3.1 Introduction

The review of literature is an essential component of any research investigation as it gives necessary input to the investigator to frame the research study on the chosen topic. It enables the researcher to indentify the unexplored areas, in order to create new grounds for research. In the present case, related literature has been collected from various sources such as conference proceedings, journal articles, thesis, reports, websites as well as online bibliographic and full-text databases. Contacts with the colleagues, email discussion lists and other appropriate sources have also been used to acquire the knowledge about actual work done so far in this research area. In India, several studies have been carried out so far to study extensively the state of the awareness, use and impact of e-resources available either through UGC-INFONET Consortium or other consortia by member libraries. Very few studies have been carried out to find out whether the availability of e-resources through INDEST-AICTE Consortium to the engineering colleges has made any significant impact on the research productivity of these colleges regarding the quantity and quality of publications, the value for money invested on subscription of e-resources and the factors that are important to cost-effectiveness of consortia-based subscription to e-resources eg. Cost avoidance; Cost recovery; Cost savings; Average cost of downloaded articles etc. Research on determining the effectiveness of member libraries in terms of the aforesaid topics is still in its infancy. In this chapter, an attempt has been made to provide an overview of various aspects and issues of this study through a review of literature.

3.2 Studies related to INDEST-AICTE Consortium

Arora (2003) studied efforts made by Indian libraries and institutions towards formation of consortia of libraries for buying access to electronic resources. He discussed about proposed strategic cooperation called the “Indian National Digital Library in Engineering Science and Technology” (INDEST) which is based on five proposals submitted to three major Ministries/Departments of the Government of India, namely, the Ministry of Human Resources Development (MHRD), the Ministry of Information Technology (MIT), and the Department of Biotechnology. He has
opined that the INDEST is proposed to function as a consortium of engineering and technological libraries for nurturing core digital collections in the fields of engineering and technology. He was of the view that the INDEST would bring together institutions receiving financial support from these three Ministries/Departments of the Government of India. He also desired that the INDEST would host a variety of web-based digital resources including those available through national and international agencies with consortia and national licences to provide access to authorized users in India. Besides, the INDEST would also provide document delivery services, create and archive digital collections, facilitate shared storage and preservation, adopt common bibliographic formats to facilitate data exchange, and promote common library systems in India. The structure, services, and benefits of INDEST have also been discussed in detail in his study.

Arora and Agrawal (2003)² introduced the INDEST Consortium, its genesis, needs and benefits. It described criteria used for selection of e-resources, and their evaluation. The study provided a detailed analysis of electronic resources being subscribed by various categories of institutions. The study presented an analysis on expenditure according to category of institutions, type of resources, and ratio between list price V/s consortium price. The study deliberated on important terms of license agreements for subscription to e-resources proposed by the consortium. Lastly, the authors described activities and services and its future plans. Further, the study has shown that the rates offered to the consortium are lower by 50% to 90% depending upon the category of institution. It has further stated that full-text resources and databases proposed for subscription for various categories of institutions in the consortium costed ₹ 164 crores as per their list price, while through the consortium the total cost had come down to ₹ 18.60 crores for all institutions being considered under the consortium. Overall there was a total saving of ₹ 145.60 crores.

Guha and Arora (2003)³ focused on about the activities of the INDEST Consortium, its future plans and structural/functional model. The concept of ‘INDEST Extended’ has been highlighted with emphasis to JCC@INDEST, creation of full-text ETDs database and UNION OPAC.
Saibaba and Guha (2004) provided an overview of the approach that INDEST Consortium had taken to promote consortia based resource sharing among the member libraries. The study also presented the infrastructure available with IIT Guwahati for delivering these benefits to its users.

Arora (2005) studied library consortium and outlined its needs and benefits. He explained types and models of library consortium and prevalent pricing model offered to the library consortium. Steps involved in the process of forming a consortium and managing a library consortium and e-resources through it were described in detail. He further discussed briefly major activities, services and criteria for a successful library consortium with examples.

