
International Journal of Advanced Multidisciplinary Research (IJAMR)

ISSN: 2393-8870

www.ijarm.com

Review Article

A Review on Modern digital technology on Higher Education

K.Viji¹ and Dr. K.Nithyanandam²

¹ Chief Librarian, Kanchi shri Krishna College of Arts & Science, Kilambi, Kancheepuram, Tamilnadu, India- 631 551.

¹ Research Scholar, Research and Development Centre, Bharathiar University, Coimbatore - 641 046, Tamil Nadu, India

² Chief Librarian, Hindustan University, Padur, Chennai, Tamil Nadu, India

Corresponding Author : vijkannan235@gmail.com

Abstract

Keywords

Digital Technology,
Digital Libraries,
Higher Education.

The present study found that there is different exist among the surveyed institutions in terms of library facilities including ICT, the library services and the initiatives from the library side towards the information literacy. This gap needs to be bridged, particularly in colleges by organizing structured and formal information literacy program particularly with regard to e-resources. Many of the surveyed institutions are need to design their own library websites, providing links to the subscribe and open access scholarly resources. Access to e-resources consortium, library networks both at national and international have to be made among these libraries. It is also suggested that many of the surveyed research institute and college and university libraries need to appoint qualified library professionals as against science and strength and need to be deputed them for professional training so as enable them to update their skills and knowledge on information science.

INTRODUCTION

In this type of research studies on quality, effectiveness, efficiency of libraries, satisfaction of users, and usefulness of services of libraries and information centers have been reported in this professional literature. Most of these studies were aimed to assess the satisfaction of users or to evaluate the quality of library and information services offered. They either used the existing methods for the study and research or devised new techniques for the purpose. A few such significant and prominent studies closely related to best practices in library and information services are reviewed in this chapter.

The researcher has collected the articles concerned on the best practices implemented in various library environments and on surveys and case studies that have taken place in Library and Information Science research with regard to innovation that are reviewed are listed with suitable headings in this chapter.

IMPACT OF DIGITAL TECHNOLOGY AND HIGHER EDUCATION

Robert Danielson (2012) studied the B.L. Fisher Library of Asbury Theological Seminary in Wilmore, Kentucky during the summer of 2011. Asbury Theological Seminary is a specialized graduate and postgraduate research institution with a full-time enrollment at the time of 1084 students with 63 full time faculties. They offer doctoral degrees in Biblical Studies and Intercultural Studies and master's degrees in theological studies, biblical studies, intercultural studies, pastoral counseling, world mission and evangelism, youth ministry, Christian ministry, mental health counseling, marriage and family counseling, Christian leadership, and a Masters of Divinity and Doctor of Ministry program as well. The B.L. Fisher Library serves the main Kentucky campus, a branch campus in Orlando, Florida, and a large distance-learning program.

Pedramnia S (2012) made analysis of service quality in academic libraries using LibQUAL scale: Application

oriented approach, a case study in Mashhad University of Medical Sciences (MUMS) libraries. The researcher has used the survey method for collecting data. Library service quality was measured by using 22 items taken directly from the 2004 version of the LibQUAL scale.

Halima St Egberongbe (2012) studied the Quality management in academic libraries in Nigeria, the investigator has approaches to quality management and quality service delivery in academic libraries in Nigeria. The Nigerian universities operate an established system of quality assurance which is mainly applied for the purpose of programme accreditation, under the supervision of the National Universities commission (NUC). The NUC, as an agency of government has an overarching responsibility for ensuring quality assurance in all universities in the country. This it does through periodic constitution of teams or panels comprising academics in relevant disciplines to visit universities and assess available facilities and resources for programmes seeking accreditation. One of the parameters for assessment during accreditation is the library and this has to do with facilities and information resources for programmes to be accredited. The only element of NUC quality assurance for the library is tied around programme accreditation. That is, the focus is only on information resources for programmes to be accredited.

The specific aspect of the investigation was to assess quality management approaches in academic libraries in Nigeria. The overall aim of the study was to identify how service quality practices in academic libraries affect institutional outcomes in various institutions. This was with a view to subsequently recommending a quality management model to enhance improvement and sustainability in both managerial and service quality of academic libraries in Nigeria.

Agrawal R Pawan (2011) Application of 'six sigma' in libraries for enhancing service quality, Quality in library service has become an important aspect of today's most competitive time. Quality has been considered an important part of any service process as well as manufacturing process. It is only quality that decides the status and future growth of an institution. Quality, though, important in any process, but in libraries it is drawing attention of management, users and staff altogether because of the pressure of growing technologies, expectation of users, high maintenance costs, increasing information resources cost, and reducing budget. This paper deals with six sigma and its application in libraries. Six sigma is a method of reducing errors and improving quality. This method was developed three decades ago for manufacturing process, but now it is being implemented in service industry too and library is not an exception. This process aims to understand strategies of six sigma and its applications in libraries. This paper also

covers some case studies to understand the effect of six sigma more closely.

Somaratna, Sajeewanie D Peiris, Colin N (2011) A survey of 614 users of the University of Colombo Library system using a modified version of SERVQUAL was carried out to ascertain the views of library users about the service level. They were asked to assess the actual service delivered by the library; to establish the importance of the service to them as users; and, to identify to what extent the service met their expectations. Exploratory factor analysis with Varimax rotation was employed to identify underlying dimensions of service quality of the Library and the best predictor of the overall service quality of the University of Colombo Library was identified by regression analysis. Finds that the service quality of the University of Colombo Library System was represented by seven dimensions and the best predictor of the overall service quality was the dimension referred to as "Collection and Access". This is the first user survey conducted in University Libraries in Sri Lanka to assess the service quality through user perspectives, discovering service quality factors.

Tapas Kumar Ghosh, Panda K C (2010) the vital task of the libraries attached to the educational institutions of higher learning is the collection development of information resources as per the requirements of the users. The Central Library of IITs have long been recognized their responsibility to support the study and research of their parent institutions with the rich collection development of information resources both in print as well as electronic format to cater the needs of the academic communities as per the multi-disciplinary and diverse academic program of the respective institutions where greater emphasis on collection of serials, the essential and integral component of updated scholarly communication. The study provides a vivid picture about the current status of serials collection in the libraries attached to the Premier Institutions of India in the field of science and technology to boost up the academic performances.

Amitha Prathan and Neela Desphande (2009) in their paper emphasized the need of quality services to be offered in library and information center, while catering to the information needs of the users. Information audit is the best tool to measure the effectiveness of the services which automatically leads to quality. The authors have chosen case study method to prove the performance of information audit. The inferences gathered are supporting the need of information audit to enhance the quality of services in any library and information center.

Peter Brophy (2008) the libraries are facing challenging environments in which services and content must be delivered into the users' workflows and "life flows". An understanding of linguistic codes and language games, and similar concepts, will help librarians to appreciate the

enormous challenge of becoming an accepted member of each user community. In order to assess performance in this changing environment, much greater emphasis will need to be placed on qualitative methods, including ethnographic approaches, externally moderated, reflective self-evaluation and narrative-based practice. Libraries themselves are changing, and most of all are being challenged to reinvent themselves within the workflows and life flows of their users. If this challenge is to be met then innovative yet robust methods need to be developed to assess the performance in this new millennium.

Ashok Kumar Sahu (2007) the study measured the perceptions of the Jawaharlal Nehru University (JNU) library users as they relate to quality service and to determine how far the JNU library has succeeded in delivering such service to its users. The research was carried out among the students and faculty members of the JNU. A questionnaire was used as the data gathering instrument. The instruments for data collection consisted of structured questions. All the closed ended questions were designed to elicit responses on a five point Likert scale to measure both respondent satisfaction and perception of service quality. Analysis of the collected data made use of the chi-square method. The results would appear to indicate that the JNU library is not lacking in quality of service. However, we need to note that quality information service is about helping users to define and satisfy their information needs, building their confidence in using information retrieval systems, and making the whole activity of working with library staff a pleasurable experience. To achieve total quality in information service the JNU library should provide a comprehensive information programme that is predicated on the needs and activities of the users. This study may help those libraries, who are seriously interested to develop user satisfaction and provide better service to the user. This study also suggests some recommendations about increasing the user satisfaction in the library service.

Balague (2007) the use of ISO 9001 quality standard in higher education institution libraries, ISO standard 9001 is one of a set of management tools that libraries have adopted in recent years. This article focuses on libraries in higher education institutions that have received ISO certification of their quality management systems (ISO standard 9001:2000). The author examines their reasons for seeking certification and the advantages and difficulties they have encountered in applying for this ISO standard. Finally, considers the future prospects of ISO standard 9001 in university libraries.

