Self Citation (ASC)	% of Author Self Citation	ASC:TC
89	1662	155	9.33	1:11

Table 5: Journal self citations

No. Of Articles	Total Citations (TC)	Journal Self Citation (JSC)	% of Journal Self Citation	JSC:TC
89	1662	6	0.36	1:17

Table 6: Comparison between journal self citation and author self citations

No. Of Articles	Total Citations (TC)	Journal Self Citation (JSC)	Author Self Citation (ASC)	% of JSC	% of ASC	JSC:ASC
89	1662	6	155	0.36	9.33	1:26

Table 7: Year-wise journal citations

Period	Total Citation	% of Citation
1911-20	2	0.12
1931-40	3	0.18
1941-50	12	0.72
1951-60	24	1.44
1961-70	67	4.09
1971-80	123	7.4
1981-90	237	14.25
1991-2000	542	32.61
2001-08	652	39.22
Total	**1662**	

authors, 17(19.1%) by foreign authors and 3(3.37%) by mixed authorship. It may be due to the popularity, circulation, prestige, standard of the journal in international circle being quite low compared to the high impact journals in the field. The results indicate that 25.84% articles published in these issues (Citing Articles) were three authored followed by four-authored (23.59%) articles, two-authored articles (22.47%). Out of 263 authors, 203 authors were of Indian origin (77%).

Present study identify 155 author self citations that accounts for 9.33% of the

citation. The ratio of author self citation to total citation was 1:11.

Journal self citation is an important bibliometric indicator that gives an indication about the popularity of the journal among its contributors as well as the user community. The percentage of self citation of many reputed journals of the world was found to be over 20% [8]. The study indicated 6 out of total citations comprising 0.36% which is lower as compared to the percentage of JSC of internationally reputed journals.[8]

The ratio of JSC and ASC is a good indicator for the quality of journal. Table 6 summarizes 0.36% of JSC and 9.33% ASC which accounts for the ratio of 1:26.The low percentage of journal self citation reveals that the journal is not so much popular among its contributors and user community or it does not convey quality work of good standard.

Table 7 reveals year-wise journal citations. It is noted that the period 2001-08 and 1991-2000 had the highest 652(39.22%) and 542(32.61%) citations respectively. The maximum number of citations were done in these periods. It is clear that a majority of documents cited in these issues were published not more than 20 years ago.

Conclusion

On the basis of the analysis, it is revealed that the journal carried articles mostly of group research. Contributors have cited maximum number of foreign authors/ researchers in their respective papers. The percentage of journal self citation is low indicating that journal may not be so much popular among its user community. In SJR ranking in India, Indian Journal of Engineering and Materials Science ranked second only after Sadhana Academy Proceedings in Engineering Science with SJR(0,041) and H Index 9 in the year 2007 and its Impact Factor is 00.272[9]. It is worth mentioning that the journal is hardly a decade old and sponsors have ample scope for improving its quality and standard in order to become a reputed journal in the field of engineering.

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A Review of E-government Services in Nigeria

Gbola Olasina

Abstract

Government and public sector managers worldwide have, within the last decade, come to the realization that Information and Communication Technology (ICT) is a viable tool that can help them achieve their aims: to deliver efficient and cost effective services to its citizenry, clients and partners. To this end, governments in most developed and developing countries of the world are at different stages of adoption and implementation of their chosen e-government policies and initiatives in a bid to reform their public sector and improve on its services deliveries, as is the case with Nigeria. The present case will review literature on e-government services and applications available to the public in Nigeria. Adoption of e-government applications and services for public to access government information, documents, resources and for archiving has transformed traditional government services' delivery in countries in Europe and America and some developing countries in Africa with attendant implications for governments and citizens in developing countries.

The methodology will be a review of related literature and will draw up conclusions from the literature to propose a plan for e-government services in Nigeria. The mission of the study is to jumpstart a national discourse on the phenomenon of use of ICT to transform internal and external relationships through operations and expectations about performance of government and to define related concepts and viewpoints. This will be achieved by giving a clear and better understanding of why and how Nigerian citizens use e-government services. By highlighting the contemporary issue of e-government services in Nigeria, this case will be focusing on the growing area of e-governance and ICT in service delivery in Nigeria.

Keywords: E-government; Information and Communication Technology; Electronic government services; Nigeria.

Introduction

There has suddenly been an escalation of e-government initiatives across sub-saharan Africa, as has been the case in other parts of the world even much earlier. The success of these initiatives in Africa, Nigeria in particular, is another issue. E-government is the use of information technology to support government operations, engage citizens and provide government services. E-government is the use of information technology to provide citizens and organizations with more convenient access to government information and services and to provide delivery of public services to citizens, business partners, and those working in the public sector. E-government incorporates four key elements that, when combined, create a unified process: e-services, e-commerce, e-democracy, and e-management (Sudhai, 2003). The World Bank defines e-government as t*he use of information and communication technologies to improve the efficiency, effectiveness, transparency and accountability of governance.* National eGovernment Strategies Limited, *Nigeria (NeGst) describes e-governance as deploying ICT tools and processes for efficient administration and*

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enhanced revenue generation for better governance. Emergence of e-government was signaled by the initial part of implementation of "computerization" of public offices, enabling them by building their capacity for better service delivery and bringing in good governance using technology as a catalyst. The second part was provision of citizen-centric services through digital media like developing interactive government portals. Dada (2006) says e-government is a lot more than mere computerization of government services. It is more of a belief in the ability of technology to transform relations between the government and the governed and bring improvements in governance. The countries with remarkable e-governance initiatives are New Zealand, Canada and Singapore. The evolution of this concept of e-government is traceable to the United States which was especially driven by the 1998 Government Paperwork Elimination Act and by President Clinton's December 17, 1999, Memorandum on E-Government, which ordered the top 500 forms used by citizens to be placed online by December 2000. The memorandum also directed agencies to construct a secure e-government infrastructure (Wikipedia).

The aim of e-government and its spin-offs, E-Democracy, E-Participation, E-Procurement, E-Health, E-Learning, E-Transportation, E-tax and a range of other "E-s", according to Bertot, Jaeger and McClure (2008), is basically to engage citizenry in government in a user-centered manner, and also to develop quality government services and delivery systems that are efficient and effective. The authors also suggest that the concept can be user-centred, citizen centred. In the Southern African case, countries such as Mauritius, South Africa, Mozambique, Botswana and Namibia have started putting in place institutional and regulatory frameworks solely dedicated for the advancement of e-government adoption (UN e-govt. report, 2008). According to Hecks (2008) benefits of e-government include improving government processes-eAdministration, connecting Citizens-eCitizens and eServices; building external interactions- eSociety. Efficient and effective e-government suggests that governments will gain economies of scale, reduce costs, and provide technology-enabled user services. From review of literature, there appears no question as to whether the state is not better placed to use the medium of information and communication technology (ICT) to fast-track service delivery to the citizens, given the resources - both human and capital - at its disposal, particularly when the provision of these services will not only give satisfaction to the citizenry and people doing business with the state, but will also generate tremendous income for the state by way of taxes, fees and levies paid for these services. This is without saying anything about blocking the drains in government revenue drive.

This review seeks to explore efforts in academic work on the issue of e-government in Nigeria, as we have much literature on Botswana, Zambia and South Africa. The initiative and development of e-government (e-Gov) in Nigeria is a kind of national strategy and systemic engineering. As a way to locate its progress, the review of literature on the subject as a prelude to further studies and evaluation of e-gov platforms, websites, and service capabilities is critical and meaningful for their further development deeply. The purpose of this paper is also to provide an outline of reasons for the failure of e-government in Nigeria, giving a study of what went wrong with the country's initiatives on the concept. According to Bertot, Jaeger and McClure (2008), a key issue is that citizen-centered e-government implies that governments know what citizens want from e-government. They want to meet citizens' expectations and needs, and actively seek to discover what citizens want from e-government. The situation in Nigeria will be reviewed alongside this perspective. The use of ICT by government for external relations with citizens will be emphasized to highlight the advantages of e-interactions with the public to foster good relationships, transparency, legitimacy and bring government closer to the governed. It will also highlight the government agencies such as the

NITDA in driving governments' ICT implementation strategy. Governance in Nigeria is a three-tier structured approach, namely; Federal, State and Local governments, and e-government services will be reviewed alongside this approach.

Kumar, Bhasker, Butt and Persaud (2007) find two academic models on the e-government discourse. First, Warkentin et al. (2002) propose a conceptual model of e-government adoption with citizen trust as the underlying catalyst for adoption. Other variables in this conceptual model are perceived risk, perceived behavioural control, perceived usefulness, and perceived ease of use. Second, the model proposed by Gilbert and Balestrini (2004) combines attitude -based and service -quality -based approaches. A dependent variable to this model is a willingness to use e-government services. Independent variables are perceived barriers and perceived relative benefits. Perceived barriers consist of confidentiality, ease of use, safety, reliability, visual appeal, and enjoyment. Perceived relative benefits include time, cost, personalization, convenience, control, and avoidance of personal interaction. The former will guide this review.