Singh (2005) studied about research productivity of IITs as regards to the number of quality publications. For this study, he selected libraries of seven IITs viz. IIT Bombay, IIT Delhi, IIT Gauhati, IIT Kanpur, IIT Kharagpur, IIT Madras and IIT Roorkee. In this comparative study, he found that the impact was higher in case of IIT Roorke and IIT Gauhati. Lastly, he concluded that availability of e-resources through INDEST-AICTE Consortium definitely made a positive impact on the number of quality papers in case of seven IITs.

Prasad (2005) identified some software tools like Z39.50, OAI-PMH and Fulltext OpenURL for managing consortial resources which could be implemented for building cost-effective and viable consortia without much financial expenditure.

Vinod (2005) also carried out a questionnaire based users survey to find the use and usage of e-journals of the INDEST-AICTE CONSORTIUM by the faculty members, research scholars, post graduates (PG) and under graduates (UG) at Indian Institute of Technology Kharagpur, India. One of the major findings of the study was that “78 percent faculty members, 92 percent research scholars and 100 percent PG students were regularly accessing and using e-journals for their study”.

Arora and Trivedi (2010) described major functions, activities and services of the INDEST-AICTE Consortium. They focused upon resources made available, terms of licenses, policies and practices for archival back-ups, membership programmes including core members, AICTE-supported institutions, and self-supported category of membership. The study outlined governing structures of the Consortium and their
roles. They further elaborated on strategies used for effective implementation of Consortia amongst member institutions. The study also briefly touched upon the economics of the INDEST-AICTE Consortium. Lastly, the study elaborated on future endeavors of the INDEST-AICTE Consortium.

Sahoo and Agarwal (2012) have discussed various consortia operating in India, the inception of INDEST-AICTE Consortium, objectives, administrative structure, membership, services, and activities of INDEST-AICTE Consortium. They have also discussed the selection of e-resources, review of e-resources, license agreement with publishers, fair use, usage analysis of various e-resources, economics of expenditure, research output of core members, archival access of e-resources for the core as well as other member of the consortium and future plan for the consortium.

3.3 Studies Related to Use and Impact, Usage and other Related Topics:

Akasawa and Ueda (1998) examined the usage of electronic resources by a specific academic community in Japan. The study found that only about 31 percent of the respondents used electronic journals at the time the survey was carried out, but about 75 percent of the respondents perceived this medium was of high value.

Cowhig (2001) proposed that “publishers should work together to certify and publish key usage statistics relating to electronic scientific, technical and medical (STM) periodicals. The study described the main features of the Electronic Article and Journal Usage Statistics (EAJUS) system that provides a standardized, audited and published set of statistics covering the user-ship of periodical in the entire customer base and not centered on a single institution”.

In addition to above there are several other studies, which are worth mentioning here.

Liu and Cox (2002) said that “tracking electronic journals to collect usage statistics is no easy task, especially as publishers and aggregators use various standards to create usage reports”. The authors described a successful cooperative system developed at the University of Louisville, USA.
Birdie and Alladi (2002) observed that “the phenomenon of consortia or group of libraries buying e-information together has become very important in the last few years. This new scenario, along with new forms of purchasing and selling e-information, has led to new pricing models that have not yet been resolved”. This survey study determined the cost-per-serial-use by discipline and the rate of use per student.

Tripathy, Patra and Choudhury (2004) explained the need, role and benefits of academic library consortia. They also discussed the problems and difficulties associated with building consortia.

Conyers (2004) pointed out that cost per use should be an important parameter in making decision on renewal of the subscription of e-resources.

Moen et al. (2004) justified the calculation of cost per download in understanding the usage of e-resources.

Gulati, Anjali (2004) discussed the status of information and communication technologies usage in Indian libraries with special reference to special libraries and the efforts made by various institutions to propagate e-information products and services. The study highlighted the consortia efforts in India like JCCC Consortium, INDEST Consortium, CSIR E-journal Consortia, and UGC Infonet. The study further discussed digitisation efforts in India at NISCAIR, New Delhi, IIITM, Kerala, C-DAC Pune, and the Digital Library of India. In addition it incorporated details on major information systems in India (such as NISSAT) and major library networks in India (such as INFLIBNET, DELNET, CALIBNET etc.). Lastly, the study concluded with mentioning challenges for library and information science professionals and an overview of initiatives taken by Government of India.