The aim of that work is to contribute to knowledge of management of the ISO 9001:2000 quality systems in libraries of higher education institutions. At a time when many university libraries are seeking the consolidation of their quality management systems in order to be able to respond in a clear and flexible way to the demands of

institutional evaluation, the study may be of interest to libraries that have already adopted the standard as well as to those that have not yet determined which quality management system to adopt. The objective of this empirical study was to highlight the main benefits provided by the implementation of ISO 9001:2000 in academic libraries. Also Reasons for implementing ISO 9001, Difficulties in the process of implementing ISO 9001, The advantages of quality certificates, and The future of ISO 9001 in the libraries in higher education institutions are discussed.

Kiran Kaur et al. (2006) in their paper described the steps in attaining the ISO 9001:2000 quality management system certification at the University of Malaya Library. This article includes description of the planning, implementation and maintenance of the quality management system by the library, along with continual improvement efforts to provide quality service to the library clientele. Finds that the move towards a quality management system within quality standard requirements, such as the MS ISO 9001:2000 proved challenging to obtaining the management commitment and the reorganization of services. Customer feedback becomes the focus of on-going planning to fulfill customer requirements. A quality management system has brought about informed decision making and increased customer satisfaction. The study is limited to only four university libraries, thus generalization to Malaysian academic libraries is premature at this stage. This paper will be helpful to libraries planning to implement a quality management system to improve its quality service and increase customer satisfaction. This paper will be helpful to libraries planning to implement a quality management system to improve its quality service and increase customer satisfaction. As libraries strive to provide quality services to their clients, it is important that their quality standards be accepted globally; therefore the implementation of a quality management system based on ISO 9001:2000 may be helpful in providing clear guidelines on measuring performance.

Derfert-Wolf et al. (2005) Quality of academic libraries - funding bodies, librarians and users perspective: a common project of Polish research libraries on comparable measures. According to the ISO Standard 11620 Performance Indicators for Libraries, the quality means "totality of features and characteristics of a product or services that bear on the library's ability to satisfy stated or implied needs". Hence the quality assessment depends not only on the product or service as it is but also on a person or institution involved in the assessment process. High quality of library performance is crucial of each research library to survive. Wide on-line access to information makes researchers and students demand the highest quality library to survive. Wide on-line access to information makes researchers and students demand the highest quality library services. It is the quality of library services that decides on the perception of the library within its parent institution and the society.

Comparable quality measures (which refer not only to library services but to all aspects of library performance) are of vital importance for efficient and effective library management. A library needs both to satisfy its users and to prove to its funding bodies that it is worth investment. Moreover, the State Accreditation Commission in the process of the assessment of higher education institutions takes the quality of library services into account. Therefore current efforts to determine unified standards and library performance indicators are a starting point to the full implementation of reliable analysis-based management and assessment. The main objective of the paper is to present the results of the on-going study of performance indicators for Polish research libraries. The report from the research together with background information on library statistical data collection reflects the overall situation of library quality measures and assessment in Poland. The study is a continuation of the activity realized in the frame of the EU Tempus Project “Development of Library Management as a part of the University Total Quality Management”. The Group for Standardization presently conducts the research in the frame of the national project financed from the funds of the Ministry of National Education and Sport. Authors of the research encountered many difficulties implied by the lack of national patterns or standards for library statistics and effectiveness measurement to follow. Therefore they have been trying to adopt model foreign solutions to the Polish realities. The paper describes the tools for library performance evaluation applied in Poland in 2003.

James A. Church (2004) the result is that the UN is an extraordinarily prolific publisher, distributing thousands of documents and publications to 405 depository libraries in 146 countries each year. The quarterly checklist of the United Nations Documents Index (UNDI), for example, lists 14,833 masthead documents for the year 2000 (**UN Dag Hammarskjöld Library, 2000**). Yet even this figure does not capture the full scope of UN publishing. Additional UN programs, funds, and specialized agencies also produce uncounted numbers of documents and publications each year. No serious attempt has been made in decades to quantify the total scope of this operation. As far back as 1979, it was estimated that the total publishing output of the UN and affiliated organizations numbered 180,000 pieces of paper annually, out of which perhaps 7500 were considered “publications” (**Marulli, 1979, p. 187**). The biggest UN collection development issue for most libraries falls in the area of publications. Sales publications are of broader interest than documents and cover a wide range of academic disciplines. The 2003 United Nations Publications Catalog, for example, classifies sales publications into the areas of reference, social science, economics, political science, international law and human rights, the environment, and science and technology (**UN Department of Public Information, 2003a, 2003b**). Table 1 outlines the categories of sales publications sent to both partial and full UN depositories,¹ regardless of geographic location. There are essentially two limitations affecting the distribution of

this important material: sales publications intended for distribution that are not supplied (and not easily claimed), and publications intentionally not sent to depositories.

Haruki Nagata, Yoshinori Satoh, Sarah Gerrard, Päivi Kytömäki, (2004) the Research paper, the objective of this study is to identify the dimensions that determine the customers' evaluation of service quality in academic libraries. One university library each in England and Finland and two in Japan were selected to conduct a questionnaire survey based on the GAP theory of SERVQUAL that has led discussions on the assessment of service quality in marketing theory and practice. Since the actual delivery of information as a service outcome is as important as the service process in libraries, attributes inherent to libraries were incorporated into the survey. Subjecting data obtained to exploratory and confirmatory factor analysis showed that library service quality consists of four dimensions: effect of service (personal), library as a place, collections and access, and effect of service (organizational), which are different from the five SERVQUAL dimensions: tangibles, reliability, responsiveness, assurance, and empathy.

Jeannette Ho and Crowley (2003) User perceptions of the ‘reliability’ of library services at Texas A&M University. Reported that findings of materials on shelf, arrangement of materials, circulation procedure, signage, and experience of using library catalogue were affecting reliability of services offered to users. They viewed that reliability dimension was an important dimension in library service quality. Many researchers used special tools developed on the basis of the principles and structures of SERVQUAL tool instead of SERVQUAL itself.

Landrum and Prybutok (2003) Service quality and success model for the information service industry used a tool, developed on SERVQUAL principles, called ISYSCESS, to measure the variables associated with information system success. They reported that items on service quality, system quality, information quality and usefulness were necessary for measuring the success of a library or information system.

Verma (2002) studied the quality management approaches followed in leading libraries in India with special reference to ISO 9000 and found that total quality management approaches were preferred to ISO 9000 and suggested that use of quality standards required more innovation and initiation or reorganization process.

Brian Quinn (2002) explaining some of the limitations and possibilities of the service quality model for academic libraries are discussed. The model was originally developed in a commercial environment and may require some adaptation to the noncommercial environment of the

academic library. Various ways in which the model might be adapted are suggested.

Peter Hernon (2002) draws a connection among four assessment concepts: inputs, outputs, outcomes, and expectations (service quality and satisfaction), identifying those that should be more prominent.

Peter Hernon (2002) examines questions related to service quality, satisfaction, and outcomes assessment. These three concepts are most likely interconnected, because any behavioral change in people likely depends on whether or not their expectations are met or exceeded.

Snoj and Peterman (2001) have developed a special tool for assessing the overall service quality in libraries in Slovenia, which contains 45 items grouped under five quality dimensions, namely physical surroundings, equipment and information technology, collection, information and library services, and staff. They reported that ‘staff’ is the important dimension affecting library service quality.

Date and Gokhale (1999) have studied the ISO certified libraries in Mumbai and compared the results with that of non-certified libraries to understand the difference in the level of quality of services offered and to benchmark on low quality services. They argued that an attempt to implement quality standard in a library itself would improve the quality of library services.

Dow (1998) have developed a special tool using educational impact as an alternative measure of library service quality based on Association of Higher Educations’ Principles of Good Practice for Assessing Student Learning. He reported that it was a good tool for assessing the impact of library services on the teaching and learning activities of faculty and students based on a study conducted at River Campus Libraries of the University of Rochester.

Nancy Courtney, Fred W. Jenkins (1998) studied the University of Dayton Roesch Library reorganized the collection development and acquisitions departments during 1995 and 1996 in order to improve the collection and make the process of acquiring materials more responsive to the needs of students and faculty. The old organization was department-based, with teaching faculty controlling most of the materials budget. The Associate Director for Technical Services coordinated the funds and supervised acquisitions staff. Perceived imbalances in the collection, student and faculty dissatisfaction with the process, and the desire for public services librarians to have greater influence in collection decisions led to a major reorganization. The new model distributes budget authority among all librarians based on subjects rather than academic departments. It empowers librarians to make purchasing and weeding decisions within their subject areas. Book and periodical acquisitions are combined into a single support unit that

reports to the Coordinator and Head of Collection Management. The new organization has streamlined acquisitions processes to make ordering simpler, and the time between ordering and receipt has been shortened. The new model shifts the emphasis from process to service.

Lindauer, Bonnie Gratch (1998) have identified the important institutional outcomes to which academic libraries contribute; described specific performance indicators whose measures of impacts and outputs provide evidence about progress and achievement; and offers a conceptual framework of assessment domains for the teaching-learning library.