E-Government in Nigeria: Problems and Prospects

A review of literature by Avgerou and Walsham (2000) finds, rather sadly, that even though some successful stories of e-government exist in developing countries, "frustrating stories of systems which failed …are more frequent". According to Ikhemuemhe (2003), "the Federal Government of Nigeria has embarked on the construction of a government portal on the internet. This is to facilitate the development of government-to-government, government-to-commerce, and commerce-to-government interactions on the web..." Recognition and initial comments on e-government came from the political leadership in Nigeria and were represented in the comments of then Vice-President Atiku Abubakar in 2008 that the federal Government of Nigeria planned to commence e-government in that year. Atiku was quoted to have said this at the launch of the Bureau of Public Enterprises (BPE) website in Abuja that "the Federal Government recognised the role of Information Technology (IT) in modern business and public administration and was therefore prepared to squarely face the challenges..." (allafrica.com). The strategy of the Nigerian government was to concentrate on putting in place new incentives, levers and institutional structures to make sure this transformation includes new funding and sharpened financial incentives to promote electronic service delivery, and the creation of a government incubator to develop new service ideas. The e-government project of the Federal Government was being anchored by the Federal Office of Statistics (FOS) but had setbacks in its inception (Ikhemuemhe, 2003). However, much before this time, state governments in Nigeria began to launch websites. Executive governance in Nigeria is by three tiers – Federal, State and Local.

According to (Daily Champion Newspapers, 2004) Bayelsa, a state government in Nigeria had taken steps to enthrone electronic government (e-government), among other activities in the state, by launching its official website - www.bayelsagov.com., that of Lagos State, Nigeria, Land policy and management in Nigeria with particular reference to Lagos State of Nigeria, the socio-economic importance of land to citizen and the state, administrative and bureaucratic bottlenecks in smooth administration, documentation, and perfection of land business in Lagos State have also being tackled by e-governance. A major reason for embankment on e-government initiatives early on in its deployment in Nigeria was, according to Ikhemuemhe (2003), a determination to cut the bureaucracy that attended government business in the country. The Federal Government set to launch an e-government initiative which would take government transaction online.

According to Daily Sun Newspapers (2004), the Federal Government of Nigeria has a

National IT policy to bring the benefits of IT to all sectors, including, but not limited to, government, law and general development. An in-depth review shows that there does not appear to be any law in force permitting or denying electronic filings or forms/ documents. A UN e-government report of 2008 concludes that it appears such filings are very rare, if existent at all, in Nigeria. However, the government has set up the Nigerian Information Technology Development Agency (NITDA), a specialized agency for the realization of the National IT policy. The government is touted as having a formal e-government agenda. The supervising body of e-government in the country, NITDA, is currently under the Ministry of Technology, but a NITDA bill was presented to the National Assembly in November 2005, presumably to give NITDA independent legal authority (Ajayi, 2003) To complete NITDA, the Federal Government is also part of a Private-Public Partnership of a Tripartite Joint Venture registered as "National eGovernment Strategies Limited" (NeGSt), which is comprised of the government (5%), a consortium of banks (15%) and strategic partners (80%). The mandate of NeGSt is to create a practical strategy and single architecture to guide the evolution of digital government solutions with consistent standards (Institute for e-Government). Thereafter, a Computer Security and Critical Infrastructure Protection Act was proposed by the Nigerian Cybercrime Working Group (NCWG), a part of the Office of the National Security Adviser in Abuja (Ibekwe, 2008). Such law does not appear to be in force—it is not clear whether such law has even been submitted to the National Assembly.

From the aforementioned, there appears to be lots of legal and other loopholes in the e-government project in Nigeria. In summing this up, the Center for Democracy and Technology instructed the law firm of Weil, Gotshal & Manges on a pro-bono basis to survey publicly available information on the e- government policy and laws of 30 developing countries, in a report titled "Preliminary e-Government Policy, Law and Regulation Survey Report". This survey was intended to give a general overview of the e-government situation in Nigeria based on research from information available at the time of writing. The report largely finds that Nigeria does not have existing laws to manage e-government. The closest that Nigeria has to a regulatory document, is as relates to telecommunications, Nigeria, a law entitled the "Nigerian Communications Act, 2003, which calls for the Nigerian Communications Commission (NCC) to design a system which, amongst other things, shall promote the widespread availability and usage of network services and applications services throughout Nigeria by encouraging the installation of network facilities and the provision for network services and applications services to institutions and in un-served, underserved areas or for underserved groups within the community. The report finds that there is neither law regarding privacy protection of government records nor any laws permitting tenders for government contracts to be posted online, etc as found in other parts of the world.

Implications and Conclusion

From the above review of literature there are loopholes in the legal framework for e-government in Nigeria. Above all, there are limited academic writings on this subject with reference to Nigeria. Much of what exists are newspaper articles and speeches from top political leaders in the country. There is no literature on empirical findings on citizens' views, satisfaction and requirements for better e-government services. Pensioners from across the country still throng to Abuja, the country's capital, for manual verification exercises, etc that e-government in other countries take care of, and more. Even though at present some activities of government seem to include services such as use of ICT for payment of tax, immigration issues, procurement of online forms and e-registration and the like, there are no attendant policy drives, legal framework and direction. There is need for NITDA and other supervising authorities to assess the state

of e-government in the country. There is no doubt that the public service in Nigeria is still paper based and use of ICT in government very problematic and frustrating for citizens and public servants alike.

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Open Source Software for Creation of Digital Library: A Comparative Study of Greenstone Digital Library Software & DSpace

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Abstract:

Softwares now-a-days have become the life line of modern day organizations. Organizations cannot think of doing their tasks effectively and efficiently without softwares. The extremely competitive environment, zero deficiency and enhanced productivity has made it mandatory for the organizations to carefully choose the appropriate software after comprehensive needs assessment. Softwares simply their tasks and saves a lot of precious time which can be utilized in managing other important issues. Libraries also need softwares if they want to create a parallel digital library with features which we may not find in a traditional library. There are several open source softwares available to create a digital library. For this, firstly the library professionals should be aware of the advantages of open source software and should involve in their development. They should have basic knowledge about the selection, installation and maintenance. Open source software requires a greater degree of computing responsibility than commercial software. Digitization involves huge money to create and maintain and the OSS appears to be a means to reduce it. Among these, DSpace and Greenstone are becoming more popular in India and abroad. This paper deals with the comparison of these two popular OSS from various points of view. The comparative table may help the professionals who are planning to create a digital library.

Keywords: Open Source Software; Digital Library; Greenstone Digital Library (GSDL); DSpace.

Introduction

Libraries do not have huge amounts of money to experiment, and they don't usually purchase additional resources. The need for software, its installation, training and the lack of money available to spend on it have forced many libraries to stand for themselves when it comes to staying up to date with the latest technology. Unless, of course, they adopt the open source movement and use a few of them available to overcome these problems. Most software that we all use everyday is known as "proprietary", which means that it costs money and that the actual code of the software is restricted, in that the code of the software cannot be modified, copied, or changed from its original construction. The code is "unreadable" and pretty much is what it is. Open source software (OSS), on the other hand, is quite the opposite. The open source mentality revolves around sharing and collaboration, and these two important elements describe open source software perfectly. First and foremost, open source software is free for anyone to have; more importantly, not only is the software free, but it is also free for anyone to copy, hack, modify, etc. This increases the possibilities of a software program's potential because of this free-thinking model. There are many different kinds of open source software solutions out there today that could be embraced by the library. There's basic operating system, document processing programs, Library Management Software (LMS) and Digital Library software.

Open source software

Open source software is computer software whose source code is available under a license

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that permits users to study, change, and improve the software, and to redistribute it in modified or unmodified firm. It is often developed in a public, collaborative manner. It is the most prominent example of open source development and often compared to user generated content.

Advantages of Open Source Software

- The availability of the source code and the right to modify it is very important as enables in the improvement and extend the lifetime of a software product.
- Source code availability also makes it much easier to identify errors, and to fix them.
- The right to redistribute modifications and improvements to the code, and to reuse other open source code, permits all the advantages due to the modifiability of the software to be shared by large communities.
- Continuous improvement does not require users to pay for it. There is no single entity on which the future of the software depends. This is a very common concern with proprietary software.
- There are fewer conflicting priorities due to marketing pressures. Usually open source software is delivered "when it is ready", and when the development team feels that its quality is good enough. This means that software usually does not need as many "service packs", updates and such, reducing the maintenance cost.
- It provides a new forum for democratic action, collaboration, mutual benefit without geographical or any other barrier/ bias.
- It forces commercial software vendors to keep their product price at a reasonable level.

Digital Library Softwares

Digital libraries are defined in many ways, encompassing both analog material made available digitally and newly created digital content. It is an organized searchable collection in digital format. There are quite a few digital library software packages available in the market. One has to select the right kind of package depending on their specific need. There are a few library automation software packages, which have a separate 'digital library' module. Open source digital library software derives its strength from several enabling technology and metadata based inter operability protocols, which have become available recently. Examples of some of these are as follows:

Greenstone Digital Library

Greenstone is a suite of software for building and distributing digital library collections. It is not a digital library but a tool for building digital libraries. It provides a new way of organizing information and publishing it on the Internet in the form of a fully-searchable, metadata-driven digital library. It has been developed and distributed in cooperation with UNESCO and the Human Info NGO in Belgium. It is open-source, multilingual software, issued under the terms of the GNU General Public License. Its developers received the 2004 IFIP Namur award for "contributions to the awareness of social implications of information technology, and the need for an holistic approach in the use of information technology that takes account of social implications."

