2.1 Introduction

The purpose of this chapter is to discuss the sources and methods used in the present study by the researcher. Both quantitative and qualitative data have been collected. The data collected have been analysed using the Statistical Package for Social Sciences (SPSS) programme, Version 20.0 and Microsoft Excel 2007. Further, the scope and limitations of the study have also been discussed in this chapter.

2.2 Title of the Study

The topic of the present study is “Role and Impact of INDEST-AICTE Consortium in Libraries of Engineering Colleges of Madhya Pradesh and Uttar Pradesh: A Study”

2.3 Statement of the problem

Due to rapid strides in the field of Information and Communication Technologies (ICTs), academic libraries have shifted from print format to electronic format in order to meet their users’ needs in digital environment. Electronic resources have had a significant growth in these libraries are as far as the library collections are concerned. Engineering colleges have been spending huge amounts in the development of e-resources in their libraries. It is important to make an in-depth study of the use of INDEST-AICTE Consortium to evaluate the services provided through it and further assess to evaluate how libraries and their users are being benefited from it.

But without conducting a study, there is no way of knowing whether the users accept them or not; whether they find the e-resources easy to use, reliable, and useful? It is very important know whether the e-resources effectively are being used or not? It is important to understand how these e-resources are being utilized by their users. Keeping these things in mind, the present study entitled “Role and Impact of INDEST-AICTE Consortium in Libraries of Engineering Colleges of Madhya Pradesh and Uttar Pradesh: A Study” is carried out to see the volume and usage of e-resource on which they invest a huge amount.
The study aims to measure value for money invested on subscription of e-resource in terms of Usage of e-resources (in terms of number of downloads), Cost avoidance; Average cost of downloaded articles, Cost recovery and Cost savings as well on Research output in terms of number of publications.

So far, very few institutes' libraries have undertaken a study as such to ascertain the effectiveness of the e-resources and its impact in terms of cost saving, number of publications and its usage. It has therefore been thought to conduct the study for the aforesaid purpose.

### 2.4 Scope and Limitation of the Study

The scope of the present study is limited to the libraries of engineering colleges of Madhya Pradesh and Uttar Pradesh which are the members of the INDEST-AICTE Consortium. At the time of conducting the study, there were 20 and 45 engineering colleges in Madhya Pradesh and Uttar Pradesh respectively having membership of INDEST-AICTE Consortium\(^1\). 10 engineering colleges from Madhya Pradesh and 15 engineering colleges from Uttar Pradesh have been considered on the basis of Ranking of Colleges Based on B.Tech Theory Exam Performance. 6 (60 per cent) engineering colleges out of 10, and 11 (73 per cent) engineering colleges out of 15 engineering colleges have been taken into consideration for the present work respectively. 4 engineering colleges each have been dropped from Madhya Pradesh and Uttar Pradesh respectively, as they did not respond by the filling up the questionnaire.

In effect, a total of 17 (68 per cent) out of 25 engineering colleges from Madhya Pradesh and Uttar Pradesh have been selected for the sake of the study.

The selected colleges are further grouped into ‘AICTE-Supported’ (Govt. College) and ‘Self-Supported’ (Private Colleges). The details are given in chapter 5.
Table 2.1
Respondents Description

<table>
<thead>
<tr>
<th>State</th>
<th>Circulated</th>
<th>Actual Received</th>
<th>Response of (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Madhya Pradesh</td>
<td>10</td>
<td>6</td>
<td>60%</td>
</tr>
<tr>
<td>Uttar Pradesh</td>
<td>15</td>
<td>11</td>
<td>73%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>25</strong></td>
<td><strong>17</strong></td>
<td><strong>68%</strong></td>
</tr>
</tbody>
</table>

The study has considered the usage of only three e-resources namely ASME, ASCE and IEEE-IEL Online which are subscribed by most of the engineering colleges through the consortium and they are frequently used and most preferred by users. Their usage for Core members, AICTE-supported and Self-supported members of the Consortium has for the last 12 years, i.e. from 2003 to 2014, been studied for measuring its impact in India in terms of usage, average cost per download, cost recovery and number of publications. However, the data was available only for Self-supported and AICTE-supported members from 2008 to 2014 for measuring the impact in libraries of engineering colleges of Madhya Pradesh and Uttar Pradesh. The secondary data used in the present study has been taken from the annual reports of INDEST–AICTE Consortium.