D’Elia and Rodgers (1996) were applied both generic and attribute measures to library service, discovered that high levels of client satisfaction were positively related to two important measures of satisfaction: a) the quick access to information and b) the provision of service that facilitated access to that information. It was apparent that clients expected libraries to provide “access to the information they needed whether through the library’s collection or through facilitated access to other sources”. The identification of access as an outcome measure has major ramifications for how libraries meet the information needs of their clients and for the provision of interlibrary loan service.

Cullen and Calvert (1995) studied the university library effectiveness in New Zealand and assessed the level of satisfaction of the user community. They reported that ‘competence of library management’ is the key indicator of library effectiveness to resource allocators, ‘helpfulness and courtesy of staff’ for library staff, ‘expert staff assistance to user’s for faculty, ‘match of hours of opening with the user needs’ for graduate students, and provision of multiple copies of documents in high demand’ for undergraduate students.

Brophy (1993) shared his experience with the implementing ISO 9000 in the library was to provide highest quality library services to the users. There were three levels in implementation. At the strategic level, an overview of the library’s performance and success in meeting strategic aims was done. At the operational level, the quality of service the individual user receives was analyzed. At the third level, monitoring, maintaining and improving quality was ensured.

Powell Ronald (1992) a list of several performance indicators of impact derived from his literature review (test scores, course evaluations, course grades, quality of papers) and recommended user panels for data collection because, “they share some of the strengths of focus group interviews but go beyond them by being more longitudinal and comprehensive”.

Parasuraman et al. (1988) service quality is more of a global judgment and evaluation based on a number of normative standards and one based on long term attitudes towards service. Service quality is conceptualized as a client's judgment about an entity's overall excellence and superiority and is referred to in the literature as perceived quality. Perceived quality is distinguished from objective quality which is conceptualized as the functional aspects of a service, and it is characterized as being the result of the client's comparison of expectations of performance with the client's perceptions of actual performance.

LIBRARY SERVICES

Manorama Tripathi and Sunil Kumar (2010) the study use of Web 2.0 tools in academic libraries: provided a reconnaissance of major academic libraries located in Australia, Canada, the U.K. and U.S.A. that have embraced Web 2.0 tools for enhancing library services. The research is based on a survey of websites of 277 university libraries. The checkpoints used for this evaluative study were given by Nguyen (2008) for evaluating various Web 2.0 tools. Additional checkpoints were arrived at after visiting and browsing the various sites. The findings of the study acknowledge the strength of Web 2.0 tools in improving library services for users. Really Simple Syndication (RSS), Instant Messaging (IM) and blogs are popular in academic libraries. The paper concludes by offering best practices for implementing Web 2.0 tools in academic libraries

Wyoma van Duinkerken (2009) explained that the service to our users is the principal basis for a library's existence and as users' expectations increase, libraries must continually change their organization's policies, procedures and workflows to meet these expectations. In order to achieve this in the Acquisitions Monographs Unit at Texas A & M University (TAMU) Libraries, Library Administration utilized a public service librarian who has a strong user oriented background to provide a fresh look at established procedures. This librarian examined TAMU Libraries Acquisition Monographic policies, procedures and workflows from a user perspective and found some of them to be out of date. Then the librarian researched other businesses and libraries best practices which she then adopted and modified to fit the needs of her unit. These "New Best Practices" could be transferable to any library facing similar organizational needs.

Mark Needleman (2007) described the work of the NISO (National Information Standards Organization) Web Services and Practices Working Group, chartered in 2005 to develop best practices and services for using Web services in library applications.

Paul Wiener (1982) recently surveyed by the author of 110 academic libraries of all types and sizes shows that the majority provide recreational reading services to their ca

mpuses. Data are presented to demonstrate the great variety in structure, staffing, management and budgeting for such services that permits them to flourish in a tight library economy and an information- and technology-loaded environment. A profile of these services is drawn that throws into question many reasons given for not providing such services. Finally, a rationale for continuing and expanding such services based on current cultural trends and projected needs are offered.

DIGITAL LIBRARY SERVICE PRACTICES

Panda, K. C. (2011) attempted to make the user community aware of e-news and e-news services offered by different e-news channels all around the world, provides a brief discussion of history and developments of e-news services, newspaper websites and latent advantages of e-news in the electronic era. Employs literature survey method to unfold the latest trends of e-news industry and finds that, though e-news services provide immense opportunity to the readers and simultaneous access at infinite points and reading at ones convenience, still a few key technical challenges like, navigational support, hyper linking, and designing of e-newspapers needs to be properly taken care of and tackled with Concludes with the recommendation that information professionals should take steps to increase the usage of e-newspapers by their intended audience.

Surender, H.S. Chopra (2011) this paper discusses the various aspects of digitization of resources in University Libraries. It also describes the digitization initiatives that have taken place in University Libraries in India. It discusses the current status and trends of digitization in some University Libraries.

Cathy Maskell et al. (2010) surveyed library directors in the Ontario Council of University Libraries consortium regarding weeding, last copy print archiving, and the role of the consortium. Responses reveal divergent opinions but an answer lies in partnerships. Cost remains an over-riding factor and the uncertainty of future budgets make commitment to long-term planning difficult.

Walmiki, R.H. (2010) found that 39.79 percent of the faculty members are aware of and use the UGC-Infonet Digital Library Consortium resources whereas 35.99 percent are aware but do not use and 24.22 percent are not at all aware of the availability of the consortium resources. Majority of the non-users belong to social sciences and humanities and those who have not undergone formal computer training. Comparatively the science faculty uses the consortium resources more frequently than those belonging to social sciences and humanities. Lack of knowledge to use, insufficient internet nodes, slow bandwidth and lack of relevant information sources are found to be the major problems faced. Only 5.22 percent of the faculty members have indicated that they have necessary

expertise to use the digital resources. About 37 percent of the faculty members were aware of and participated in user education programmes conducted by their university libraries.

James T Mellon & David J Williams (2010) examined the best practice in web site redesign the authors established for its two interconnected parts, the web development process and web design. The paper demonstrates how best practices were applied to coordinate a library web site redesign project and to engineer the web site for optimum usability, resulting in the creation of a new improved web site. The paper presents a detailed exposition of a three stage project, and provides reasons for adopting best practices in redesigning each web site area. Findings - In a resource-challenged mid-sized academic library, like QCL, it is still possible to create a fully functional easy-to-use web site. The paper focus on both the web development process and web design, explicating the establishment and application of best practices for both areas.

Shukla, Akhandanand (2010) examined status of content on websites of libraries' belonging to Indian academic institutions. Establishes a method to measure Overall Website Performance Calculation (OWPC) and Criteria-wise Website Performance Calculation (CWPC) of library websites. Comparative study of 20 central universities and 19 institutes of national importance including Indian Institutes of Technology (IITs) and Indian Institutes of Management (IIMs) academic libraries from India suggest that the library websites of institutes of national importance have better content awareness than central university library websites as per the identified criteria. The criteria studied would be helpful for librarians and webmasters to improve content awareness status of their library websites.

Li-Shan Chen (2008) combined swarm intelligence and Web Services to transform a conventional library system into an intelligent library system with high integrity, usability, correctness, and reliability software for readers. We select 300 readers to test this intelligent system and software, and compare it with a conventional library system. It is revealed that 64 percent of the readers are dissatisfied with the conventional library system, and 93 percent of the readers are satisfied with the intelligent library system when using personal digital assistants. The software integrity satisfaction was 99.99 percent; usability satisfaction, 93 percent; correctness, 95 percent; and reliability, 95 percent.

Marcos Andre Goncalves and Barbara Moreira (2007) studied quality model for digital libraries "elaborated on the meaning of quality in digital libraries (DLs) by proposing a model that is deeply grounded in a formal framework for digital libraries: 5S (Streams, Structures, Spaces, Scenarios, and Societies). For each major DL concept in the framework we formally define a number of dimensions of quality and propose a set of numerical indicators for those

quality dimensions. In particular, we consider key concepts of a minimal DL: catalog, collection, digital object, metadata specification, repository, and services. Regarding quality dimensions, we consider: accessibility, accuracy, completeness, composability, conformance, consistency, effectiveness, efficiency, extensibility, pertinence, preservability, relevance, reliability, reusability, significance, similarity, and timeliness. Regarding measurement, we consider characteristics like: response time (with regard to efficiency), cost of migration (with respect to preservability), and number of service failures (to assess reliability). For some key DL concepts, the (quality dimension, numerical indicator) pairs are illustrated through their application to a number of "real-world" digital libraries. We also discuss connections between the proposed dimensions of DL quality and an expanded version of a workshop's consensus view of the life cycle of information in digital libraries. Such connections can be used to determine when and where quality issues can be measured, assessed, and improved – as well as how possible quality problems can be prevented, detected, and eliminated.