Mounissamy and Rani (2005) clearly briefed the usage and usability of electronic journals by research scholars and faculty members of National Institute of Technology, Tiruchirappalli. The study revealed that 67 percent of researchers and 33 percent of faculty members regularly accessed and used the electronic journals for varied purposes.

Devi and Murthy (2005) described definitions, aim, organizations, internal structures, policies and other characteristics of the UGC-Infonet E-Journal
Consortium which is one of the well known consortia for Higher Education in India under the UGC. The study also highlighted the characteristics and issues faced by the consortia and the measures taken up to promote consortium activities.

**Carroll (2006)** reported usage of e-resources at Oregon Health and Science University in terms of number of downloads, formats of downloads, cost per use, number of requests from faculty, interlibrary loan requests, and number of articles written or cited by the faculty.

**Poll and Payne (2006)** showed methods that were tested and used at the present. More investigation was needed to identify methods that could be used to show a library’s overall impact or to develop measures that would permit benchmarking between institutions.

**Beard et al. (2007)** in their study on, “The impact of e-resources at Bournemouth University 2004/2006” observed that the use of, and enthusiasm for, electronic resources was widespread amongst students and staff of Bournemouth university (UK).

**Khaiser and Pramodini (2007)** described the use of e-journals and databases by the users of University of Mysore and examined the utilization and satisfaction levels of users with respect to the e-resources. Use of internet as an alternative to UGC-Infonet consortium resources was also presented.

**Vishala and Bhandi (2007)** advocated for a centrally administered consortium approach with innovative features for maximum utilization of UGC-INFONET electronic resources by the research community.

**Patil and Parameshwar (2007)** revealed in their study that UGC Infonet Consortium was much helpful in fulfilling their information needs. They arrived at the conclusion that there was need to train the faculty members and research scholars in using the UGC-Infonet Journals. Lastly, they concluded that more number of journals should be included in the consortium.

**Lobo and Bandi (2007)** highlighted the meaning, resources for forming consortia, problems, benefits, objectives, types of consortium for e-journals, growth in India and at international level, HELINET consortium, advantages and disadvantages. The
study further suggested that the Libraries should join together to minimize the cost of acquisition and also to maintain e-resources by maximizing their utilization through consortia.

Murthy (2008)\textsuperscript{28} conducted a study regarding usage of UGC-Infonet resources and found that the trend of high use of e-resources by the Indian scholars helped in reducing information gaps between rural and urban, privileged and less privileged, reachable and unreachable frontiers within the country. He further opined that this had revolutionized the Indian university campuses with a digital culture.

Madhusudan (2008)\textsuperscript{29} conducted a study on use of UGC-Infonet e-journals in university of Delhi. The study showed that majority of respondents used UGC Infonet e-journals and there was an increasing demand for subscription of more e-journal titles in LIS. There appeared to be some need for academics to be provided with training in using e-journals.

Veenapani, Singh and Devi (2008)\textsuperscript{30} conducted a study to determine the use of UGC-Infonet Digital Library Consortium by teachers and researchers and revealed that only 55 percent of them were aware of the consortium. They further pointed out to the problems faced by the users of the consortium namely ICT illiteracy, frequent power cuts, slow internet speed, insufficient number of computers and problems in selection of desired titles of journals.

Chand and Nishy (2008)\textsuperscript{31} examined the changing face of libraries particularly with regard to the journal subscription from print to electronic form through formation of consortia and necessity for enhancing the journal subscription.

Dutta (2008)\textsuperscript{32} in his report “Access to electronic journals through CSIR consortia: A case study at Central Glass and Ceramic Research Institute” dealt on access to electronic journals through CSIR consortia. The study highlighted the advantages of consortia.

Pesch (2008)\textsuperscript{33} affirmed the importance of calculating cost per search in understanding usage of e-resources.

Singh, Nazim and Singh(2008)\textsuperscript{34} conducted a survey to know the awareness and use of e-resources of UGC-INFONET Consortium by faculty members, researchers
and students. They found that mere 14.29% were not aware of the availability of online journals. Majority of the respondents (58.57%) were using online journals for research work, 32.86 percent to update subject knowledge, 27.14% for writing papers and 15.71% for teaching.