The aim of the Greenstone software is to empower users, particularly in universities, libraries, and other public service institutions, to build their own digital libraries. Digital libraries are radically reforming how information is disseminated and acquired in UNESCO's partner communities and institutions in the fields of education, science and culture around the world, and particularly in developing countries. This software is developed and distributed as an international cooperative effort established in August 2000 among three parties:

- New Zealand Digital Library Project At The University Of Waikato
- United Nations Educational, Scientific And Cultural Organization (Unesco)

The Human Info NGO, Based In Antwerp, Belgium

DSpace

DSpace is open source software for building and managing Digital repositories. Developed jointly by MIT Libraries and Hewlett-Packard (HP), is freely available to research institutions as an open source system that can be customized and extended. DSpace is a digital institutional repository that captures, stores, indexes, preserves, and redistributes content in digital formats. Institutional Repository is a set of services that a research institution/ organization/ university offers to the members of its community for the management and dissemination of digital materials created by the institution and its community members Typically, DSpace has been deployed for Institutional Repositories of publications, thesis and dissertations. There are several groups working on extending its capabilities such implementation of ontologies in search interface and for submission module, customization for management of electronic theses and dissertations and for localization and international of the package for the world languages. DSpace is designed for ease-of-use, with a web-based user interface that can be customized. The DSpace system provides a way to manage research materials and publications in a professionally maintained repository to give them greater visibility and accessibility over time.

Comparative Analysis

Both Greenstone and DSpace are considered effective software for building digital libraries. Both have a good number of successful installations. But there are some basic differences also that has been highlighted in the table given below. The objective of the present work, includes a comparative study of Greenstone and DSpace in order to understand their feasibility and effectiveness as tool for building sustainable digital libraries. Comparison between Greenstone and DSpace has been carried out on points like the availability, version, developer prestige, operating system, system requirement, license, language, technical and training support, examples, security, browse and search and other points which are necessary for comparative study. Greenstone emanates from the Department of Computer Science in the University of Waikato, New Zealand, and is developed and distributed in cooperation with UNESCO as part of its Information for All program. DSpace was conceived by Hewlett-Packard Labs as a noncommercial product, and has been developed in conjunction with MIT Libraries. Both systems have active open source developer communities.

Developers

Greenstone

Greenstone is produced by the New Zealand Digital Library Project at the University of Waikato, and developed and distributed in cooperation with UNESCO and the Human Info NGO. The aim of the Greenstone software is to empower users, particularly in universities, libraries, and other public service institutions, to build their own digital libraries. Digital libraries are radically reforming how information is disseminated and acquired in UNESCO's partner communities and institutions in the fields of education, science and culture around the world, and particularly in developing countries.

DSpace

The MIT Libraries and Hewlett-Packard (HP) jointly developed DSpace. The system is now freely available to research institutions world-wide as an open source system that can be customized and extended.

Feature	Greenstone	DSpcae
Developer	New Zealand Digital Library Project at the University of Waikato, UNESCO and Human Info NGO	MIT Libraries and Hewlett-Packard Company
Platform	Windows 95/98/Me/NT/2000/XP Unix/Linux, and MAC OS-X	Windows (NT/2000/XP) and All POSIX (Linux/BSD/UNIX-like OSes), OS X
Open Source and Free	Yes	Yes
License	GNU General Public License	BSD License
Language	English, French, Spanish, Russian and Kazakhs. The reader's interface is available in many other including Indian languages Bengali, etc	English
Associated Software	Apache Web server, Java 1.4.0 or above, Image Magick Software and Web Browser	Java JDK 5 or later Apache Ant 1.6.2 or later, Apache Maven 2.0.8 or later Java 1.4 or later, PostgreSQL 7.3 or later, Apache Tomcat 4.x/5.x and Web Browser
URL	http://www.greenstone.org/	http://www.DSpace.org/
Download	https://sourceforge.net/projects/greenstone/files/Binary Installer-Windows/ Greenstone-2.83-windows.exe/ download	http://sourceforge.net/projects/dspace/files/
Latest version	Greenstone 2.83	Space 1.6. 2
Metadata	Dublin Core (qualified and unqualified) RFC 1807 NZGLS (New Zealand Govt. Locator Service) AGLS (Australian Government Locator Service)	Dublin Core (qualified)
Protocols	OAI-PMH	OAI-PMH
Support:		
Documentation	Yes	Yes
WIKI	YES	YES
FAQ	YES	YES
MAILING LIST	YES	YES
Commercial Support	YES	YES
TRAINING	YES	YES
Supported File formats	MS-Word, PDF, HTML, PostScript, JPEG, GIF	MS-Word, PDF, PPTs, JPEG, GIF
Written in	Written in C++, Perl, & Java	Written in Java

Platform

Greenstone and DSpace both are available for Windows and Unix/Linux OS. The Windows version of Greenstone is available since long back, whereas the Windows version of DSpace has been released very recently. Though for Unix/Linux versions are more widely used for the production system, the Windows version encourages more number of users to try the softwares. Availability of these digital library softwares in both, Windows and OS-X, makes it immaterial for the institutions to choose any of them, from the operating system/platform point of view.

Open Source and Free

It is a matter of rejoice that both of them are free and open source. For such type of software a combined term 'F/OSS' or 'FOSS' is used. This means any institution interested in establishing a digital library will not be having financial burden on account of purchasing proprietary software. Open Source also guarantee continuous development on collaborative basis.

Licensee

Greenstone is available under GNU General Public License (GPL) whereas DSpace is available under BSD License. BSD licenses represent a family of permissive free software licenses. The licenses have few restrictions compared to the GNU General Public License or even the default restrictions provided by copyright, putting it relatively closer to the public domain. But as a end user of these digital library softwares, it does not pose any serious concern.

Language

Greenstone I available in multiple language pack including Indian languages like Hindi, Bengali, etc. DSpace is available in English only. For implementation at regional/local level, Greenstone may be good choice.

Associated Software

Greenstone requires Apache whereas for the installation of DSpace Apache Ant is needed. Apache Ant is actually a member of the Apache projects. Java 1.4 or later is required by both of them. For image handling, Greenstone prefers Image Magic software, which a image handling software. DSpace does not recommend any such image editing software. Any standard image editing software can work with these softwares. DSpace additionally requires PostgresSQL which is an open-source Object-Relational DBMS supporting almost all SQL and Apache Tomcat, that offers an environment for Java code to run in cooperation with a web server.

Metadata Standards

Metadata standards help in cross-domain information resource description. They also provides a simple and standardized set of conventions for describing things online in ways that make them easier to find. The metadata standards supported by Greenstone include: Dublin Core (qualified and unqualified), RFC 1807, NZGLS (New Zealand Government Locator Service), and AGLS (Australian Government Locator Service). DSpace supports Dublin Core qualified version.

Protocol

The OAI-Protocol for Metadata Harvesting (OAI-PMH) defines a mechanism for harvesting (gathering) records containing metadata (structured information about resources) from the digital libraries. Both Greenstone and DSpace follow OAI-PMH thus facilitating, metadata from many sources to be gathered together in one database, and services can be provided based on this centrally harvested, or "aggregated" data.

Support

Both Greenstone and DSpace offers comprehensive documentation for the

problem solving of the software users. The user support is provided in the form of documentation/ user manual/ guides; Wikis, FAQs, Mailing lists, training etc.

File format Supported

Both Greenstone and DSpace supports almost all of the standard formats including text, Image, audio, video etc.

Programming language

Greenstone has been written in C++, Perl, & Java. DSpace is written in Java.

Some other differences

Preservation

The act of creating any digital library collection based on open source software will contribute to the preservation of the material it contains. However, DSpace is explicitly oriented towards long-term preservation, while Greenstone is not. DSpace stores preservation metadata and includes a scheme where institutions commit to ensuring the continued availability of certain named formats.

Support infrastructure

DSpace is designed for institutional use, where there are centralized computing facilities and a competent infrastructure for software support. Greenstone is designed to be easy for anyone with basic computer-literacy skills to install, in a laptop, desktop, or institutional environment.

Author-oriented

DSpace incorporates an interface whereby users (typically authors, though some institutions choose to have librarians do this on behalf of the faculty) can submit documents to the system, and define metadata for them. Greenstone does not.

Librarian-oriented

Greenstone supplies an end-user interface with which collections can be designed, customized, and built. DSpace provides a generic design that can be tailored – but not by typical end users.

Distribution on removable media

Those who create Greenstone collections can write them to a self-installing CD-ROM that operates on all Windows systems (even obsolete ones right down to Windows 3.1/ 3.11, still in use in developing countries).

Dynamic collections (historically related to the above)

In Greenstone, adding documents to a collection normally involves rebuilding the full-text index and browsing structures (though rebuilding can be scheduled to take place automatically), whereas DSpace operates incrementally (though operations on recently-added documents like extracting text or producing image thumbnails are processed in batch mode).

International Users

Greenstone provides interfaces for readers in 40 languages, including many minority ones, and has a scheme that helps language maintainers keep the interfaces up to date when new interface features are added.

Both systems are continually evolving, and these features can change rapidly. For example, Greenstone can indeed accommodate dynamic collections by using a different search engine from the default one. Although this is probably beyond the technical capabilities of the librarian-level users that Greenstone targets, a user interface enhancement could easily rectify this. Conversely, although the default DSpace configuration is currently restricted to UNIX, it would not be hard to modify it for other operating systems. And there are some DSpace installations in languages other than English.

