Information and Communication Technology (ICT) is one of the key components of the modern society. Human society has witnessed many developments through the ages. But no other development has as much effect on the society as the emergence of the information age. Information is a basic commodity required for the success of any country. Good decisions depend upon quality of information available. Along with its positive impact, it also poses a greater challenge to the society due to its rapid convergence. The variety of information sources (print and electronic) and quantity of information available is overwhelming and threatening (Baro & Endouware, 2011). The proliferation of information in varying forms and formats simultaneously poses a plethora of problems for information hunters in locating and accessing information. Individuals are faced with diverse information choices in their studies, in their workplaces, and in their lives. Information is available through community resources, special interest organizations, manufacturers and service providers, media and libraries. Increasingly, information comes unfiltered (Rehman & Alfaresi, 2009). Out of this ‘deluge of information’ people need to be able to locate, retrieve, evaluate and use information to participate successfully and function competently in the contemporary society (Rajalakshmi, 2007). To cope up with the ever-changing world, there is a lifelong need for being informed and up-to-date. A competent user is one who is not only able to use a computer, but also has competencies of finding, evaluating and applying information.

**Information literacy**

The term ‘Information Literacy’ had its roots back in 1974 when Professor Paul Zurkowski, the President of Information Industry Association, coined the term ‘**Information Skills**’ to refer to people who are able to solve their information problems by using relevant information sources and applying relevant technology (Oviatt, 2010). Gradually, after replacing the terms user education, library orientation and bibliographic instruction, information literacy became a prime factor in attaining knowledge and developing new understanding. It is distinct from other terms of user skills; bibliographic instruction and library instruction, as it focuses on competencies like evaluating and applying information. Many definitions of information literacy are available in literature. Few of these are: Chartered Institute of Library and Information Professionals (UK) defines it as “knowing when and why you need information, where to find it, and how to evaluate, use and communicate it in an ethical manner” (CILIP, 2004).
Association of College & Research Libraries (ACRL) defines information literacy as “the set of skills needed to find, retrieve, analyze, and use information” (ACRL, 2000). The ACRL has created a set of standards that give in detail the skills needed to be information literate.

The definition given on the Western Michigan University Libraries website considers information literacy as the ability to identify, retrieve, evaluate, and use information that is appropriate to a need (Western Michigan University Libraries, 2004).

Prague declaration of 2003 defines information literacy as “the ability to identify, locate, evaluate, organize and effectively create, use and communicate information to address issues or problems at hand; it is a prerequisite for participating effectively in the information society, and is part of the basic human right of lifelong learning” (UNESCO, 2005).

ALA’s Presidential Committee on Information Literacy states “Information literate people are those who have learned how to learn. They are people prepared for lifelong learning because they can always find the information needed for any task or decision at hand” (ACRL, 1989).

Information literacy is a set of abilities requiring individuals to recognize when information is needed and have the ability to locate, evaluate and use the needed information more effectively. It forms the basis for lifelong learning. Amudhavalli identifies an information literate individual as one who is able to:

- Determine the extent of information needed;
- Access the needed information effectively and efficiently;
- Incorporate selected information into one’s knowledge base;
- Use information effectively to accomplish a specific purpose; and
- Understand the economic, legal, and social issues surrounding the use of information, and access and use information ethically and legally (Amudhavalli, 2008).

The research problem
The research problem involves a study of information literacy competency among postgraduate students and research scholars with a view to assess the existing scenario and to put forward recommendations for enhancing the level of information literacy competency among the students.
Need for the present study
The importance of information literacy has been well recognized to all learning environments and to all levels of education particularly to higher education. Information literacy is a necessary competency that is utilitarian in every aspect of a person’s life. For students, information literacy competency would facilitate independent and authentic learning rather than dependence on the teacher to provide answers to questions or problems that they are faced with. This creates greater responsibility toward their own learning, which in turn would help them to become self motivated learners and thinkers who are creative, analytical and effective (Mokhtar & Majid, 2008). So from students’ perspective, one finds that there is a need to conduct a study for analyzing the information literacy competency among the students of higher education in India. For this purpose, it is necessary to conduct a user survey of higher educational institutions. The analysis of information literacy competency of students will help towards creating an information literate society. It will also provide some insights to the researchers who like to do a comprehensive study on information literacy in the Indian context.

Objectives of the study
The objectives of the study are:

1. To determine students’ information literacy skills in the selected universities of Punjab and Chandigarh;
2. To examine the information seeking strategies of the students;
3. To assess the ability of the students in acquiring, organizing, evaluating and using the information effectively;
4. To provide university libraries with reliable data to support recommendations for the integration of information literacy content into the university curriculum;
5. To put forward recommendations which will help to create thinkers who can make optimum utilization of information in a broader information technology environment.

Hypotheses
The hypotheses of the study are:

1. That the students do not have the skills to select significant terms while executing a search strategy.
2. That the students do not have familiarity with various searching tools and techniques.
3. That the students do not have the skills to choose appropriate document type according to their need.
4. That the students do not have the skills to evaluate the information.
5. That the students understand ethical, legal and economic issues regarding the use of information.