The primary data of the present work has been collected through questionnaire from faculty members and librarians of engineering colleges of Madhya Pradesh and Uttar Pradesh to assess and evaluate how libraries and users are getting benefited by the consortium and further evaluate the use of electronic resources among 17 selected libraries and their users.

2.5 Research Methodology Adopted for Present Work

Research methodology helps to conduct the research in a systematic and logical way. The entire research work depends upon the methodology being used. If research methodology is not implemented in the correct way, the result of research may be deceptive. The methodology adopted for the present work is presented in Fig. 2.1
Fig. 2.1 Research Methodology Adopted for Present Work
2.5.1 Literature Review

The literature is an important part of any research to identify the gaps for the work. In the present study 175 research articles and papers from different sources of repute have been reviewed. The details of relevant literature have been presented in the chapter 3.

2.5.2 Objectives of the Study

Based on the insights gained from review of literature, following objectives are identified for the present work.

- To assess and evaluate how libraries and users are being benefited from INDEST-AICTE Consortium.
- To know the extent of awareness and use of the INDEST-AICTE Consortium by faculty members in engineering colleges of Madhya Pradesh and Uttar Pradesh.
- To understand the perception and experience of users as well librarians on the use of electronic resources at engineering colleges of Madhya Pradesh and Uttar Pradesh.
- To draw librarians’ opinions towards the formation of the consortium for engineering colleges of Madhya Pradesh and Uttar Pradesh.
- To understand usage, statistics, reports and make the statistical presentation of comparison of usage statistics among Core Members, AICTE and Self-supported members.
- To analyse the usage pattern of e-resources in selected seventeen engineering colleges in Madhya Pradesh and Uttar Pradesh.
- To demonstrate the value for money invested on subscription of e-resource in terms of Usage of e-resources (in terms of number of downloads), Cost avoidance, Average cost of downloaded articles, Cost recovery and Cost savings.
- To evaluate the impact of INDEST-AICTE Consortium on research output in terms of number of publications in India.
To measure the impact of INDEST-AICTE Consortium on research output in terms of number of publications in Madhya Pradesh and Uttar Pradesh.

2.5.3 Formulation of Hypotheses

The following hypotheses are formulated in accordance with objectives of the study.

H$_1$ Majority of respondents have a positive attitude towards the formation of library consortium in Madhya Pradesh and Uttar Pradesh.

H$_2$ Library end-users in libraries of engineering colleges of Madhya Pradesh and Uttar Pradesh accept and use electronic resources.

H$_3$ There is no significant difference in number of downloads of e-resources between the colleges of Madhya Pradesh and Uttar Pradesh during the period 2008-2011.

H$_4$ There is no significant difference in number of downloads of e-resources between AICTE-supported colleges and Self-supported colleges during the period 2008-2011.

H$_5$ There is a significant impact of the use of INDEST-AICTE Consortium on research output in India.

H$_6$ There is a significant impact of INDEST-AICTE Consortium on research output in engineering colleges of Madhya Pradesh and Uttar Pradesh.

2.5.4 Identification of Items for Questionnaire

The questionnaire has been split into two categories for taking the responses from faculty members as well as librarians. The identification of items has been carried out separately for preparing the questionnaire.

The relevant literature was sorted for considering the items for the present work. Initially 52 and 98 items were identified for taking the responses from faculty members and librarians respectively. Because of the repetition, 6 and 8 items were removed respectively. Remaining 46 and 90 items were sent to the expert for their inputs.
2.5.5 Expert opinion

Experts opinion was elicited for refining the items in the preliminarily questionnaire. For that purpose they had been asked the following questions.

1. Are the items appropriate?
2. Is any modification required in any item?
3. Is there any need to delete any item or items?

On the basis of the responses received from the experts 4 and 8 items, respectively, were deleted. Finally 42 and 82 items have been considered for the study.

2.5.6 Pilot Testing

Bryman and Bell suggest that, a researcher must conduct the pilot testing to ensure that a questionnaire is sufficient, in order to minimize the errors of the respondents. McDaniel and Gates also suggest that in order to reduce errors, pilot testing should be conducted by a researcher. In this regard pilot test was conducted to improve the questionnaire and check the reliability of items.