The difference between the two systems is largely explained by the environments in which they are designed to operate. DSpace is designed for the institutional setting, where members of faculty submit their documents to a common system that enforces common standards. Its model envisages "communities" (e.g., schools, departments, centers, labs, and programs) that contain one or more "collections" of digital "items". Greenstone is designed to allow non-specialist users to produce single, individualized, collections. Its model envisages a "librarian" who is creating collections from existing "resources" (comprising both "items" and metadata resources) and distributing them over the Web or on removable media, possibly in an international setting.

Conclusion

Digital libraries are a key technology for developing countries. They can assist human development by providing a non-commercial mechanism for distributing humanitarian information on topics such as health, agriculture, nutrition, hygiene, sanitation and water supply. Many other areas, ranging from disaster relief to medical education, also benefit from new methods of information distribution. Digital library can be created by using open source softwares available free of cost. Free and open-source software are not only "a useful and significant tool for the developing countries", but clearly have the potential to help democratization and help find solutions to the most pressing problems faced by the populations of developing countries. The growth of free, open-source software presents developing countries with an opportunity to escape from technological dependence on developed countries, but also a challenge to build up local expertise. The comparative study made in the present paper, which should help users to understand the differences and make an informed choice between the systems, indicates that both Greenstone and DSpace are appropriate softwares for creating digital libraries with minor variation in the features and workflows. While DSpace enjoys more installations worldwide and being considered for creating large and complicated digital libraries, Greenstone is known for its simplicity and easy to use librarian and user interface. Users sometimes wonder which one to adopt. In fact, the aims of the two are very different, although their domains of application do overlap. Of the many open source systems for digital libraries, two of the most prominent are Greenstone and DSpace. Greenstone is older and more established internationally; DSpace has a more impressive institutional pedigree. There exists a • gdigital Divide• h among the countries of the worlds because of the disparity of available ICT infrastructure. But with the gradual transformation of this condition and availability of free & open source softwares for creating digital libraries, institution/ government can bridge this digital divide effectively with minimum investment. Organization also need to take steps in the areas of knowledge management and digital preservation. All these issues and areas can be taken care of by digital library softwares. Greenstone and DSpace digital library softwares cab be used for serving the people, society, nation and the world at large.

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Collaborative Research Pattern of Andre Geim: a Scientometric Portrait

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Abstract

Scientometric analysis of the 184 publications by Andre Geim published during 1981 – 2010 has been done in the present paper. The result of the study shows that Andre Geim had published 2 single-authored and 182 multi-authored (publications) papers during 1981-2010. The multi-authored papers include: two-authored (11), three-authored (20), four-authored (24), five-authored (17), six-authored (22), seven-authored (36), eight-authored (23), nine-authored (10), ten-authored (4), eleven-authored (11), twelve-authored (2), and thirteen-authored (2). His highest productivity was in 1994 with the output of 19 publications (age 36), followed by 16 publications in 2008 (age 50). The 50 percentile productivity life was 15 at the age of 37 years. The total productivity life of the author spans 30 years from the age 23. Andre Geim has received 12189 citations for his 184 articles and his h-index 50.

Keywords: Scientometric Portrait; Scientometrics; Publication Productivity; Research Collaboration.

Introduction

Scientometric portrait studies deal with mathematical and statistical study of individual career of scientists and researchers, and correlating bibliographical analysis of publications, academic and scientific achievements. According to Sangam et al [1], scientometric portrait study has received much attention in the recent years by proving to be of great value to the concerned scientists by highlighting various aspects of their career, such as productivity according to biological age, collaborative pattern, authorship and other characteristics. Bio-bibliometrics is a term that was first coined by Sen and Gan [2] to mean the quantitative and analytical method for discovering and establishing functional relationships between bio-data and biblio-data elements. Kademani and Kalyane [3-4] were the first to use the phrase "Scientometric portrait" to carry out bio-bibliometric studies on scientists including Nobel laureates [5].

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In the present paper, an attempt has been made to investigate the scientific work done by the Nobel Laureate of 2010, Andre Geim (Russia) and his role for the advancement of science and technology in the world.

Andre Geim was born to Konstantin Alekseyevich Geim and Nina Nikolayevna Bayer on October 1, 1958. Both his parents were Russian-German engineers. In 1965, the family moved to Nalchik, where he studied at an English-language high school. After graduation, he applied to the Moscow Engineering Physics Institute. He took the entrance exams twice but was not accepted. He then applied to the Moscow Institute of Physics and Technology (MIPT) where he was accepted. He received an MSc in 1982, and in 1987 obtained a PhD in Metal Physics from the Institute of Solid State Physics (ISSP) at the Russian Academy of Sciences (RAS) in Chernogolovka. He said that at the time he would not have chosen to study solid-state physics, preferring particle physics or astrophysics, but is now happy with his choice. He got the Nobel Prize in Physics (2010) for study of graphene [6].

Aims and objectives

The main aim of the present paper is to give a scientometric portrait of Andre Geim.

The objectives of the paper are as follows:

1. To investigate the number of articles contributed by the author
2. To study the publication productivity and authorship pattern
3. To calculate the h-index and the number of citations received by Andre Geim.

Data and methodology

Scientific publications seem to provide the best available basis for measuring the research output. The data source for the study was *ISI Web of Science, Science Citation Index*, published by Thomson Scientific. It is the world's leading abstracting & indexing service providing on all aspects of science. By using suitable strategy related to literature produced by Nobel Laureate Andre Geim (Russia), the bibliographic details for each record including author, title, citation, h-index and country of input were collected. Collected data was analyzed according to the objectives of the study.

Table 1: Publication productivity of Andre Geim in chronological order

APL	Year	Single & multi - authored papers													MT	TP	AA
		1	2	3	4	5	6	7	8	9	10	11	12	13			
1	1981	-	1	-	-	-	-	-	-	-	-	-	-	-	1	1	23
2	1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24
3	1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25
4	1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26
5	1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	27
6	1986	-	-	2	-	-	-	-	-	-	-	-	-	-	2	2	28
7	1987	-	-	-	1	-	-	-	-	-	-	-	-	-	1	1	29
8	1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30
9	1989	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1	31
10	1990	-	-	2	-	-	-	-	-	-	-	-	-	-	2	2	32
11	1991	-	-	-	-	-	-	1	-	-	-	-	-	-	1	1	33
12	1992	-	1	3	3	1	1	1	-	-	-	-	-	-	10	10	34
13	1993	-	-	-	2	3	2	-	-	-	-	-	-	-	7	7	35
14	1994	-	-	2	3	-	1	4	5	1	1	2	-	-	19	19	36
15	1995	-	-	-	-	-	1	1	1	-	-	-	-	-	3	3	37
16	1996	-	-	-	2	1	1	5	-	2	-	2	-	-	13	13	38
17	1997	-	-	1	2	-	2	3	1	-	-	-	-	-	9	9	39
18	1998	-	-	-	-	1	1	1	3	-	-	-	-	-	6	6	40
19	1999	-	1	-	1	1	-	1	-	-	-	-	-	-	4	4	41
20	2000	-	1	-	-	-	3	1	1	1	-	1	-	-	8	8	42
21	2001	-	1	3	-	-	1	-	-	-	-	-	-	-	5	5	43
22	2002	-	-	-	1	1	2	-	-	-	-	-	-	-	4	4	44
23	2003	-	-	-	2	1	1	1	-	-	-	-	-	-	5	5	45
24	2004	-	-	-	1	1	1	-	2	-	-	-	-	-	5	5	46
25	2005	-	-	1	1	-	2	3	1	-	-	-	-	-	8	8	47
26	2006	-	-	2	-	1	-	1	-	2	-	1	-	-	7	7	48
27	2007	-	3	-	1	2	2	2	2	1	1	-	-	1	15	15	49
28	2008	-	3	2	-	1	2	3	2	-	-	2	1	-	16	16	50
29	2009	1	-	1	-	2	-	4	2	1	2	2	-	1	15	16	51
30	2010	-	-	1	2	1	1	4	3	2	-	1	1	-	16	16	52
	Total	**2**	**11**	**20**	**22**	**17**	**24**	**36**	**23**	**10**	**4**	**11**	**2**	**2**	**182**	**184**	

APL- Age of productive life; MT- Total of multi-authored publications; TP- Total publications; AA-Biological age of the author

Andre Geim had 2 single-authored and 182 multi-authored publications during 1981-2010. The multi-authored publications include: two-authored (11), three-authored (20), four-authored (24), five-authored (17), six-authored (22), seven-authored (36), eight-authored (23), nine-authored (10), ten-authored (4), eleven-authored (11), twelve-authored (2), and thirteen-authored (2). The above table shows that the first paper of the author was published in 1981 when he was 23. Andre Geim had no publications during 1982, 1983, 1984, 1985 and 1988. His highest productivity was in 1994 with the output of 19 publications (age 36), followed by 16 publications in 2008 (age 50). The 50 percentile productivity life was 15 at the age of 37 years. The total productivity life of the author spans 30 years from the age 23.

Andre Geim had 2 single-authored publications in the domain of Physics (Applied Physics) & Engineering and remaining multi-authored publications in various domains as Physics – Applied Physics & Optics (134), Material Science, Nano Science & Nanotechnology (21), and Engineering, & Multidisciplinary Sciences (29). Year-wise productivity of Andre Geim is shown in Table 1.

Table 3 indicates that Andre Geim has received 12189 citations for his 184 articles and his h-index 50.