Karen Calhoun (2002) discussed the design, implementation and evolution of the Cornell University Library Gateway using the case analysis method. It diagnoses the Gateway within the conceptual framework of definitions and best practices associated with information gateways, portals, and emerging digital library management systems, in particular the product Encompass.

Das, Suchitra (2000) discussed the information sources available on internet and possible information services in library and information centers. Also talks about their availability on website, guide to surf the available ocean of information resources, the information contents of the available resources, and their possible organizational and dissemination in library and information centers as a challenge for the library professionals. It also highlights the economics of periodicals subscription because of the arrival of scientific publishers on website. Limitations to access. The available sources on website are also discussed.

PRACTICES ON USER EDUCATION

Shalini, Singh. (2012) the author expresses her views as to how the information and knowledge are critical for realizing all the human aspirations. In the knowledge society in which we live today, acquisition of information and knowledge and its applications have an intense and pervasive impact in the processes of exercising their political, economic and legal rights. In the present era, India is on the uppermost belt of all developing countries. To enhance this technology boon, government of India has enforced the right to information act. The paper discusses, the concept of right to information and information Literacy, the initiatives taken to promote information literacy in India; the issue of how to promote information

literacy to make good use of information, so that they can be effectively uses RTI and can participate in the process of development.

Amritpal, Kaur. (2012) The study explores the status of information literacy skills of students of Guru Nanak Dev University, Amritsar, their information seeking strategies and ability in acquiring, organizing, evaluating and using the information effectively. A well-structured questionnaire was designed to collect data for the study. Personal interviews were conducted to fill in the gaps in the questionnaire. The collected data was analyzed with the help of SPSS. The major findings of the study were that a majority of the respondents possess knowledge of MS-office, social networking sites and e-mail. Among six types of internet searching tools, search engines and wiki was the most common, while blogs, online bibliographic database and subject gateways/portals were less frequent. On the basis of the findings, some suggestions have been put forward to improve the information literacy skills of the students.

Kristin Henrich and Ramirose Attebury (2010) a new Approach to Mentoring at the University of Idaho identified that the increased focus on interdisciplinary and collaboration in academia necessitates a reevaluation of established mentoring practices. This article reviews the literature on traditional and peer mentoring models, explores Communities of Practice (CoP) within learning organizations, and discusses the implementation and evaluation of a CoP at the University of Idaho.

Nayana Darshani Wijayasundara (2008) reported that the Faculty–library collaboration paves the way to make students information literate and finally to make them life-long learners. In traditional universities, the faculty–library collaboration is an emerging phenomenon as these two entities are driven by separate agendas; teaching and providing services. Rapid development in information and communication technologies has built a platform for these two institutions to work collaboratively and for making synergies. The purpose of this paper is to describe the conceptual model for faculty–library collaboration based on the extensive literature review and some strategies used by librarians at University of Colombo to collaborate with the academics.

Tahir, Muhammad. (2008) explores the information needs and information-seeking behavior of humanities faculty members of the University of the Punjab, Lahore. It investigates the methods and sources used to acquire information, the importance of various information resources for their teaching and research activities, their preferred formats, the purpose of their information-seeking and problems faced. A questionnaire-based survey was conducted to get a response from the targeted population

humanities departments. The response rate was 69 percent. The study reveals that most of the humanities faculty members rely heavily upon books and experts in their subject fields for teaching and research activities. Print was the preferred format and meeting personally for face-to-face discussions was the most frequently used channel of communication. The lack of availability of required material was the number one problem in information-seeking process. The findings of this study will be useful for library professionals to understand the information needs and information-seeking behavior of humanists.

Hooks, James (2008) the present study emphasizes that although information literacy objectives are a constant, teaching methods and pedagogy must be structured differently in different teaching-learning environments. The Libraries of Indiana University of Pennsylvania (IUP) created a new model of library instruction for its branch libraries and branch campuses, based on the embedded or college librarian model. Librarians for music, science, education, and the IUP North Pointe campus have been integrated into the instruction and curricular activities of those locations, some of which include distance education programs. While this model has logistical and political challenges, it has proved beneficial in improving information literacy for both faculty and students, and for providing visibility, opportunities, and recognition for library faculty.

Nancy Dewald (1999) 68 studied the criteria for good library instruction practices were applied to Web-based tutorials selected by the ALA Library Instruction Round Table. Face-to-face instruction and the online environment do not always lend themselves to exact parallels, yet in some respects the traditional criteria can guide librarians in developing good online instruction.

INFORMATION NEEDS AND USERS PATTERN

Information need is an individual or group's desire to locate and obtain information to satisfy a conscious or unconscious need. The 'information' and 'need' in 'information need' are inseparable interconnection. Needs and interests call forth information. The objectives of studying information needs are:

- ❖ The control and thereby improvement of the utilization of information manipulation of essentials conditions.
- ❖ The explanation of observed phenomena of information use or expressed need;
- ❖ The prediction of instances of information uses;

Doraswamy, M (2012) has conducted a study of the information use pattern of library services and facilities by the faculty members of Siddhartha Educational Institutions in Vijayawada. A questionnaire was distributed to 640

faculty members and 455 filled in questionnaire were return, giving an overall response rate 71.09%. The results shows that the senior faculty members are using the borrowing facility, reference service and internet searching facility more in number when compared to junior faculty members. Overall the faculty members heavily using the borrowing facilities and less use of the current awareness service, selective dissemination of information service and Inter library loan services when compared to other services.

Niruba Sethukumari, S & Thirumagal, A. (2012) has analyzed the several means of modern technologies, which brought many services to libraries so as to speed up their activities. They include telecommunication technology, E-mail, online retrieval service, Library network and internet. The digital resources offer a solution to three most fearsome challenges facing academic libraries today like economical survival, shortage of space and management of materials. The digital libraries help not only in storage of information but also they act as information repositories. Digital libraries promote resource sharing, but in the long run it can also help in sharing of knowledge, resources and money too. KITTS (Kerala Institute of Tourism and Travel Studies) library disseminate information in print and digital form to the user community. Internet services, Digitization of special collection. Digital reference service, e-library browsing are some of the modern services of the library to their users. This study tries to identify the information sources and services available in the library and how the student community qualitatively and quantitatively utilizes the same.

Abdul Majeed, K.G & Femin, V.T (2012) examined the use of e-journals and print journals by the medical community in Govt. Medical College Library, Calicut, and Kerala state. This study aims to assess the preference in the use of e-journals among medical community and the problems in using both print and electronic journals. Even though the medical community indicates preference towards electronic journals, but they use print journals. This study reveals that the major problems pertaining to the use of both e-journals in the medical college library are lack of organizations of e-journals, availability of plenty of literature, inefficiency of search engines, lack of awareness about the e-journals etc.

Chamani Gunasekara (2012) has conducted the survey among the members of academic staff of Faculty of arts at university of Peradeniya, to examine the library usage pattern. This study was attempted to assess the user satisfaction towards the library services and resources while identifying the constraints are faced in using the library. A questionnaire was used as a data collection tool. The findings of the survey revealed that the faculty staff visits the library mostly for checking our books and for using the reference collection. Most of the faculty members were satisfied with the arrangement of the resources and the

physical condition of the library. Most of faculty members showed highest level disagreement with the statement given in the questionnaire as the barriers encountering when using the library.

Suvra Chandra (2012) has revealed the survey about electronic resources and their use by users of the library and documentation centre of Narula Institute of Technology. Most of the users prefer electronic resources for their better and faster access and save physical storage space. Lack of awareness and they need training in using e-resources.

Bharathi, V & Nagarajan (2012) have examines the use of e-resources at K.S. Institute of technology. A questionnaire was prepared to elicit opinions from the users of e-resources. The responses were gathered from 98 users. The results of the survey provide information about the type of e-resources used, purposes for which e-resources used, problems faced by the users while using e-resources, benefits of e-resources over conventional resources. Success rate of finding required information in e-resources adequacy of information in e-resources on the basis of results of survey some suggestions have been put forth for optimum utilization and application of e-resources.

Thanuskodi ,S (2012) Internet rapid growth and broad presentation, along with affordable enabling 2.0 technologies, has not only democratized access to information but also catalyzed open access publishing which has contributed mainly to the explosion of freely available digital information. This phenomenon poses tremendous challenges and opportunities, for libraries and librarians in delivering on their core mission of facilitating research, teaching, and learning in discovering ,collecting , organizing and preserving invaluable knowledge from this vast information base.

Rabinarayanan Misra (2011) has focuses on information use pattern by scientists engaged in various research and development programs at NEIST (North East Institute of Science and Technology). Data collected from 186 research scholars are taken for analysis. The library is equipped with e-resources which have become the primary sources of information for the users of the library, under study most of the scientists and research scholars prefer to use current periodicals to keep them update in the knowledge of their interested field. KRC (Knowledge resource centre) needs to be fully automated for providing value added information and services to the scientists which has become essential in present day context as the library has become a work house for the different R&D programmes in the science and technology institutes, and also due to the increasing demand for processing of data and retrieval of information in the easiest and quickest possible time. KRC is yet to come out with such facilities as the automation work is still in progress.