**Scope of the study**
The scope of the study is restricted to the selected universities of Punjab and Chandigarh. Out of all the universities of Punjab & Chandigarh, Punjab Technical University, Jalandhar and Baba Farid University of Health Sciences, Faridkot were excluded due to the non-availability of any teaching department over there at the time when the researcher visited these universities. Rajiv Gandhi National University of Law, Patiala and Central University of Punjab, Bathinda were excluded from the scope of the study as these universities did not have well-established libraries. Besides, all the private universities have also been excluded from the scope of the study. Thus the scope of the study is limited to the following five universities:

1. Guru Nanak Dev University, Amritsar
2. Panjab University, Chandigarh
3. Punjabi University, Patiala
4. Punjab Agricultural University, Ludhiana
5. Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana

The study is concerned primarily with gathering detailed and factual information for ascertaining the information literacy competency level of the students of the above mentioned universities.

**Research methodology**
For the present study, survey method has been adopted. The problem was thoroughly probed and explored through the available literature. The researcher conducted an exhaustive study of the subject through print and web sources. The following research tools have been employed in the study to collect data within the scope of the study. The details of each are given as follows:

**(i) Questionnaire**
Two well structured questionnaires were designed to collect the data for the present study. The first questionnaire (Appendix-I) was designed to collect data from the students and research scholars in order to assess their information literacy skills. For this, Mittermeyer & Quirion’s questionnaire has been used with some modifications and additions. The second
questionnaire (Appendix-II) was for the librarians to elicit information regarding information literacy instruction provided by libraries. This questionnaire covers a variety of topics pertaining to information literacy instruction.

(ii) Interview
There were no formal interviews conducted for the study as most of the questions were asked in the questionnaire itself. However, informal interviews were conducted with the students and researchers whenever the need was felt.

(iii) Library records and reports: For collecting relevant data about the library, library records and reports were consulted.

(iv) Pilot survey
The questionnaires were pre-tested before using it with the survey population between August and September, 2010. Questionnaire-I was pre-tested at Guru Nanak Dev University taking 10 research scholars and 10 post-graduate students. Questionnaire-II was pre-tested at the same university taking the views of the librarian. As a result of the pilot survey, questionnaires were standardized by omitting some questions and refining others. While most of the questions were based on multiple-choice, the last one was open-ended asking the respondents to give their suggestions.

(v) Population and sample
Population consists of post-graduate students and full-time Ph.D. scholars of selected universities. Under graduate students have been excluded from the study because their information needs are usually limited to class notes and text books.

<table>
<thead>
<tr>
<th>Universities</th>
<th>Post-graduate students</th>
<th>Researchers</th>
<th>Total respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Universe</td>
<td>Sample</td>
<td>Universe</td>
</tr>
<tr>
<td>GNDU</td>
<td>2162</td>
<td>216</td>
<td>344</td>
</tr>
<tr>
<td>PUC</td>
<td>2316</td>
<td>232</td>
<td>525</td>
</tr>
<tr>
<td>PUP</td>
<td>2145</td>
<td>215</td>
<td>520</td>
</tr>
<tr>
<td>PAU</td>
<td>733</td>
<td>74</td>
<td>143</td>
</tr>
<tr>
<td>GADVASU</td>
<td>157</td>
<td>16</td>
<td>28</td>
</tr>
<tr>
<td>Total</td>
<td>7513</td>
<td>753</td>
<td>1560</td>
</tr>
</tbody>
</table>

Table 1.1: Population and sample

Proportional stratified random sampling method has been used to provide appropriate representation to both the categories of students. The population is divided into two stratas- post-graduate students and Ph. D. scholars. The data has been collected from 10% of the total population which is a satisfactory representative of the population.
(vi) Presentation of data

The data of the study is analyzed and presented in the form of tables. The data is broken up university-wise, faculty-wise, status-wise and gender-wise for the purpose of analysis. The distribution of the respondents is as under:

**University-wise distribution of respondents**

**Table 1.2: University-wise distribution of respondents**

<table>
<thead>
<tr>
<th>University</th>
<th>No. of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>GNDU</td>
<td>250 (27.5%)</td>
</tr>
<tr>
<td>PUC</td>
<td>284 (31.3%)</td>
</tr>
<tr>
<td>PUP</td>
<td>267 (29.4%)</td>
</tr>
<tr>
<td>PAU</td>
<td>88 (9.7%)</td>
</tr>
<tr>
<td>GADVASU</td>
<td>19 (2.1%)</td>
</tr>
<tr>
<td><strong>Total N</strong></td>
<td><strong>908 (100%)</strong></td>
</tr>
</tbody>
</table>

**Figure 1.1: University-wise distribution of respondents**

**Faculty-wise distribution of respondents**

**Table 1.3: Faculty-wise distribution of respondents**

<table>
<thead>
<tr>
<th>Faculty</th>
<th>No. of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Science &amp; Technology</td>
<td>449 (49.45%)</td>
</tr>
<tr>
<td>Social Sciences/Humanities</td>
<td>459 (50.55%)</td>
</tr>
<tr>
<td><strong>Total N</strong></td>
<td><strong>908 (100%)</strong></td>
</tr>
</tbody>
</table>
Status-wise distribution of respondents