Table 2: Publication productivity and authorship patterns of Andre Geim in various scientific domains

No. of authors	Domains				Total no. of papers	%	Total no. of authorship	%
	A	B	C	D				
1 - Author	1	-	1	-	2	1.08	2	0.17
2 - Authors	7	-	4	-	11	5.97	22	1.94
3 - Authors	20	-	-	-	20	10.86	60	5.29
4 - Authors	22	1	1	-	24	13.04	96	8.46
5 - Authors	9	2	6	-	17	9.23	85	7.49
6 - Authors	13	5	4	-	22	11.95	132	11.64
7 - Authors	29	3	4	-	36	19.56	252	22.22
8 - Authors	18	1	4	-	23	12.5	184	16.22
9 - Authors	6	3	1	-	10	5.43	90	7.93
10 - Authors	2	-	2	-	4	2.17	40	3.52
11 - Authors	5	4	2	-	11	5.97	121	10.67
12 - Authors	-	2	-	-	2	1.08	24	2.11
13 - Authors	2	-	-	-	2	1.08	26	2.29
Total	**134**	**21**	**29**	**0**	**184**	**100**	**1134**	**100**

A= Physics – Applied Physics & Optics; B= Material Science, Nano Science & Nanotechnology; C= Engineering, & Multidisciplinary Sciences; D= Miscellaneous

Table 3: Authorship pattern and collaborative measures

Nobel Laureate	Authorship pattern & collaborative measures						
	1	2	3	4 & >	Citations	h-Index	TP
Andre Geim	2	11	20	151	12189	50	184

1= Single author; 2= Two author; 3= Three author; 4=4& above author

Conclusion

Scientometric study plays an important role in the dissemination of particular scientists whose interest lies in the number of important papers he or she published. The above study on Andre Geim undoubtedly proves the usefulness of his work to the field of science and technology and gives inspiration to young scientists throughout the world.

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Research Productivity and Author Collaboration of Cardiology Research

C.Baskaran*, M. Sadik Batcha**

Abstract

The study presents the field of Cardiology literature records retrieved form MEDLINE database for the period 1991-2010. This research shows that maximum number of records 829 was during 2000, followed by 826 in 2003 and 789 in 2002. Relative Growth Rate (RGR) and Doubling Time (Dt) was found to be an increasing and decreasing trend shown during the period of study. The paper reveals a study of the authorship pattern and collaborative research in the field of Cardiology. The degree of collaboration mean score is 0.70 and highest score is 0.88 in 1991 exhibits during the period of study.

Keywords/Descriptors: Cardiology; MEDLINE; Relative Growth Rate (RGR); Doubling time (Dt); Degree of collaboration

Introduction

Bibliometrics is a quantitative study of written communication and it is essential for the effective management of libraries within their budget provisions. The quantitative data is used to keep control over the cost of library collection and essential books and periodical collections that satisfy the needs of the readers. The major focus of the study is to apply the bibliometric analysis with a view to analyze the performance of research output in Cardiology Literature. It aims to examine the emergence of research areas, research groups and countries with a view to map the cognitive or intellectual structure of research. Further, this study spells out the relation ship between authors, institutions, journals and articles and other means of insisting the peer review procedure King (1973). Bibliometric studies prove that bibliometric indicators play an important role in the policy decisions and in evaluation of research performance. It is observed that there is considerable evidence that bibliometric indicators play an important role in the evaluation of research Performance of individual scientists and research groups Maria and Ervin (1963).

Price (1963) on the basis of survey of Chemical Abstracts, observed a steady trend towards multiple authorship and thereby holding that if it continues at the present rate, by 1980 the single author papers will be extinct. Though the above postulation may not hold true a decline in the number of scientific papers published by single author evident. Bibliometric analysis of diabetes literature indexed the MEDLINE database for the period 1995-2004 shows that maximum number of records (13244) was during 2003, followed by 12690 in 2002 and 11061 in 2001. Relative Growth Rate (RGR) was found to be decreasing year wise. The doubling time (Dt) was found to increase every year. Ranking of the journals based on the quantum of research output on diabetes during 1995-2004 shows that USA in the largest contributor of literature on diabetes research. Mahapatra and Das Bhagwan (2000) have analyzed the derive nature of growth of literature in Geology during 1987 to 1996, type of collaboration among authors and the trend of growth during this period, degree of collaboration among various categories of authors,

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correlation of the growth of various categories of authors and impact of collaboration on growth of literature. From the study of five very old journals of Geology it was noticed that the increase in collaboration and simultaneously decrease in the amount of publication verifies that subject Geology is a quite a fully developed field of study. It is therefore, concluded that in a highly developed field, although the number of collaborative publications are more, the rate of growth of publications is low. Sangam and Keshava (2003) explained the growth of world Social Science literature in the six sub disciplines viz., Anthropology, Economics, History, Psychology, Political Science and Sociology were derived from the CD-Rom version of the Wilson Social Science Abstracts for the period 1983–1998. Determines the rate of growth of the Social Science literature by calculating relative growth rates and doubling time for publications. Fits both modified exponential curve and logistic curve for the original publications. Study the criteria on which growth models are to be selected for their possible application in the six sub disciplines of Social Sciences. Ezhilrani et al. (2008) An Investigation was made on the authorship pattern in Aquaculture Journals, based on the data collected from Aquatic Sciences and Fisheries Abstracts Part I (ASFA I) for a period of 3 years i.e. 1991, 1996 and 2001. In all the years, multiple authored contributions were more than that of single authors in all broad areas of aquaculture as the values of contributions of multiple authors ranged from 57.1% to 90.8% in different aspects of Aquaculture. The degree of collaboration was found to be 0.85 for all the three years and it ranged from 0.83 (1991) to 0.86 (1996 and 2001). The research productivity of diabetes conforms to Bradford's Law of scattering Krishnamoorthy et al.(2009). Studies related to authorship trend and collaborative researches are considered an important fact of modern science. The paper presents a study of the authorship pattern and collaborative research in the field of psychology.. Zafruninnsha et al. (2009) explains the degree of collaboration in psychology is 0.53. USA defences first by producing 42.28% of cited journals. Majority of the cited journals of psychology (95.54) are in English languages.

Objectives of the study

The specific objectives of the present study are to determine the,

1. To study growth of literature in the field of Cardiology
2. To analyses Relative Growth Rate (RGR) and Doubling Time (DT) of cardiology literature over the study period
3. To measure single Vs multi-authored papers in this study
4. To observe degree of collaboration of authors in Cardiology

Methodology

The records of published during 1991-2010, the data were retrieved in the field of cardiology which are covered in the MEDLINE CD ROM database was searched the bibliographic details like author, title, publication type, language, year, address of the contributors, country of publication, source etc. were colleted. The retrieved records were converted into visual FoxPro and loaded in SPSS for the purpose of analysis. The data was also analysed with the toolbox named as Bibexcel developed by Olle Pearson, Inforsk, Umea Univ (Sweeden). Relative Growth Rate (RGR) and doubling time (Dt) of Cardiology in particularly records recovered in G8 countries. It is also identify the author affiliation of these records for observing the authorship pattern and degree of collaboration which extracting the number of records available in the MEDLINE database.

Analysis

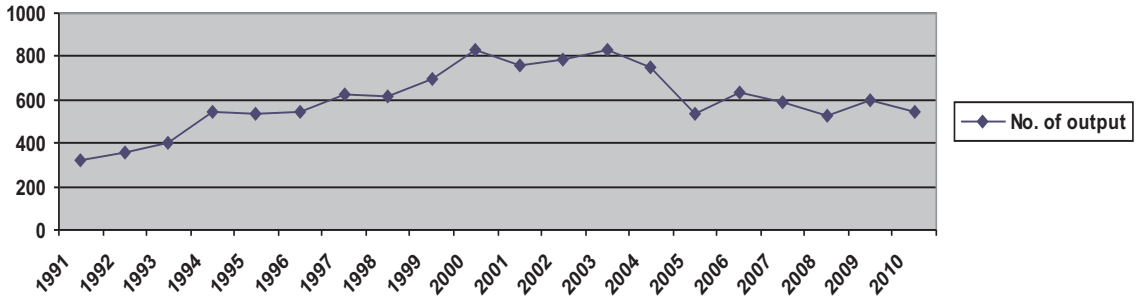
Quantum of Cardiology research productivity

The Cardiology research productivity includes in MEDLINE for the period 1991 to

Table 1: Quantum of Cardiology research productivity in G8 Countries

Year	No.of output	Percent	Cumulative
1991	318	2.64	318
1992	357	2.97	675
1993	402	3.37	1077
1994	542	4.51	1619
1995	534	4.44	2153
1996	547	4.55	2700
1997	624	5.19	3324
1998	619	5.15	3943
1999	692	5.75	4635
2000	829	6.89	5464
2001	757	6.3	6221
2002	789	6.56	7010
2003	826	6.87	7836
2004	753	6.26	8589
2005	532	4.42	9121
2006	638	5.31	9759
2007	587	4.88	10346
2008	524	4.36	10870
2009	602	5.01	11472
2010	543	4.51	12015
Total	**12015**	**100**	

Fig 1: Quantum of Cardiology research productivity



2010 databases of Cardiology literature is shown in Table 1. Total of 12015 records are covered in the database. It is found that the maximum number of records 829 was published during 2000, followed by 826 in 2003 and 789 in 2002.On the whole, it is noticed that from 1991 onwards there is a gradual increase and quietly decreased and increased trend from 2004 to 2010 (Figure 1)
.