**Kaur and Verma (2009)** focussed on use of electronic information resources at Thapar University, Patiala and showed the increasing trend in the use of e-journals. They attempted to study the issues like use of electronic information resources, its impact on the collection of print and electronic journals, its awareness among the users, and the places the users were accessing these resources. A survey was conducted in the academic year 2006-07 at the Thapar University, Patiala. A total number of 504 users from the undergraduate, postgraduate programme, research domain and faculty was selected and their response was obtained with the help of questionnaire. The findings showed that users from all these categories were using e-resources. The awareness about e-resources encouraged users to use such resources to the maximum and the users were using computer centres and hostels more for accessing the information.

**Patil and Parameshwar (2009)** found that 64.29 percent of the faculty members needed regular training / awareness / orientation programmes for making best use of the UGC-Infonet Digital Library Consortium.

**Bhatt and Joshi (2009)** evaluated the impact of UGC-Infonet Digital Library Consortium on academic community and revealed that the number of research degrees awarded in the field of social sciences, humanities, pure and applied sciences had increased significantly.

**Murthy (2009)** briefly discussed the consortia initiatives taken at Defence Research and Development Organisation (DRDO), a premier research organisation of Ministry of Defence, engaged in the indigenous development of cutting-edge defence technologies. He stated that DRDO consortium has already made a positive impact on the minds of the R&D community of DRDO. He suggested that on the economic side, DRDO laboratories could save nearly ₹ 3 crore by availing of deep discounts offered for print copies and by not subscribing to print copies. He also observed that DRDO laboratories were having greater resource sharing amongst
them and providing increased access to latest R&D developments on 24X7 basis to the S&T community on their desktops with an improved, qualitative and effective article delivery service.

*Ratnakar, Prerna and Satyanarayan (2009)⁴⁹* gave an overview of the consortia initiated by the Indian Council of Medical Research which shared the resources of its medical libraries among its 25 institutes. He also suggested that Indian librarians should seriously rethink and reinitiate consortium movement like western countries for maximum utilisation of resources at a reduced cost, time, and space.

*Ghosh (2009)⁴⁰* included a brief profile of selected engineering libraries in Maharashtra state of India and discussed salient issues related to strategic cooperation and consortia, with particular focus on the current situation. It examined the structural, financial and technical factors that had compelled the academic libraries to think about the formation of statewide consortia. The author surveyed forty-nine libraries to get an idea about the current status and explored the possibilities of forming regional consortia with a mission to enhance access to information and knowledge through cooperation for benefit of the engineering communities. The focus was on librarians’ perceptions/opinions on the formation of state level consortia ICT infrastructure, users’ needs, collection development policies and the services provided by engineering libraries to the community.

*Kumar (2009)⁴¹*’s study dealt with use and usage of e-resources by the members of FIIB. He gave description about the FIIB library and its resources. He explained the need, scope and limitation, methodology of the study. The study included data analysis, summarizing of findings, and also suggestions for the improvement in the usage of e-resources.

*Walker (2009)⁴²* suggested that usage statistics and cost per use could offer a viable solution to the ever-shrinking budget of libraries and making judicious purchase decisions. Education administrators and planners are keen to assess per capita return on the investment in library.

*King (2009)⁴³* recommended that libraries should calculate cost per download and compare this parameter with other libraries. The cost per download, per session or per login had been referred to frequently during cost-benefit analysis of e-resources.
Cost per download can be defined as cost involved each time a resource is downloaded from a specific database.

Trivedi, Chauhan and Arora (2009)\textsuperscript{44} studied on “Economics of UGC-INFONET Digital Library Consortium”. The study elaborated on economics and cost-effectiveness of Consortium. It highlighted the measures taken to ensure optimal use of electronic resources provided to the member libraries.

Bhatt (2010)\textsuperscript{45} opined that UGC-Infonet Digital Library Consortium was the most important consortium providing access to a large array of e-resources to all academic universities and colleges in India. In fact, it facilitates efficient and effective usage of e-resources for teaching and research activities.

Walmiki, et.al (2010)\textsuperscript{46} surveyed and disclosed that less than 40% of the faculty members of Karnataka state universities were aware of and use the UGC-Infonet online resources and more than 60% were not using the resources. The study further suggested for an urgent need on the part of UGC to review the resources included in the consortium in order to fulfill the needs of the faculty members.