The pilot study was conducted with 5 per cent of stratified random sample taken from the total population of the GLAITM (Now known GLA University) in the month of March 2012. A questionnaire was prepared and used in order to collect the data from faculty members. The data was analysed in the light of the results of the pilot survey. On the basis of pilot study the questionnaire was further improved and standardized.

2.5.7 Reliability Testing

As suggested by experts, 7 items were deleted and the value of Cronbach’s Alpha is found to be 0.654 shown in Table 2.2. The value ensures the reliability for the internal consistency of the questionnaire as Nunnally suggested that, the value of Cronbach’s Alpha should be more than 0.6. Reliability is that parameter by which it has been assured that measure yields the consistent result.
Table 2.2
Reliability Statistics: Use of Electronic Resources*

<table>
<thead>
<tr>
<th>S. No.</th>
<th>No. of Items</th>
<th>Cronbach’s Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>40</td>
<td>0.654</td>
</tr>
</tbody>
</table>

*Data Analysis by SPSS 20

2.5.8 Data Collection

After pilot testing the questionnaire has been given final shape and used as tool for data collection. There are various methods for the collection of data. Each method has its own strength and weakness.

The researcher has designed two types of questionnaires in order to gather the relevant data keeping in view the objectives of the study. The first type of questionnaire is for librarians (Appendix-A) to collect the information related to various aspects such as budget, services, collections and their opinions towards the use of e-resources through INDEST-AICTE Consortium. On the other hand, second questionnaire is for faculty members (Appendix-B) to assess the effectiveness of the consortium.

Initially, 525 questionnaires were randomly distributed among the faculty members of engineering colleges of Madhya Pradesh and Uttar Pradesh. From 525 questionnaires which were circulated to faculty members, 404 (76.95%) were returned as Babbie suggested that 50% response rate is sufficient for analysis and reporting. Out of these 404, only 293 (72.52%) have been considered for further analysis because the response of the rest was either incomplete or not proper.

Table 2.3
State-wise Respondents Description

<table>
<thead>
<tr>
<th>State (No. of Colleges)</th>
<th>Circulated</th>
<th>Actual Received</th>
</tr>
</thead>
<tbody>
<tr>
<td>Madhya Pradesh (6*)</td>
<td>225</td>
<td>177</td>
</tr>
<tr>
<td>Uttar Pradesh (11*)</td>
<td>300</td>
<td>227</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>525</strong></td>
<td><strong>404</strong></td>
</tr>
</tbody>
</table>

*Indicates number of colleges selected for the present work.
2.5.9 Data Collection Sources

The following sources have been used in order to gather the relevant data for the present research.

- College Library Websites
- Annual Reports and Brochures of the Institutes
- Questionnaires Filled by the Librarian and Users.
- INDEST-AICTE Consortium Annual Reports
- INDEST-AICTE Consortium Website
- Web of Science (WoS)
- SCIImago from http://www.scimagojr.com

2.5.10 Data Analysis

The collected data has been analyzed with the help of the Statistical Package for Social Science (SPSS) IBM Statistics version 20 and Microsoft Excel 2007. The following tools have been used for the further data analysis.

- Chi-square Test ($\chi^2$)
- Descriptive Statistics
- Mann-Whitney Test
- Cost Benefit Analysis

The details of the analysis and interpretation of data is presented in Chapter 6 and testing of hypothesis is presented in Chapter 7.

2.6 Originality and Significance of the Study

The present study attempts to assess and evaluate quantitative and qualitative use and impact of INDEST-AICTE Consortium in libraries of engineering colleges of Madhya Pradesh and Uttar Pradesh.

The present study will render assistance to other engineering colleges’ libraries to evaluate the impact of access to e-resources through the INDEST-AICTE Consortium and UGC-INFONET Digital Library Consortium in terms of usage of e-resources (in
terms of number of downloads), Cost Avoidance, Average Cost Per Download Cost Recovery and Cost Savings as well on research output in terms of number of publications.

There are a number of studies on the use of e-journals, but this is the first of its kind in India particularly in Madhya Pradesh and Uttar Pradesh.

It is expected that the methodology and findings will go a long way to help the librarians to better understanding the perception and experience of users in using electronic resources. This will lead to more effective and efficient use of electronic resources. Furthermore, they will be crucial in justifying the value for money invested on its subscription.

2.7 Citation Style

The citation and bibliographic references presented in the thesis follows American Psychological Association (APA) Style (6th edition) with slight variations.

2.8 References