Table 1.4: Status-wise distribution of respondents

<table>
<thead>
<tr>
<th>Status</th>
<th>No. of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post-Graduate Students</td>
<td>753 (82.93%)</td>
</tr>
<tr>
<td>Research Scholars</td>
<td>155 (17.07%)</td>
</tr>
<tr>
<td>Total N</td>
<td>908 (100%)</td>
</tr>
</tbody>
</table>
Gender-wise distribution of respondents

Table 1.5: Gender-wise distribution of respondents

<table>
<thead>
<tr>
<th>Gender</th>
<th>No. of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>458 (50.44%)</td>
</tr>
<tr>
<td>Female</td>
<td>450 (49.56%)</td>
</tr>
<tr>
<td>Total N</td>
<td>908 (100%)</td>
</tr>
</tbody>
</table>

Figure 1.4: Gender-wise distribution of respondents

(vii) Statistical techniques used

Statistical methods like Percentage and Chi-square have been used. The collected data has been analyzed with the help of Statistical Package for Social Sciences (SPSS).

Chi-square ($\chi^2$)

Chi-square ($\chi^2$) has been used to compute the differences in regard to non-metric data like university-wise, faculty-wise, status-wise and gender-wise distribution of data.

The formula for calculating Chi-square ($\chi^2$) is:

$$\chi^2 = \frac{\sum [(f_o - f_e)^2]}{f_e}$$

Here $f_o$ is frequency of occurrence of observed facts; $f_e$ is expected frequency of occurrence on independent hypothesis. The difference between the observed and the expected frequencies are squared and divided by the expected number in each case, and sum of these quotients is Chi-square ($\chi^2$). The more closely the observed result approximate to the
expected, the smaller the Chi-square ($\chi^2$) and the closer the agreement between the observed data and the hypothesis is being tested. Contra wise, the larger the Chi-square ($\chi^2$), the greater the probability of real difference of experimentally observed expected results.

The degrees of freedom (df) refer to the number of independent pieces of data used to calculate each statistical variable and are obtained from the number of rows and columns in the frequency distribution table.

The formula for calculating degrees of freedom (df) is:

$$
\text{df} = (r-1) (c-1)
$$

$\text{df} =$ degrees of freedom

$r =$ number of rows in which data is tabulated

$c =$ number of columns in which data is tabulated

The probability (p) indicates the level of statistical significance. The significance level is p equal to .05 or less than .05. The lesser the probability (p) the higher is the significance (Hoel, 1971). The results of the analysis are presented under the different headings. The chi-square ($\chi^2$) value, degrees of freedom (df) and probability (p) are shown below each table in chapter 5.

**Difficulties experienced in collection of data**

The investigator had to face a number of problems in getting the questionnaires filled in by the students. The survey work seemed to them an unnecessary work and they wanted the investigator to leave the questionnaire with them to be filled in by them at free time. Many of them expressed their inability to fill in the questionnaire within the stipulated time and repeated requests had to be made to get the questionnaires filled in. Many of them even questioned the need of filling up the questionnaire. Some other students showed their inability to fill in the questionnaire without certain questions being explained to them and a good deal of time had to be devoted for the purpose. Some even did not return the questionnaire to the investigator. The researchers also had shortage of time due to their teaching related responsibilities and often the investigator had to wait for them for hours to get the questionnaire filled in.

However, many of the respondents showed great cooperation for filling up the questionnaire. They wanted to convey their problems to the authorities related to the infrastructure and facilities provided to them and also wanted that appropriate steps should be taken for the betterment of services in their respective universities.
Presentation of the study

The study consists of seven chapters detailed as under:

Chapter 1 Introduction
Chapter 2 Review of Literature
Chapter 3 Information Literacy: Significance in Higher Education
Chapter 4 A Brief Profile of the Universities under Study
Chapter 5 Analysis and Interpretation of Data
Chapter 6 Discussion of the Results
Chapter 7 Findings, Recommendations and Conclusion

Chapter 1 describes in brief the research problem, objectives, hypotheses, scope of the study and research methodology.

Chapter 2 gives a review of the literature published on information literacy. The chapter is divided into two parts. Part one contains studies conducted abroad and part two those of conducted in India. An attempt has been made to include only those studies which are directly related to the present study.

Chapter 3 discusses the concept of information literacy and its significance in higher education. Various initiatives taken at international and national levels for the promotion of information literacy have also been discussed.

Chapter 4 gives a brief profile of the universities under study. Information literacy instruction provided by the libraries to its users has also been analyzed.

Chapter 5 analyses the results of the study on the basis of the data collected by the researcher.

Chapter 6 discusses the results of the study in the light of previous studies.

Chapter 7 gives a detailed description of the findings and conclusions of the study. It also includes suggestions for future research/study.

At the end of the thesis, bibliography and appendices have been given. Bibliography is given as per the rules provided by APA Style Manual, 6th ed. (American Psychological Association, 2010).

References