Thanuskodi, S & Ravi, S (2011) have described Sources of information available via the Internet are increasing exponentially, leading to steady increase in the use of Internet for education and research. Since past few years free online information sources like e-journals, e-books, e-databases have increased considerably. Earlier, information and knowledge were passed by word of mouth or through manuscripts, and communication was a slow process. Today, it is passed from one individual to an infinite number of other users through a number of media and formats which makes rapid and widespread dissemination of information possible. This paper discusses utilisation of digital resources by faculty and research scholars of Manonmaniam Sundaranar University, Tirunelveli. Results shows that 67.14 percent of the faculty is familiar with the use of digital resources and majority of these members are using digital resources for research purpose. Study also reveals that majority of the faculty members are learning the required skills for the usage of digital resources through self-study.

Biradar, B S., Santhosh Kumar, K.T. & Chetan Kumar. C (2011) have investigates the utilization pattern of periodical literature among the faculty members at JNN College of Engineering. About 110 questionnaires were distributed and 96 were received back. The study found that equal number of users (40.62%) use both Indian and Foreign periodicals once in a week. As far as purpose of using periodicals is concerned, as first preference updating the latest development (55.68%) followed by gaining deeper knowledge (54.54%). 48.95% of users rated as excellent for printed version, whereas 28.12% for electronic version and 60.41% of users preferred both print and electronic version.

Shiva Kanauja Sukula & Neeraj Malik (2011) provide some insight into changes that are occurring in the e-journal growth, usage and pattern study among humanities and social science readers and the ways in which libraries and information centers are addressing these changes in light of the availability of e-resources, particularly e-journal. The paper discerns aspects of library interfaces that attempt to Identify the needs of today's information seekers and describes a new approach for creating a user experience layer for e-journals and delivery system from UGC infonet serves as an example of a library interface that was designed in light of this new approach.

Guruprasad R & Khaisar Nikam (2011) have attempted to study conventional and electronic information resources used by the Indian aerospace scientists and engineers of aerospace organizations of Bangalore. Aerospace is key technology today owing to its huge growth in Asia in general and India in particular. Indian scientists and engineers currently working on strategically important projects depend heavily on rapid collection of information from various e-information resources. Seeking information

is an endearing activity. This book analyzes in detail use patterns with specific reference to various aerospace engineering e-journals and core e-databases frequently used by Indian aerospace scientists and engineers in their R&D activities. Use pattern of electronic information resources is same for scientists and engineers irrespective of their disciplines. But, aerospace scientists and engineers have an advantage as they are well exposed to the e-Environment and IT due to nature of their work itself. The use of Electronic Information Resources is highly expected from them particularly as an Integrated Information system to their learning and working environment.

Thanuskodi, S. (2011) the need for reforms in education by harnessing Information and communication technology (ICT) is increasingly being accepted as essential by universities and cultural organizations across India. The National Policy for ICT in education, under formulation, highlights the need to integrate ICT as a subject in the curriculum as well as to strengthen the overall teaching and learning process. Open and distance education systems in India use EDUSAT and other TV and radio channels for delivering content; but ICT is yet to be used significantly for the delivery of content. Personal computers have played a vital role in our everyday lives today. Everywhere, right from the retail shops to the atomic research centers, computers are being used. The growth in popularity and networking of computers led to the phenomenon called internet. Internet is believed to be a very powerful tool for information searching. Today from teens to old persons, everyone is using internet. The results of this study showed that faculty respondents rank the first position with respect to their overall frequency of using internet; research scholar respondents the second; post graduate students the third; undergraduate students the last. Study revealed that under graduate respondents take the first position with respect to their overall purpose of using e-resources, post graduate respondents the second, research scholars the third and faculty respondents the last.

Sunil Tyagi (2011) described in his study sought to determine how scientists of Pharmacopoeial Laboratory for Indian Medicine (PLIM) use Electronic Information Resources, whether print or electronic are used more, and whether there is a pattern among types of users. The aim of this study was to examine the scientists' perception of information resource use patterns, access to types of sources and to scientific libraries, and use of particular information technologies. The problem has been studied based on the information available in the open literature and a survey conducted. A questionnaire was distributed among the Scientists of Pharmacopoeia Laboratory for Indian Medicine (PLIM) to collect desired data. A total of 30 questionnaires were distributed to the selected sample for the current year; 25 valid samples were collected and analyzed. The result showed a growing interest in online journals. The survey showed that a majority of respondents

thought that the library possessed useful online journals and databases for the scientific community. Awareness among the users about the availability of online journals was found to be highly satisfactory. Online journals were mostly used for research.

Thanuskodi, S (2010) described ongoing work which involves examining the information use pattern of the legal professionals of District court. The findings indicate that practicing lawyers were using a variety of information sources to satisfy their information needs. Respondents preferred to first consult their personal library before resorting to other information providing sources and agencies. Thus group of district court lawyers often found it difficult to find the information they were looking for when using digital law libraries. The present studies observed that majority of respondents were not aware e-resources. On the whole, respondents perceived district bar library collections, Services and facilities as adequate to meet their information needs effectively.

Haneefa & Sheerna George (2010) surveyed the web based information retrieval pattern of doctoral students in Calicut University by distributing a questionnaire to 131 research scholars. Out of 113 returns, 104 were found valid. The survey revealed that 50% of the respondents used the Cyber Café (University computer centre) for web surfing and 18.26% used department 40.38% surfed the web daily and respondents accessed the web for a variety of purposes from communication to entertainment and the major factors that hindered the use of the Web resources were lack of infrastructure. The researcher further reported that most of the doctoral students in Calicut University did not know how to use the web-based resources effectively. The researchers suggested workshops on the searching methods and strategies and orientation programmes to make the research scholars more effective users.

Ansari, Munira Nasreen & Zuberi, Bushra Adeb (2010) have conducted a sample of seventy faculty from the University of Karachi, Faculty of Arts were surveyed, explore the University of Karachi's facilities for using electronic resources. Some departments have fully-equipped computer labs, while some have a few computers. A few departments also provide computers to individual academic in their offices. An Internet connection is available to 92.9 percent of the departments. A majority of the academics have computer skills that facilitate the use of electronic resources, although majorities have little knowledge of electronic resources, which is not a positive aspect of the finding. Most of use either electronic and printed resources, or only printed sources. Electronic resources are used for research and for preparation of lecturers. Lack of knowledge and lack of facilities are the main reasons for not using electronic resources. Nearly all respondents are satisfied or quite satisfied with available resources.

Vijayakumar, M. Kannappannavar., Jnana Sahyadri & Samir Kumar Jalal (2009) have attempts this work for the part of the research work carried out at Kuvempu University, India, Here survey has been made for 650 Research Library users on the use and impact of library services in technological changing environment. The survey results that majority of the R&D library users the library services daily that too. Literature search is predominately used through automated, LAN and web based library services. The survey points out that as per the co-efficient of variation the variable 'enabled the rapid communication' is most significant when compared to other impact of IT on library user.

Khan & Naved (2009) revealed that most of the research scholars were aware of the availability of e-journals and largely used them for reference purpose. The respondents agreed that the usage of e-journals improved their quality of research and enhanced productivity. The bibliographic database linking to the full-text enables the respondents to be up-to-date. The respondents also recorded that the electronic journal enable them online manuscript submission. The survey reported that the lack of training was an obstacle in proper and full utilization of e-journals.

Parameshwar & Patil (2009) has studied on "Use of the Internet by the Faculty Members and Research Scholars in Gulbarga University" used questionnaire and found that E-journals were the most popular Internet resources. The search engines were the most common way of access for more than 60% of the respondents. All the respondents used search engines, with Google preferred by more than 80% of the respondents.

Baer, William & Lisha Li. (2009, June) have reported the results of a survey conducted at the Georgia Institute of Technology. The students and faculty of the schools of civil and mechanical engineering were asked about how they use the library. They were also asked questions concerning their information seeking habits. The responses from undergraduate students, graduate students and faculty are compared, revealing expected and unexpected patterns.

Margam Madhusudhan (2008) has focused on the use of UGC-Infonet e-journals by research scholars and students. The main aim is to identify the needs and requirements of users in general and to know the use of UGC-Infonet Library and Information Science e-journals in the University of Delhi by research scholars and students of DLIS in particular. A survey was conducted through a questionnaire circulated among 40 research scholars (PhD and MPhil) and 28 students (MLISc) studying in the DLIS, University of Delhi, Delhi, for the academic year 2006-07. The response rate was 94 per cent. The study shows that e-journals perform an increasingly important role in research at DLIS. Not only current e-journals are required, but research scholars and students need to be provided the use

of significant electronic back runs as well. There is an ever increasing demand for subscriptions of more e-journal titles in LIS. There appears to be some need for academics to be provided with training in using e-journals. The area where the greatest need for training is around managing references.