Mishra and Gohain (2010)\textsuperscript{47} presented research topic “Use and Usage Statistics of Electronic Resources at Central Library Tezpur University: A Case Study”. The study attempted to find out the use of e-resources available in the Central Library, Tezpur University by the user community. The findings will facilitate the researcher to find out the relevance and length of the e-resources services provided by Central Library, Tezpur University as well as the Librarians to compare usage statistics from different vendors; derive useful metrics such as cost-per-use, make better-informed purchasing decisions and plan infrastructure more effectively.

Veeramani and Vinayagamoorthy (2010)\textsuperscript{48} examined the need and necessity of electronic collections, University libraries and its impact on management graduates. The study also identified the level of awareness among the graduates and their usage pattern on using digital information.

Arora and Trivedi (2010)\textsuperscript{49} described major activities, operations, and services of UGC-INFONET Digital Library Consortium. The study briefly described resources subscribed, major items of negotiation and terms of license, core member universities and associate members, access management technologies, etc. The
study outlined governing structure, committees, participating universities/institutions and their roles. They further elaborated on methods used for promotion of e-resources amongst member universities. The study briefly touched upon the economics of the UGCINFONET Digital Library Consortium and outlined model for implementation of college consortium. Lastly, the study elaborated on future endeavours of the UGC-INFONET Digital Library Consortium.

Godwa (2010)\(^{50}\) concentrated on the growth, and development of higher education in India during the period 1947-2006. The study highlighted the implementation of recent technologies and ICT applications and need based requirements for resource sharing. He also discussed about UGC-INFONET’s genesis, activities and services. In the process of improving the quality of higher education, the UGC decided to subscribe to e-journals and provide access to Indian universities and colleges. The UGC has also initiated a program providing Internet access to scholarly literature in all areas of learning.

Walmiki, Ramakrishnegouda and Prithviraj (2010)\(^{51}\) had conducted a study with reference to Karnataka State to assess the awareness and use of UGC–INFONET digital library consortium by the faculty members of state university libraries. They found that 39.79% of the faculty members were aware of and use consortium resources whereas 35.99% were aware but do not use and 24.22% were not aware of the availability of the consortium resources. The major problems faced by the users of the consortium included lack of knowledge to use, insufficient INTERNET terminals, bandwidth problem and lack of availability of relevant information sources.

Singh, Singh and Chandel (2010)\(^{52}\) attempted to find out the usage of e resources of various publishers available under UGC-INFONET by the academic community of Manipur University during 2007 and 2008. They suggested that there was a need to find out the usage of individual product of the publisher in view of findings that the larger the coverage, least the use.

Vij and Soni (2011)\(^{53}\) described major functions, activities and services of the INMAS library. The study briefly touched upon both print and e-resources subscribed by INMAS library. The study further outlined activities undertaken by
INMAS library which were leading to cost saving and cost recovery, thereby, increasing return on investment (ROI). He also elaborated on strategies used by INMAS library for effective promotion for increased utilization of its resources, which would in turn result in increased research output in form of various products and services and a better ROI. Lastly, the study elaborated on future endeavors of the INMAS library which would ultimately result in increased ROI for the library.

Tripathi, Kumar and Jeevan (2012)\textsuperscript{54} studied an account of how the e-resources in general and EBSCO, PROQUEST, Project MUSE, and JSTOR in particular were used in the Indira Gandhi National Open University, New Delhi, India. They studied and highlighted the access pattern of the patrons in an open university. The study advocated for the consistency and uniformity in computing and presenting usage statistics reports so that reports from various providers could be compared.

Goria, Sunil (2012)\textsuperscript{55} provided brief overview of popular library consortiums of India. The study also described the techniques to increase utilization of the e-resources. Various emerging technologies i.e. RSS feeds, Google Reader, Delicious etc have been demonstrated practically for effective utilization of e-resources with minimum efforts. Findings of this study highlighted emerging technologies and role of consortia for effective use of e-resources in Indian libraries.

It is obvious from literature review that though the studies have been carried out to awareness and use of UGC-INFONET resources, such studies were restricted to academic community of single university, and not explorative in nature. Thus the present study attempts to fill-up the gap.

### 3.4 References


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