

9-2011

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Sasikala, C. and Dhanraju, V., "Assessment of Information Literacy Skills among Science Students of Andhra University" (2011).
Library Philosophy and Practice (e-journal). 626.
<http://digitalcommons.unl.edu/libphilprac/626>

<http://unllib.unl.edu/LPP/>

Library Philosophy and Practice 2011

ISSN 1522-0222

Assessment of Information Literacy Skills among Science Students of Andhra University

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Introduction

Information literacy is a necessary skill that is utilitarian in every aspect of a person's life. For students, information literacy skills would lead to independent and student-centric learning, rather than dependence on the teacher to provide answers to questions or problems that they encounter. This in turn creates a greater responsibility towards their own learning, which would help him become dynamic learners and thinkers who are creative, analytical and efficient instead of mere regurgitators of facts.

But information literacy goes beyond coursework in its meaning and application. In a world where an infinite amount of information is available, individuals need to develop a greater understanding of information sources and need abilities to acquire, evaluate, use and communicate information. Become information literate will provide essential skills, needed to become a more proficient learner in the college, and subsequently, benefit students in both professional and personal endeavors. Information Literacy skills enable students to choose the best information for important decisions.

Further, the contemporary information world offers abundant information choices-print, electronic, image, spatial, sound, visual and numeric. The challenges posed to the users of information include too much of information in various format and all not of equal value. Explosion of information on Internet with billions of websites and pages and millions of print items both are complicating access and retrieval of information by the end users.

Information literate Individuals who are knowledgeable about finding, evaluating, analyzing, integrating, managing and conveying information to others efficiently

and affectively are respected more. These are students, workers, and citizens who are most successful at solving problems, providing solutions and producing new ideas and direction for the future.

The critical responsibility of education system in facilitating the empowering role of information has also been recognized by experts in the field (Boyer.1994). With in the college or University environment it is also important for students to be able to build up on the foundation of information literacy knowledge by successfully transferring this learning from course to course., understandings the critical and empowering role of information in a free and democratic society, and demonstrating ethical behavior and academic integrity as consumers, as well as producers, of information. Specially designed and implemented information literacy programmes by the academic libraries are instrumental in meeting the above said objectives of educational institutions. The present study focuses on this aspect of academic environment.

Review of Literature

Numbers of research papers have been published so far covering the basic concept of IL (Breivik, 1999; Owusu-Ansah, 2005; Lloyd 2005; Matoush 2006; Harris and Millet, 2006; Ramesha, 2008; Lloyd, 2008; O'Connor 2009), the range of IL standards and models (Donaldson 2004; Mackey and Ho 2005; Loo and Chung,2006; Keene and others, 2010), designing of IL programmes for different types of users (Fjällbrant 2000; Harley, 2001; Hartmann, 2001; Satish and Vishakha 2006; Stephenson and Schifter Caravello 2007; Sales 2008; Pinto 2010; Zuccala (2010), IL education, (Ercegovac, 1998; Elmborg, 2003; Krooden, 2004; Andretta, 2007; Limberg and others, 2008; Andretta 2008; Secker 2010), IL skills learning and instruction and technology (Ramalho, 2003; Berk and others, 2007; Godwin, 2009; Walsh, 2010) with in IL programmes.

The literature published on IL skills reveal some useful and interesting findings that assist in planning, designing and implementing programmes to develop as well as measure IL skills of specific user communities. A digital information literacy programmes at university of Texas at Austin serve as a case study for implementing information literacy skills into traditional library services and collaborative activities (Dupuis, 1997). An ongoing survey of information literacy competencies of graduate students of University of California- Berkeley (Davitt Maughan 2001) also examines the extent of which undergraduate students are information literate. The conclusions reveal that the students think they know more about accessing information and conducting library research than they are able to demonstrate when put to the test. These findings reiterate the earlier study findings that students continue to be confused by the elementary conventions and procedures for organizing and accessing information.