Relative Growth Rate (RGR)

The Relative Growth Rate (RGR) is the increase in number of articles/ pages per unit of time. This definition is derived from the definition of relative growth rates in the study of growth analysis of individual plants and effectively applied in the field of Botany Hunt (1919), Blackman (1919) defined, which in turn had its origin from the study of the rate of interest in the financial investment. The mean Relative Growth rate (R) over the specific period of interval can be calculated from the following equation.

$$R_{1-2} = \log_e W_2 - \log_e W_1$$

Whereas

R_{1-2} = *mean relative growth rate over the specific period of interval*

$\log_e W_1$ = *log of initial number of articles*

$\log_e W_2$ = *log of final number of articles after a specific period of interval*

$T_2 - T_1$ = *the unit difference between the initial time and final time*

The year can be taken here as the unit of time. The RGR for articles is hereby circulated.

Therefore

1-2 (aa-1 year-1) can represent the mean relative growth rate per unit of year over a specific period of interval.

Doubling Time (Dt)

There exists a direct equivalence between the relative growth rate and the doubling time. If the number of articles/ pages of subject double during a given period then the difference the logarithms of numbers at the beginning and end of this period must be logarithms of number 2. If natural logarithm is used this difference has a value of 0.693. Thus the corresponding doubling time for each specific period of interval and for both articles and pages can be calculated by the formula,

$$\text{Doubling time (Dt)} = \frac{0.693}{1\text{-}2\ R\ (\text{aa-1 year -1})}$$

Therefore,

$$\text{Doubling time} = \frac{0.693}{R}$$

and

$$\text{Doubling time for pages Dt (p)} = \frac{0.693}{1\text{-}2\ R\ (\text{aa-1 year -1})}$$

Relative growth rate (RGR) and Doubling time (Dt)

It is seen from Table 2 that RGR has been decreasing from 1991 (0.10) to 2010 (0.09). On the other hand, the doubling time (Dt) has shown decreasing and decreasing trend. The data in table 2 reveals that doubling time has increased form 0.69 in the year 1991 to 6.93 in the year 1995.

Table 2: RGR and Dt for Cardiology research Output

Year	No. of Output	Cumulative	W1	W2	RGR	Doubling time (Dt)
1991	318	318		5.76		
1992	357	675	5.76	5.87	0.11	6.3
1993	402	1077	5.87	5.99	0.12	0.57
1994	542	1619	5.99	6.29	0.3	2.31
1995	534	2153	6.29	6.28	0.01	69.3
1996	547	2700	6.28	6.30	0.02	34.65
1997	624	3324	6.30	6.43	0.13	5.33
1998	619	3943	6.43	6.42	0.01	69.3
1999	692	4635	6.42	6.53	0.11	6.3
2000	829	5464	6.53	6.72	0.19	3.64
2001	757	6221	6.72	6.62	0.1	69.3
2002	789	7010	6.62	6.67	0.05	13.86
2003	826	7836	6.67	6.71	0.04	17.32
2004	753	8589	6.71	6.62	0.09	7.7
2005	532	9121	6.62	6.27	0.35	1.98
2006	638	9759	6.27	6.45	0.18	3.85
2007	587	10346	6.45	6.37	0.08	8.66
2008	524	10870	6.37	6.26	0.11	6.3
2009	602	11472	6.26	6.02	0.24	2.88
2010	543	12015	6.02	6.29	0.27	2.56

Single Vs multiple authorship pattern

Table 3 highlights the analysis of single Vs multiple authored pattern of Cardiology research productivity as observed in this study. The analysis reveals that the multi authored papers account for more than 40.14 percent of single authored papers during the period of study. It can be showed that there is an increasing trend towards multiple authored. It can inferred from the analysis that cardiologists more attention with team research. It can be seen that maximum number of papers are two authored and there is a decreasing trend in the number of authors in team of research as depicted in Fig 2.

Table3: Single Vs. multiple authorship in Cardiology research productivity

Year	Single authored	Multi authored	Total no. of output	percent
1991	35	283	318	2.64
1992	72	285	357	2.97
1993	174	228	402	3.34
1994	212	330	542	4.53
1995	217	317	534	4.44
1996	186	361	547	4.55
1997	162	462	624	5.19
1998	89	530	619	5.19
1999	264	428	692	5.78
2000	239	590	829	6.89
2001	268	489	757	6.32
2002	278	511	789	6.51
2003	294	534	826	6.87
2004	229	532	753	6.26
2005	198	334	532	4.42
2006	224	414	638	5.33
2007	140	447	587	4.88
2008	112	412	524	4.36
2009	106	496	602	5.02
2010	98	445	543	4.51
Total	**3597**	**8418**	**12015**	**100**

Degree of Author collaboration co-efficient

Subramanyam (1982) proposed a mathematical formula for calculating author's degree of collaboration in a discipline. The degree of collaboration among authors is the ratio of the number of multi-authored papers published to the total number of papers published in a discipline during certain period of time. The degree of collaboration coefficient among authors is measured mathematically as,

$$C = \frac{N_m}{N_m + N_s}$$

Where, c= degree of collaboration

N_m = *number of multi authored papers*

N_s = *number of single authored papers*

The degree of collaboration in different years is calculated as per the equation proposed by Subramaniam and it's presented in the Table 4. The degree of collaboration over the years from 1991-2010 is calculated and it varies from 0.56 to 0.88 the mean value is found to be 0.70.It has been shown increasing and decreasing trend on author collaboration in Fig 3.

Fig 2: Single Vs. multiple authorship in Cardiology research productivity

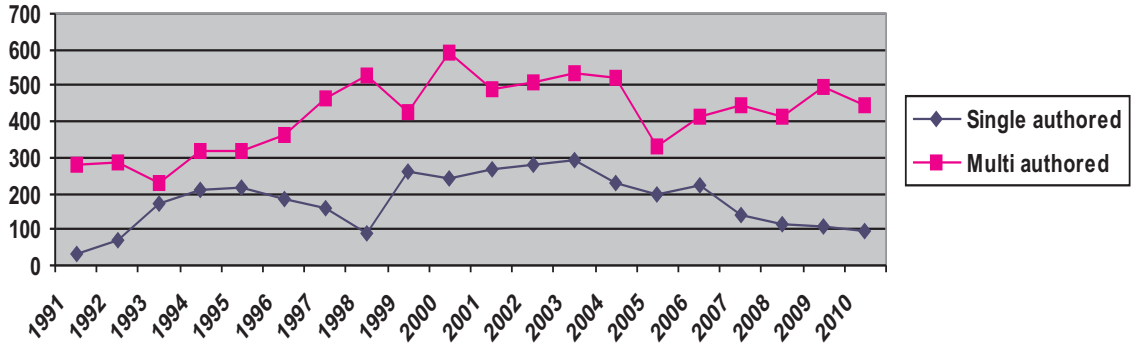
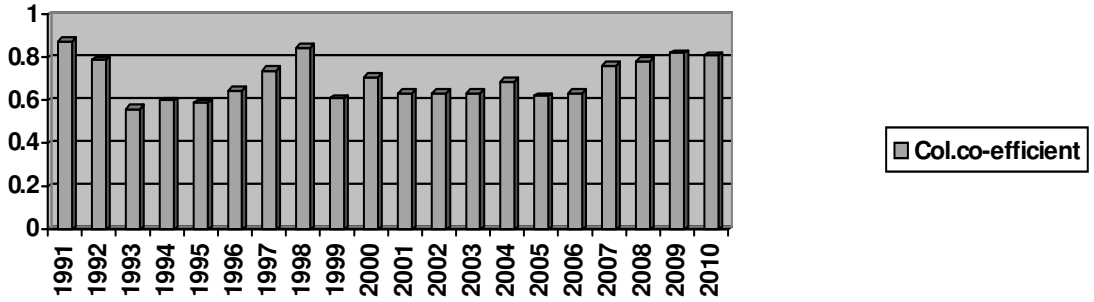


Table 4- Degree of author collaboration

Year	Single Authored (NS)	Percent	Multi authored (Nm)	Percent	Total no. of papers (NS+Nm)	Degree of collaboration Nm C=--------- Ns+Nm
1991	35	0.97	283	3.36	318	0.88
1992	72	2	285	3.38	357	0.79
1993	174	4.83	228	2.7	402	0.56
1994	212	5.89	330	3.92	542	0.60
1995	217	6.03	317	3.76	534	0.59
1996	186	5.17	361	4.28	547	0.65
1997	162	4.5	462	5.48	624	0.74
1998	89	2.47	530	6.29	619	0.85
1999	264	7.33	428	5.08	692	0.61
2000	239	6.64	590	7	829	0.71
2001	268	7.33	489	5.8	789	0.64
2002	278	7.72	511	6.07	789	0.64
2003	294	8.17	532	6.31	826	0.64
2004	229	6.36	524	6.22	753	0.69
2005	198	5.5	334	3.96	532	0.62
2006	224	6.22	414	4.91	638	0.64
2007	40	3.89	447	5.31	587	0.76
2008	112	3.11	412	4.89	524	0.78
2009	106	2.94	496	5.89	602	0.82
2010	98	2.72	445	5.28	543	0.81
Total	**597**	**29.93**	**8418**	**70.07**	**12015**	**0.70**

Fig 3- Degree of collaboration of G8 cardiology publication



Conclusion

This study investigates the degree of author collaboration in the Cardiology literature at G8 counties level. The study reflects a considerable upward trend seen from 1991-2000 in collaborative cardiology research output. It is confined that this study indicates towards collaborative research. The data suggests that there was significant research trend in the field of cardiology research during the study period. It could be observed highest score of Relative Growth Rate (RGR) is 0.35 and Doubling Time (Dt) is 69.3 were found during the study period. It has been observed multi authored papers account for more than 40.14 percent of single authored papers during the period of study.