Miranda, Silvania. V & Tarapanoff, Kira M.A (2008) have deal with the identification of the information needs and information competencies of a professional group. A theoretical relationship between information needs and information competencies as subjects is proposed. Three dimensions are examined: cognitive, affective and situational. The recognition of an information need was linked to the development of competencies to analyze the problem in focus. Qualitative epistemology was used and the research strategy was a case study. The research techniques were document analysis, interviews, participant observation, work process analysis and focus groups. The analysis of critical success factors and the work processes mapping brought understanding of the relationship between the identified information needs and the information competencies developed to satisfy them. Information needs were closely linked to the needs of the work processes and that the competencies developed to attend these needs were closely related to the success factors. The proposed research framework offered a new perspective that had positive results in understanding the main characteristics of the activity.

Galyani Moghaddam, Golnessa, & Talawar, V.G (2008) revealed in this paper is to investigate the use of scholarly electronic journals at the Indian Institute of Science. The paper examines the methodology and results from a questionnaire-based survey of networked electronic services in India at the Indian Institute of Science (IISc) libraries serving a variety of disciplines. A random sample of the main cohort was selected and during five months from January 2004 till May 2004, 700 copies of the questionnaire were distributed among forty departments of IISc; 397 completed and valid questionnaires (56.7 percent) were received. The results showed a growing interest in electronic journals among the users at the IISc. The electronic journals were mostly used for research needs and PDF format was the most preferred format. The fact that users have free access to electronic journals at all hours from their own computers seems to be the most appealing feature.

Bansode, S.Y., & Pujar, S.M (2008) studied the use of internet by research scholars in Shivaji University, India. They found that nearly 78% of the students used internet for 38 communication purposes and that 68.03% of researchers were using internet for research purposes. Majority of the users made use of search engines for locating the desired piece of information rather than using subject directories or subject gateways. The study showed that all the respondents made use of keywords to retrieve information, followed by 60 respondents (49.18%) who used authors as the option for

search. Search by title was used by 49 (40.16%), date of publication, source, use of Boolean operators and wild card as search techniques were used by some of the researchers, ranging between 30.32% and 1.63%. It was observed that researchers from the field of science made frequent use of keyword, author, title or the Boolean logic as search techniques where as researchers from social sciences and humanities did not make use of wild card for searching the information. The responses revealed that 88 (72.13%) users found it very difficult to extract exact information from the retrieved results. This highlighted the need for the university library to undertake orientation programmes on search techniques. Sixty one (50%) users accepted that they lacked searching skills and training was necessary. The researchers in the sciences (up to 90%) were making maximum use of internet facility provided by the university to meet their information requirements. However, majority of researchers in social sciences (64%) and humanities (85%) were still relying on bibliographies and printed journals available in the university library.

Al-Wehaibi, K., Al-Wabil, A., Alshawi, A. & Alshankity, Z (2008) have examined problems that faculty members experience in their adoption and use of Internet technologies in teaching, communication, and research. It was found that the most common barriers are related to Internet connectivity, intellectual property issues, and concerns with the loss of privacy. The findings indicate no significant differences associated with faculty members' gender, academic discipline, teaching experience, and age. However, significant correlations were found with faculty members' academic rank and years of Internet experience.

Bharati S., & Mustafa Zaidi, S (2008) have described highlights the importance of e-journals by the users of Aligarh Muslim University. The questionnaire supplemented with interview schedule was used to solicit the opinions of the user group. Nearly 325 responses were gathered and the results are analyzed and presented here with. Besides extensively covering the use of E-journals and E-databases, the paper also examines the utilization and satisfaction levels of users with respect to E-Journals /E-Databases. Use of internet and different search engines as an alternative to the low usage of UGC InfoNet is presented. Lastly, some of the valuable suggestion given by Faculties members and Research Scholars are highlighted.

Biradar, B.S., & SampathKumar, B.T. (2008) conducted the study to use of search engines by research scholars and faculty members of physics departments in the universities of Karnataka State, India. The respondents of the survey constituted all the 189 research scholars and faculty members in the department of physics in six universities in Karnataka State and the Indian Institute of Science, Bangalore. It was found that majority of the respondents were aware of Yahoo and Google while they were not aware of many other search engines like, Lycos, Hotpot, Excite, Northern light and so on. Study also showed that

few respondents learnt Internet use through library staff and quite a good number of users learnt through using help features and by reading articles 37 on search engine. In this regard, it was suggested that librarians should organise workshops on use of search engines and also assist users at the time of searching literature using search engine. Library instructional programs could emphasis on the use of different search engines and their search strategies in retrieving need based information.

A study by **Doraswamy (2007)** on “Knowledge and the use of digital library resources by engineering faculty affiliated to Acharya Nagarjuna University, Andhra Pradesh” revealed that most of the faculty members were familiar with digital resources, 87% of the faculty members used the digital resources to update their subject knowledge and communication skills, 45% of them learned to use the digital resources through self-study and 49% of the respondents were satisfied with the adequacy of digital resources.

Information use pattern of scientist from web –based Information resources: A Pilot study by **Tilwani & Satish Kumar (2007)** collected data from research scholars and faculty members at Maharshi Dayanand University, Rohtak using a questionnaire. The study suggested providing enough PCs, user’s guidelines, training and awareness.

Christina, K. Pikas (2006) has provides a review of the extensive research on the social structure and process of informal scholarly scientific communication and more recent research on the adoption and use of information and communication technologies by scientists for informal scholarly scientific communication. The benefits and uses of the information and communication technologies reported in the literature were examined to determine the influence of the technologies on the prior system. Information and communication technologies have not changed the social structure of science, but have enabled new forms of remote collaboration and slightly higher productivity as measured by number of publications. Informal Scholarly Scientific Communications.

Gayatri Mahapatra (2006) has described Information is the key element for any kind of research and development. With the introduction of computers and other telecommunication facilities, information is now available to the scientists in variety of formats. The study explores the habit of use of documents and the library by the scientist, engineers and technologist of Indian petroleum industry in the electronic era. It attended to correlate the need of information with habits of using of library. Concludes that information needs and habit of library use of scientists and technologist are related to their rank in organization. The online access service, offline digital sources and internet services are the most popular library service in upcoming electronic culture.

Gill & Singh (2004) assessed the information needs of the research scholars in the faculty of the life sciences at the Guru Nanak Dev University. Amritsar through questionnaire distributed to all the research scholars pursuing the doctoral degree and only 51 scholars responded. The results of the study were 39.2% of the respondents mentioned that the library resources including electronic resource service were sufficient for their information needs and 35.3% of the respondents mentioned that they received personal assistance from the library self in locating the reading materials occasionally.

Biradar, Santhosh Kumar & Anil Kumar (2003) revealed the study on Information use pattern by scientists at Karnataka State Sericulture research and Development Institute Library, Bangalore, found that only 4% of the respondents most frequently used the CD, 10% used frequently, 32% used occasionally and 54% most responded and 4% frequently accessed the online resources, 32% rarely accessed and a majority of 64% did not respond.

Opeke, Rosaline., Osunkunle, Sola & Okwilagwe, O.A (2002) described three levels of Information need for scientist 1) research and development 2) planning 3) execution (Atinmo 1998) Scientist seek information through informal sources first before checking the formal sources, professional meetings, fellow members of committees and confirmed

Guthrie (2002) reported that the JSTOR system provided electronic archives of scholarly journals JSTOR used log analysis of both viewed and printed articles to characterize the use. In 2000, JSTOR surveyed more than 4,000 academics in humanities, social sciences and economics to discover usage patterns and preference of university faculty. The research revealed that more than 60% greatly valued e-journals, were comfortable using e-resources, and they believed that a variety of e-resources were important in their research, and considered electronic databases invaluable. The faculty used online catalogs, full text electronic journal databases and abstracting/indexing databases the most and they expected to use them more extensively in future

REFERENCES

- Abdul Majeed, K.C & Femin, V.T (2012) Journal use pattern among medical community: a case study of Government Medical College, Callicut, Kerala. *Kelpro Bulletin*, 16(1), pp.49-55.
- Al-Wehaibi, K., Al-Wabil, A., Alshawi, A. & Alshankity, Z. (2008) Barriers to Internet Adoption among Faculty in Saudi Arabian Universities. In J. Luca & E. Weippl (Eds.), *Proceedings of World Conference on Educational Multimedia*,