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Awareness of Information and Computer Literacy among Teachers: A Case Study

Veena Kamble

Abstract:

A study was conducted in Dr. Babasaheb Ambedkar Marathwada Universtiy Academic staff College, Aurangabad to know information and computer literacy of the participant teachers of 88th orientation course. Questionnaire was used as a data collection tool. The response rate was 88.46%. The study revealed that the purpose of information need, importance of formal and informal information sources to teaching and research capability to use computer; skills of multimedia, internet / web, email, etc.

Key Words: Dr. Babasaheb Ambedkar Marathwada University; Academic Staff College; Information literacy computer literacy; formal Information sources; Electronic Information sources; internet; web; UGC; libraries.

Introduction

The information society calls for all people to become information literate which means that they should not only be able to recognize when information is needed but also be able to identify, locate, evaluate and use effectively information needed for decision making or fulfilling different goods.

Information technology, in particular the Internet and the web, have introduced a new society where people can share information freely, anywhere, at anytime, across the globe. Information networks have become an essential element of our lives and the global economy. With widespread use of the Internet, it becomes clear that skills required are not merely how to use computers or how to get information, but rather how to solve problems and how to create values with the help of others through information networks. Therefore,

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The term information literacy means more than so-called computer literacy.

21th century literacy is information literacy. Information literacy means being information smart. Knowing how to make critical judgment about information.

Information Literacy

The term 'Information Literacy' started flashing on the horizon of information sciences in early 1970s and continued to be defined and refined till 1989 when the implementation phase of information literacy programmes and standards began. Implementation was rather slow during the next decade, particularly in the case of higher education where information literacy competency standards were finally accepted in 2000. In the last two decades, information literacy has become a global issue and many information literacy initiatives have been documented throughout the world with particularly strong efforts and examples in North America, Australia, South Africa and Northern Europe. The programmes, which have been documented, address many concerns relating to technology and information skills.

According to ALA Presidential committee (1989) Information literacy in an

understanding and set of abilities requiring individuals to recognize when information is needed, have the ability to locate, evaluate, use effectively the needed information and create information within cultural and social context.

Ghosh,S.B. and Das,A.K. stated that information literacy is required for effective use, consumption and assessment of information resources available in the institutions. Exploring various initiatives in India that address information literacy in maximizing the utilization of knowledge resources, the study focuses on efforts by various institutions starting from elementary level to higher education level, professional societies and other organizations. It concludes that number of initiatives have been planned and implemented in this regard. In case of institutions of higher learning, bibliographic instructions programmes are there in universities. The research degree programmes have a course on research methodology and library search techniques are also included in this course. Some universities and institutes subscribe to e-resources and user training programmes are conducted for their use. Similarly there are user's orientation programmes imparting information literacy competencies.

Information literacy in not the same as computer literacy (which requires a technological know-how to manipulate computer hardware and software) although there in strong relationship among these concepts.

Computer Literacy

Computer literacy in defined as the knowledge and ability to use computers and technology effectively and efficiently. Computer literacy can also refer to the comfort level some has with using computer programs and other applications that are associated with computers.

Jones and Bartett publishers, stated very specifically in their book, chapter no.1. What are Literacy, Computer Literacy and Information Literacy?

Literacy – Literacy means the ability to locate and use printed and written information to make decisions and to function in society, both personally and professionally.

Computer Literacy – Add "Computer" to the term "Literacy" and it refers to the ability to use the computer to do practical tasks. A variety of viewpoints exists that identify computer skills required for computer literacy, but there is general agreement that computer literacy includes the ability to use basic computer applications to complete tasks.

Information Literacy – This term describes a set of skill that enable a person to identify an information need, locate and access the required information many time by using technology, evaluate the information found and communicate and use that information effectively. With the explosion of information, both good and bad, information literacy has taken on a major role in all educational settings.

Importance of information literacy and computer literacy in higher education

Solution to the Data Smog

Information and computer literacy is the solution to smog. It allows us cope be giving us the skills to know when we need information and where to locate in effectively and efficiently.

Supporting a users to achieve a range of skills an self directed learning

Information the field of education in general learning environment, where teachers are more responsible and autonomous in their learning.

UGC academic staff college Dr. Baba Saheb Ambedkar Marathwada University, Aurangabad.

The UGC established the academic staff college in Dr.Babasaheb Ambedkar

Marathwada University in October, 1987. The academic staff college in this University organized specially designed orientation courses with the objectives of improving the teachers understanding about social problems and seeking appropriate solutions, inculcating teaching skill, and developing them into vibrant and integrated personalities.

Objectives of the Study

The objectives of the study are -

1) To examine the orientation course participant teachers capability to use computer.
2) To know he teachers capability to use the internet.
3) To identify teachers, how to specify electronic information sources to solve specific information problems for students and our self information need.
4) To know the need to teachers about information literacy and computer literacy programmers in making them self learners and lifelong learners.

Research Methodology

Proposed study is a fact finding approach related to the present status of computer and information literacy among the participate teachers of orientation course .The survey method was adopted for the present study and a questionnaire was used for a date collection tool. The majority of the questions were objective type designed keeping.

Despite all these a total 46 filled in questionnaires were received back out of 52 distributed, thus having response rate of 88.46%.

It was found from the analysis of data that 71.73% very young teachers have participated in 88th he orientation course programme. (4th July -30th 2011).

Subject status

Analyses of the responses in field of higher Education are cattier major subjects of Academic Qualification.

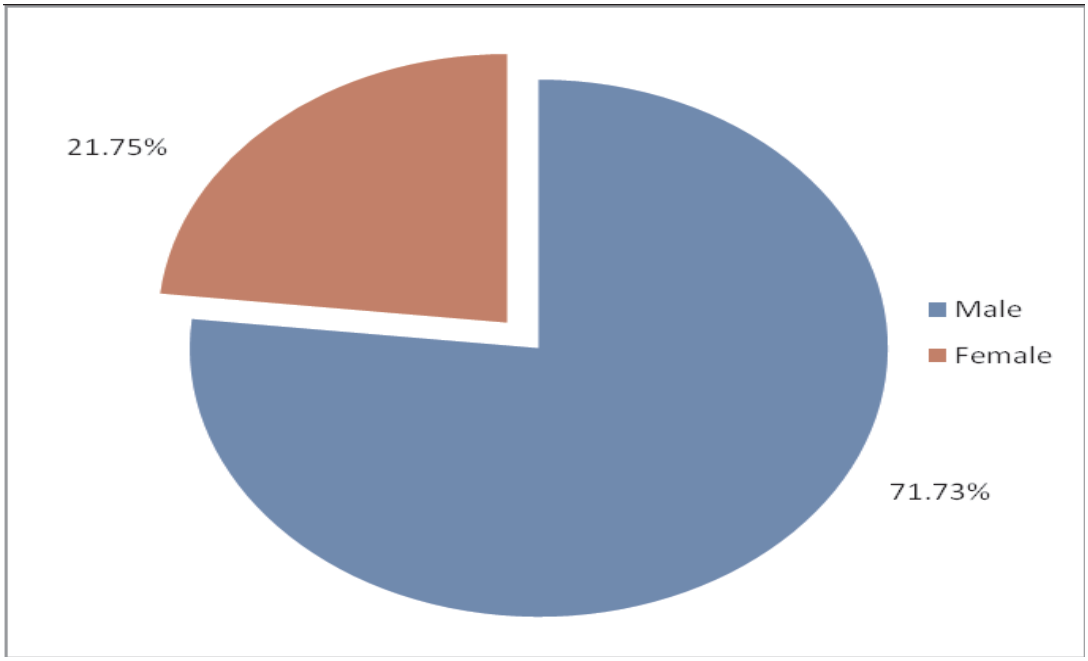
Table 1: Response Rate of O.C. Participant Teachers

Sr. No.	Sampling	No. of Questionnaire	Percentage
1.	Distributed Questionnaire	52	-
2.	Received Questionnaire	46	88.46%
3.	Not Respondent	06	11.54%
	Total		**100%**

Table No.2: Age Group

Sr. No.	Age Group	Response	Response in %
1	25-35	33	71.73%
2	36-45	10	21.75%
4	56-62	00	00%
	Total	**46**	**100.00%**

Pie chart



Following bar graph presents that the large majority as 56.52% have of M.A. teachers and followed by 28.26% teachers of M.sc.

Library science, M.Com and LLM Subject teachers compared to other subject is very less. Their percentage is 6.52%, 6.52% and 2.17% respectively.

Purpose of Information Need

Majority of the population was found the purpose of Information need. 39 (84.78%) teachers soughing information for teaching, preparation of course work, preparation of research work and for fulfilling student's difficulties and their needs in table no.3

Bar Graph

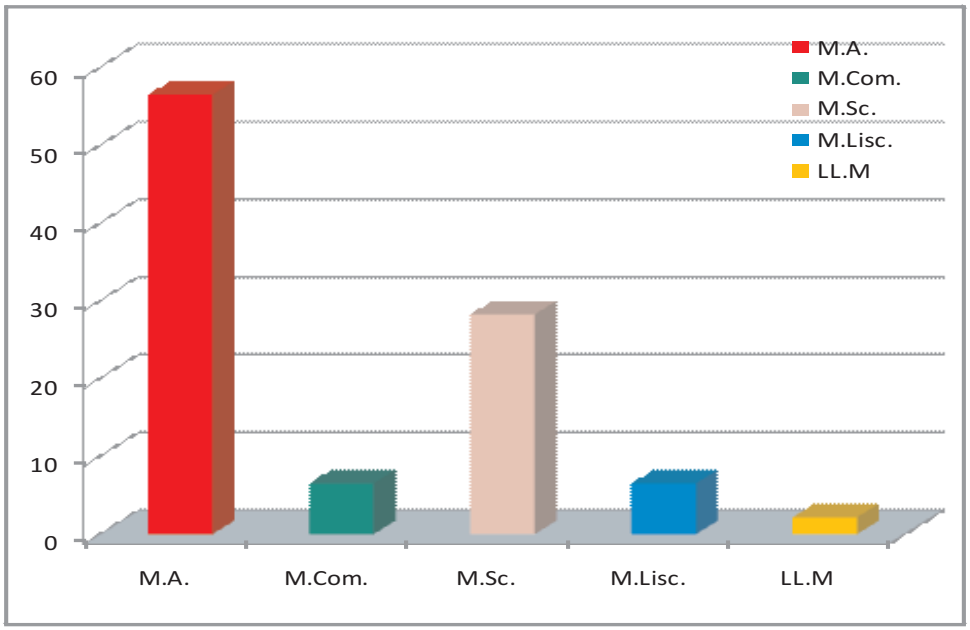


Table 3: Purpose of Information Needs

Sr. No.	Purpose of Information	No of Response	%
1	Teaching	2	4.35%
2	Research Paper	3	6.52%
3	Preparation of Course work	-	-
4	General Awareness	2	4.35%
5	Both o 1-5	39	84.78%

Table 4: Information Sources

Sr. No.	Purpose of Information	No of Response	%
	A. Formal Information Sources		
1	Reference Books	1st Rank 21	45.66%
2	Periodicals / Journals	2nd Rank 10	21.74%
3	Proceedings of Conference / Seminar / symposia	3rd Rank 7	15.22%
4	Technical Reports	4th Rank 5	10.86%
5	Bibliographies	5th Rank 3	6.52%
	B. Informal / Electronic Information / Sources.		
1	CD-ROM Database	1st Rank 20	43.48%
2	Internet	2nd Rank 17	36.96%
3	E-Journals / E - Books	3rd Rank 9	19.59%

Table 5: Basic Computer Operation and Concepts

Sr. No	Basic concepts of Computer	Yes		No	
1	Understanding CPU, Monitor, Printer, Disk.	46	100%	0	00%
2	Software Programs and navigate between programme	32	69.56%	14	30.44%
3	Create folders and access inf.	43	93.48%	3	6.52%
4	Save work to folders in the hard disk.	43	93.48%	3	6.52%

Importance of information sources teaching/ research

Orientation course participants were asked to indicate the type of formal and informal information sources which they used to seek information. Table No.4 Clearly reflects that references of seeking information are used heavily and get first preference

Periodical and Journals and proceeding of conference, seminars, symposia are used on second and their preferences, respectively, and seeking of informal or electronic sources, teachers are used mostly 43.48% CD-ROM database.

Teachers Capability to Use Computer

In order to use the information available in electronic from the teachers are expected to be computer literature which includes skill to operate computers, knowledge of hardware, software, and storage devices. The questions were realized to examine the computers literary of the teachers and the data is given in Table No. 5.

Table No. 5 reveals that 100% of the teachers know to operate computers and its basic concepts. 93.48% teachers, operate computer, through create folder, access information, save their works in the hard disk in day today life. 69.56% teachers aware with software programme and they work with the help of it for their research and course work.

Multimedia is the field concerned with the computer controlled integration of text, graphics, drawing still and represented, stored, transmitted and processed digitally.

Table 6: Multimedia Skills

Sr. No.	Basic concepts of computer	Yes		No	
1	Power point for presentation	42	91.30%	4	8.70%
2	Insert Graphics in Power point	38	32.60%	8	17.40%
3	Create and save word processing document	41	89.14%	5	10.86%
4	Upload files and document from web.	42	91.30%	4	8.70%

Table 7: Internet / Web Skills

Sr. No.	Basic concepts of computer	Yes		No	
1	Specific site on www. given a URL	41	89.14%	5	10.86%
2	Use of web browser to browser a web site	41	89.14%	5	10.86%
3	Use of search engine	43	93.48%	3	6.52%
4	Download and save text / graph / pdf files	43	93.48%	3	6.52%
5	Download and install such as acrobat reader and other software.	33	71.74%	13	28.26

It clearly depicts that 42 (91.30%) teachers have skill of PowerPoint presentation and upload files and document from web. And 41 (89.14%) participant have skill of create and save work processing document. Comparatively above skills. Graphical presentation skills have in only 38 (82.60%) teachers.

Internet is the network, has been considered as a powerful sources of information and if facilitates the navigators with maximum in available throughout the world. The teachers should know to use the internet for various, shall purpose including for finding the latest information needed for their studies, for communication with teachers and students as well as friends. A question was asked to those teachers who have said that they are using interment and the response rate shows in Table No. 7.

The data presented above table clearly indicates the that the majority 43 (93.48%) of the respondents posses the competence to use the internet and they know very well that in search engine, URL, browser specific web sites, and downloading graphs and pdf files etc.

Only 33 (71.74%) teachers updated with installation acrobat reader and such type of software.

Email Skills

E-mail allows you to send a message to anyone with access to the web. In addition, you can attach other files to the massage. In short E-mail is electronic messages. It is reliable, convenient, easy to use, instantaneous messaging system that helps us all keep in touch with each other.

In this table were given several questions belong o email. The teachers were asked to use of email in details. The data presented in table 8 reveals that the majority of the respondents have e-mail skills. 43 (93.48%) teachers aware of all details about e-mails and this is very appreciable thing for all teachers.

Table 8: E-mail Skills

Sr. No.	Basic concepts of computer	Yes		No	
1	Read email messages	43	93.48%	3	6.52%
2	Compose and send emails	43	93.48%	3	6.52%
3	Reply to all or to individual	43	93.48%	3	6.52%
4	Coping / Saving / Forwarding / deleting e-mails	43	93.48%	3	6.52%
5	Send and received attachment	43	93.48%	3	6.52%
6	Save and print a received attachment in an appropriate place.	43	93.48%	3	6.52%

Opinion

In order to elicit the teacher's opinion about the need of information and computer literacy. Majority teachers 36 (76.26%) access this electronic resources through their own computers (personal PC.)

Table No. 9 shows the only 16 (34.78%) teachers have using electronic sources in college library and rest of 14 (30.43%) teachers can prefer net café and departmental P.C.

Mostly feels that information and computer literacy in most needed. But they have not such

Table 9: Access of Electronic Resources

Sr. No.	Basic concepts of computer	No. of Responses	%
1	Home (Personal) P.C.	36	78.26%
2	Departmental	14	30.43%
3	College Library	16	34.78%
4	Other Place (NET	14	30.43%

type of resources for accessing, day-today life. They manage for that on their personal level lack of electronic resources is in most of the colleges.

Findings and Suggestions

Based on the analysis of data, the following finding and suggestions are made.

1) Majority of the responses i.e. 21 (45.66%) first preferred references books for the purpose of teaching. And for electronic information sources preferred on first CD Rom database.
2) Majority of the total respondents 46 (100%) have basic concepts of computer operation.
3) 42 Responses have awareness of multimedia skills of computer.
4) Only 3-5 teachers are not aware of the internet and web skills and they have lack of information about electronic mail also.
5) Mostly respondents opine that information and computer literacy are most needed. They recommended this appropriate information and electronic resources, can make available in library or in every department by college authorities.

In the present study author finding that the information and computer literacy rate of the teachers are very satisfactory. But the teachers have not getting such type of electronic resources and computer services for performance of their skills at work place.

Thus, in order to improve the situation and make the teachers and students sustainable in the growing higher education system following suggestion put forth.

The UGC and university have to take steps to impart information and computer literacy among teachers and students engaged in higher education. There is need to develop electronic resources infrastructure in colleges. College library should be applied for computerization of library. Through the library also teachers, students can get appropriate information in formal and informal way.

Conclusion

The study reveals that the awareness of information and computer literacy among 88th orientation course participant teachers during 4th July to 30th July 2011. The, ability to assess, evaluate and use information is a prerequisite for lifelong learning and education. Whenever it comes from the internet, the library or any other sources, the most important thing is the capability to use them to present their knowledge effectively. This study helps the librarians also for planning and developing electronic information sources in providing modern services to their library users.

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[1] Flink H, Tegelberg Å, Thörn M, Lagerlöf F. Effect of oral iron supplementation on unstimulated salivary flow rate: A randomized, double-blind, placebo-controlled trial. J Oral Pathol Med 2006;35:540-7.

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Corporate (collective) author

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