- Hypermedia and Telecommunications 2008 (pp. 24-33). Chesapeake, VA: AACE. Retrieved from <http://www.editlib.org/p/28372>.
- Amitha S. Pradhan and Neela J. Deshpande (2009), Use of Information Audit to enhance the Quality of Library and Information Services: A Case study of the Central Library, Sinhagad College of Engineering, Pune, Proceedings of the National Seminar on Library and Information Services in Changing era, 22-23, University of Pune, pp. 321-328.
- Amritpal kaur, Sarman, Sarita Rani (2012), Information Literacy among the students in the electronic environment: A case study of Guru Nanak Dev University, *SRELS, Journal of Information Management*, 49(1), paper-A, pp.21-38.
- Ansari, M. N & Zuberi, B. A. (2010) Information seeking behaviour of media professionals in Karachi. *Malaysian Journal of Library and Information Science*, 15(2), pp.71-84.
- Ashok Kumar Sahu (2007), Measuring service quality in an academic library: an Indian case study, *Library Review*, 56(3), pp. 234-243.
- Available at: <http://www.un.org/aboutun/unchart.pdf>.
- Available at: <http://www.un.org/Depts/dhl/deplib/i189a11.htm>.
- Available at: <http://www.un.org/Pubs/catalog.htm>.
- Baer, William., & Li, Lisha. (2009) Library and information use patterns by engineering faculty and students. ASEE Annual Conference Austin, TX.
- Balagué (2007), The use of ISO 9001 quality standard in higher education institution libraries. *textos universitaris. De biblioteconomia i documentacio* No.19.
- Bansode, S.Y, Pujar, S.M. (2008) Use of Internet by research scholars at Shivaji University, Kolhapur, *Annals of Library and Information Studies*, 55(2), pp.123-126
- Belkin (2008), Awareness and Utilization of Information Communication Technology among the Members of Faculty of Government Engineering Colleges in Tamilnadu: A Study, *Indian Journal of Information Science and Services*, 2(1), 46-51.
- Bharathi,V & Nagarajan (2012) A case study on use of e-resources by the users of K.S.Institute of Technology, Bangalore, *Professional journal of Library and Information technology*, 2(2), pp.70-78.
- Bharati,M.S.Z.,& Zaidi ,S. M.(2008) Use of E-Journals and E-Databases of UGC-Infonet Consortium by Faculties Members and Research Scholars of Aligarh Muslim University, A Survey, *International CALIBER-2008*, pp.529.
- Bhattacharya (1978), Information Science: a verified view through a system approach.
- Biradar, B.S. & Sampathkumar, B.T. (2008) Use of search engines by research scholars and faculty members of physics departments in the universities of Karnataka State, *Annals of Library and Information Studies*, 55, pp.62-68.
- Biradar,B. S., Santhosh Kumar, K .T., Anil Kumar C. (2003) Information Use pattern of Sericulture scientists: A case study of Karnataka State Sericulture Research and Development institute Library,Bangalore, *SRELS Journal of Information Management*, 40(3), pp.255-265.
- Brian Quinn (2002), Adapting service quality concepts to academic libraries, *The Journal of Academic Librarianship*, 28(4), pp. 224-231.
- Brophy, Peter (1993), the quality program of the library and learning resources service at the University of Central Lancashire, *Aslib Information*, 21(6), pp.246-248.
- Cathy Maskell, Jennifer Soutter and Kristina Oldenburg (2010), Collaborative Print Repositories: A Case Study of Library Directors Views, *The Journal of Academic Librarianship*, 36(3), pp.242-249.
- Chamani Gunasekera (2012) Library usage pattern of the faculty members in the university of Peradeniya, Sri Lanka: a user survey, *SRELS Journal of the Information Management*, 49(5), pp.501-510.
- Christina K. Pikas. (2006) The impact of information and communication technologies on informal scholarly scientific communication: a literature review University of Maryland College of Information Studies Informal Scholarly.
- Cullen, Rowena, Calvert, Philip J. Stakeholder (1995), perceptions of university library effectiveness, *Journal of Academic Librarianship*, 21, pp.438-446.
- D'Elia, George, and Eleanor Jo Rodger (1996), Public Library roles and patrons use: Why patrons use the library, *Public Libraries*, 33, pp.135-144.
- Das, Suchitra (2000), Information Resources on Internet and Information services in Library and Information Centers, *SRELS, Journal of Information management*, 37(1), pp.49-58.
- Date, Dhanashree A. and Gokhale, Pratibha A (1999), Implementation of ISO 9000 in Industrial Libraries, *Library Science with a Slant to Documentation and Information Studies*, 36(2), pp.65-72.
- Derfert-Wolf, Lidia and Gorski, Marek M. and Marcinek, Marzena (2005), Quality of academic libraries - funding bodies, librarians and users perspective: a common project of Polish research libraries on comparable measures. In: proceedings 71st IFLA General Conference and Council, Oslo (Norway).
- Doraswamy,M (2007). Knowledge and use of digital library resources by engineering faculty members affiliated to Acharya Nagarjuna University,A P.Pearl, *Journal of Library and Information Science*, 1(3), pp.32-39.
- Doraswamy,M (2012) Information use pattern towards library services and facilities by the faculty ,members of Siddhartha Educational Institutions Vijayawadha,Andhra Pradesh: a study *International journal of Information Dissemination and Technology*, 2(3), pp.176-181.

- Dow, Ronald F (1998), Using assessment criteria to determine library quality, *Journal of Academic Librarianship*, 24(4), pp.277-291.
- Foster, M.B. (1989). A study of use of information sources by social science researchers. *Journal of Academic Librarianship* 15(1), pp.7-11.
- Gayatri Mahapatra. (2006) Information needs of scientists and engineers in electronic environment: a case study of Indian exploration and production industry, *Annals of Library and Information studies*, 53(4), pp.173-183.
- Gill, Jatindar Singh & Gurpreet, Singh. (2004) Information needs of research scholars in the faculty of Life Sciences, Guru Nanak Dev University, Amritsar: a survey, *Library Progress*, 24(2), pp.121-30.
- Golnessa Galyani Moghaddam., & Talawar, V.G. (2008) The use of scholarly electronic journals at the Indian Institute of Science: a case study in India. *Interlending & Document Supply*, 36(1), pp.15–29.
- Guruprasad, R. & Khaisar Nikam. (2011) Use Patterns of Electronic Information Resources : By Aerospace Scientists and Engineers in Bangalore, India (paper back pp.540) VDM Verlag Dr. Muller. ISBN 978-3639321043.
- Guthrie, Kevin M. (2002) Lessons from JSTOR. User Behaviour and faculty Attitudes. *Journal of Library Administration*, 36(3), pp.109-120.
- Halima St Egberongbe (2012), Quality management in academic libraries in Nigeria.
- Haruki Nagata, Yoshinori Satoh, Sarah Gerrard, Päivi Kytömäki, (2004), The dimensions that construct the evaluation of service quality in academic libraries, *Performance Measurement and Metrics*, 5(2), pp.53 – 65.
- James A. Church (2004), filling in the gaps: Issues and strategies for collection development in United Nations Depository Libraries, *Journal of Government Information*, 30, pp.8–19.
- James Hooks, Carl Rahkonen, Chris Clouser, Kelly Heider, Rena Fowler (2008), Information Literacy for Branch Campuses and Branch Libraries, *Library philosophy and practice*.
- James T Mellon & David J Williams (2010), Applying best practices in web site redesign: the Queens College Libraries experience, *Educational Technology Papers. OCLC Systems Services*, 26(3), pp.177-197.
- Jeannette Ho and Crowley, Gwyneth H (2003), User perceptions of the ‘reliability’ of library services at Texas A&M University, *Journal of Academic Librarianship*, 29(2), pp.82-87.
- Karen Calhoun (2002), from information gateway to digital library management system: a case analysis, *Library Collections, Acquisitions, and Technical Services*, 26(2), pp.141-150.
- Kevin McGarry (1975), *Computational knowledge and the Librarian*, London, Clive Bingley.
- Khan, Abdul Mannan & Naved, Ahmed (2009) Use of e-journals by research Scholars at Aligarh Muslim University and Banaras Hindu University, *The E-Library*, 27(4), pp.108-117.
- Kiran Kaur, Pauziaah Mohamad, Sossamma George (2006), Quality management service at the University of Malaya Library, *Library Management*; 27(4/5).
- Kristin J. Henrich and Ramirose Attebury (2010), Communities of practice at an Academic Library: A New Approach to Mentoring at the University of Idaho, *The Journal of Academic Librarianship*, 36(2), pp.158-165.
- Landrum, Hollis Land and Prybutok V. R. (2003), Service quality and success model for the information service industry, *European Journal of Operational Research*, pp.63-74.
- Lindauer, Bonnie Gratch (1998), Defining and Measuring the Library’s impact on campus wide outcomes, *College and Research Libraries*, pp. 546.
- Li-Shan Chen (2008), Design and implementation of intelligent library system, *Library Collections, Acquisitions, and Technical Services*, 32(3-4), pp.127-141.
- Manorama Tripathi and Sunil Kumar (2010), Use of Web 2.0 tools in academic libraries: A reconnaissance of the international landscape, *The International Information & Library Review*, 42(3), pp.195-207.
- Marcos Andre Goncalves and Barbara Moreira (2007), what is a good digital library, A quality model for digital libraries, *Information Processing & Management*, 43(5), pp.1416-1437.
- Margam Madhusudhan. (2008) Use of UGC-Infonet e-journals by research scholars and students of the University of Delhi. Delhi: A study, *Library Hi Tech*, 26(3), pp.369–386.
- Mark H. Needleman (2007), the NISO Web Services and Practices Working Group, *Serials Review*, 33(2), pp.143-144.
- Marulli, L. (1979), Documentation of the United Nations system: Coordination in its bibliographic control, Metuchen, NJ: Scarecrow Press.
- Miranda, Sylvania V, Tarapanoff, Kira M.A. (2008) Information needs and information competencies: a case study of the off-site supervision of financial institutions in Brazil. *Information research* .13(2).
- Mohamed Haneefa, K., & George, Sheerna. (2010) Web based information retrieval pattern of doctoral students in Calicut University, *Annals of Library and Information studies*, 57, pp.394-402.
- Muhammad Tahir, Khalid Mahmood, Farzana Shafique (2008), Information Needs and Information-Seeking Behavior of Arts and Humanities Teachers: A Survey of the University of the Punjab, Lahore, *Library philosophy and practice*.
- Nancy Courtney, Fred W. Jenkins (1998), Reorganizing Collection Development and Acquisitions in A Medium-Sized Academic Library, *Library Acquisitions: Practice & Theory*, 22(3), pp.287–293.

- Nancy H. Dewald (1999), Transporting good library instruction practices into the web environment: An analysis of online tutorials, *The Journal of Academic Librarianship*, 25(1), pp.26-31.
- Nayana Darshani Wijayasundara (2008), Faculty - Library collection: A model for University of Colombo, *The International Information & Library Review*, 40(3), pp.188-198.
- Niruba Sethukumari,S., & Thirumagal. A. (2012) Use of Digital resources of Kerala Institute of Tourism and travel studies library, *SALIS Journal of Information Management and technology*, 3(1), pp.63-67.
- Opeke, Rosaline., Osunkunle, Sola & Okwilagwe, O.A. (2002) Information sources and utilization patterns of pharmaceutical scientists in Nigeria, *African Journal of Biomedical Research*, 5, pp.137–140.
- Panda, K. C and Swain, & Dillip K (2011), E-newspapers and e-news services in the electronic age: an appraisal, *Annals of Library and Information Studies (ALIS)*, 58 (1) pp.55-62.
- Parameshwar S., &Patil.D.B.(2009) Use of the internet by faculty members and research scholars in Gulbarga University Library. *Library Philosophy and practice*. ISSN 1522-0222. <http://unlib.unl.edu/Lpp/parameshwar.htm>.
- Parasuraman. A.,Valarie, Zeithaml, and Leonard L. Berry (1988), SERVQUAL: A multiple-item scale for measuring consumer perceptions of service quality, *Journal of Retailing*, 64, pp.12-40.
- Paul B. Wiener (1982), Recreational reading services in academic libraries: An overview, *Library Acquisitions: Practice & Theory*, 6(1), pp. 59-70.
- Pawan R. Agrawal (2011), Application of 'Six Sigma' in Libraries for Enhancing Service Quality, *International Journal of Information Dissemination and Technology*, 1(4), pp.203-206.
- Pedramnia,S, Modiramani,P etal., (2012), This paper was originally presented at the QQML Conference in Athens, Greece between, pp.24-27.
- Peter Brophy (2008), telling the story: Qualitative approaches to measuring the performance of emerging library services, *Performance Measurement and Metrics*, 9(1).
- Peter Hernon (2002), Outcomes are key but not the whole story, *The Journal of Academic Librarianship*, 28(1-2), pp.54-55.
- Peter Hernon (2002), Quality: new directions in the research, *Advances in Library Administration and Organization*, 26, pp.317-348.
- Powell, Ronald R(1992), Impact Assessment of University Libraries, *Library and Information Science Research*, 14, p.254.
- Rabinarayanan Misra.(2011) Information Use Patterns by Scientists: A Case Study of NEIST, Jorhat, North East India, *Library Philosophy and Practice* (e-journal). Paper 590 ISSN 1522-0222. <http://digitalcommons.unl.edu/libphilprac/590>.
- Robert Danielson (2012), A dual approach to assessing collection development and acquisitions for academic libraries, *Library Collections, Acquisitions, & Technical Services*, 36, pp.84–96.
- Shalini, Singh (2012), Right to Information and Information Literacy: An Indian Perspective, *SRELS, Journal of Information Management*, 49(1), paper-A, pp.5-19. sheffieldschoolresearchers.blogspot.com/.../quality-management-in-a.
- Shera, Jesse Hauk (1999), In American National Biography, 19, New York: Oxford University Press, pp.215-226.
- Shera, Jesse Hauk (1999), In American National Biography, 19, New York: Oxford University Press, pp.135-146.
- Shiva Kanauja Sukula., & Neeraj Malik.(2011). E-journal growth, usage and pattern study at Ch. Charan Singh University Library, *Information Age*, 5(1), pp.7-12.
- Shukla, Akhandanand & Tripathi, Aditya (2010), Establishing content awareness evaluation criteria for library websites: a case study of Indian academic library websites, *Annals of Library and Information Studies (ALIS)*, 57(4), pp.403-416.
- Snoj, Boris and Peremanes, Zdenka (2001), Let users judge the quality of faculty library services, *New Library World*, 102(1168), pp.314-324.
- Somaratra, Sajeewanie D. & Peiris, Colin N. (2011), Service quality in University of Colombo libraries: an assessment, *Annals of Library and Information Studies (ALIS)*, 58(2), pp.170-183.
- Sunil Tyagi (2011) Scientist perception of use of electronic Information resources a case study of pharmacopoeia laboratory for Indian medicine, *India Philosophy and practice*, Annual Volume, ISSN 1522-0222.Report No.9.
- Surender, H.S. Chopra (2011), Digitization of Resources in University Libraries in India, *International Journal of Information Dissemination and Technology*, 1(3), pp.128-137
- Suvra Chandra (2012) A survey of use of electronic resources at Narula Institute of technology Library and Documentation centre, *SRELS Journal of Information Management*, 49(5), pp.569-575.
- Tapas Kumar Ghosh, K.C. Panda (2010), Library Collections, Acquisitions, & Technical Services, 34, pp.45–50.
- Thanuskodi, S (2011) User awareness towards using information and communication technology (ICT) in government arts and Science Colleges in Southern Tamil Nadu: An analytical study. *International Journal of Science and Technology Education Research*, 2(6), pp.98–105.
- Thanuskodi, S (2012) Awareness of web2.0 among participants of the 3rd LIS refresher course in Bharathidasan University. *SRELS Journal of Information Management*, 49(6), pp.655-661.
- Thanuskodi.S, & Ravi.S.(2011) Use of digital Resources by Faculty and Research scholars of Manonmaniam

- Sundaranar University, Tirunelveli, *DESIDOC Journal of Library & Information Technology*, 31(1), pp.25-30.
- Tilwani, T.D., & Satish Kumar. (2007) Information use pattern of social scientists from web –based Information Resources, *A pilot study-ILA Bulletin*, 43(4), pp.16-24.
- UN Dag Hammarskjöld Library (1995), Principles governing United Nations Depository Libraries, New York, United Nations (ST/AI/189/Add.11/Rev.2. Masthead.
- UN Department of Public Information (2003), The United Nations system: Principal organs of the United Nations. New York: United Nations (DPI/2299).
- UN Department of Public Information (2003), United Nations publications catalog, New York: United Nations.
- Verma, R. K. (2002), Measuring quality management level with reference to ISO 9000 and TQM for special libraries in India, *Annals of Library Science and Information Studies*, 49(4), pp.141-163.
- Vijayakumar, M., Kannappannavar., Jnana Sahyadri., & Samir Kumar Jalal (2009) Use of Library services in Technologically Changing environment: a survey, *SALIS Journal of Library and Information Science*. 1(1), pp.19-25.
- Walmiki, R.H. Ramakrishnegowda, K.C. & Prithviraj (2010), Awareness and use of UGC-Infonet digital library consortium by the faculty members of Karnataka state universities, *Annals of Library and Information Studies (ALIS)*, 57(1), pp.33-43.
- Wilson. T.D (1981), one user studies and information needs the journal of documentation, 37(1), 3-15.
- Wyoma van Duinkerken (2009), Bringing public services experience to technical services: Improvements in practice, *Library Collections, Acquisitions, and Technical Services*, 33(2-3), pp.51-58
- Wysoki, A. (1989), A study of Users Information Needs: Subject and Methods in International Federation for Documentation on Theoretical Problem of Informatics, Moscow, All Union Institute for Scientific and Technical Information, pp.69-75.