New methods of teaching information literacy skills, combining with problem solving techniques, to develop, promote and assess critical and analytical thinking of students further using information technology available in the contemporary environment have also been highlighted (Macklin, 2001). Efforts were also made to develop an instrument for measuring of IL skills of University students. This instrument will be administered to students to assess entry skills upon admission to the University and longitudinally to ascertain whether there is significant change in skills levels from admission to graduation (O'Connor, 2002). Another study by Feast (2003) evaluated the impact of an action plan that aimed to assist in integrating information skills into teaching and learning practices of eight first-year core business courses at University of South Australia. Content analysis and staff interviews were made to evaluate the success of the action plan. The findings show that the action plan had not delivered the expected outcomes. Brettle (2003) conducted a study to undertake a systematic review of literature on IL skills to determine the effectiveness of information skills training, to identify effective methods of training and to determine whether information skills training affects

patient care. The majority of studies took place in US medical schools. Wide variations were found in course content and training methods. Eight studies used objective methods to test skills, two compared training methods and two examined the effects on patient care. There was limited evidence to show that training improves skills, insufficient evidence to determine the most effective methods of training and limited evidence to show that training improves patient care. Further research was suggested in a number of areas. An project was conducted at the University of Melbourne during 2002 to evaluate effectiveness of different methods adopted for teaching information literacy skills to students in the Arts Faculty. The three programs that were evaluated used different modes of delivery. The paper discusses the rationale of the project, the methodology and the results of the evaluation (Fiona and Ellis, 2003). The need for the training the library and information professionals in the planning and implementation of IL programmes working in Indian University libraries was emphasized by Nyamboga (2004). Another study (Ramakrishna and Valmiki, 2004) conducted in KUVEMPU University to assess the computer literacy and information literacy of the post graduate students reveal that majority of the students lack awareness regarding the printed reference sources, highest percent of them do not possess the ability to identify the key concepts in the given information environment. About 44 percent of the respondents are unable to use the computers and many of them do not possess the knowledge about software, hardware and storage devices. Significant percent of them are not able to use the Internet. Majority opined that the computer literacy and information literacy programmes are "very important for them". These findings suggested the design and implementation of IL programmes for students at PG and UG level and the librarian need to play crucial role in imparting information literacy education to students. The importance of incorporating courses on information literacy skills to address the individual needs of students with disabilities for successfully meeting the academic standards for all the students has been demonstrated by Vreeburg Izzo and others (2003). A case study reported by Alfino and others (2008) explains the importance of integrating library skills into course goals to add coherence to the curriculum. In this project, staff were included in the instructional team, and information literacy skills that relate to critical thinking. Critical and philosophical arguments for constructivist based approaches to teaching critical thinking skills through online library instruction has been provided by Allen (2008). Kupier and others (2008) have conducted a study on the adequacy and specific characterizes of school students' use of web literacy skills and strategies. Morgan and Walton (2008) reported how librarians embraced new methods of working to general library and IT inductions at higher education level. In another project by Sounders and Coles (2008), the creation of a new research interface for academic users to improve their information literacy suggests that the diverse information literacy practices the users demonstrated could be enhanced if on – screen clarity and consistency of terminology were improved. An investigation by Gross and Don Lathan (2009) focused on student conceptions of and experiences with interacting with information. Using interview technique the students been assessed in terms of their information literacy skills. Findings reveal a general view of IL focused on product rather than process, a perception of achieving information skills on their own, a performance for people over their information sources and an emphasis on personal interest as key to successful information seeking. Contemporary research has also focused on digital literacy and its relationship to information literacy (Kenton and Blummer, 2010). They suggest the application of novel educational techniques in institutions of higher education using for imparting IL programmes. Librarians could develop tools to support students' interaction in course management system and virtual worlds, assist faculty in the creation of course curriculum as well as moderate online book discussions. Pinto and others (2010) propose a methodology known as creating concept maps what helps in diagnosing and improving information analysis, synthesis, organization and representation skills and competencies of students. They have tested its usefulness using action research methodology on a group of university students of library and information Science. This method provides information on the strengths and weakness of the students' skills, thus enabling

their training to be improved by means of specific actions.

Objectives of the Study

- To identify the competency level of information literacy among the students of Sciences in the Andhra University
- To make comparison of level of information literacy skills among the students about various resources & services
- To identify areas of strengths and weakness in information literacy skills among the students & their search strategies
- To know, how far they are succeeding in getting relevant information
- To find out the status of information literacy programmes offered by the institutional library

Scope of the Study

The study mainly focuses on IL skills of science students in identifying, locating, searching, accessing, retrieving and using information from both print and electronic sources of information. The sample of this study covers 141 students of the regular Science departments viz. Botany, Physics, Chemistry, Environmental Science of Andhra University, Visakhapatnam.

Methodology

A questionnaire was used to collect the data from the students of the departments of Botany, Physics, Chemistry, and Environmental Science of Andhra University. The questionnaire covers areas like demographic data, academic status, types of libraries approached, frequency of visits made to libraries, purpose of library visits, awareness about the use of printed reference sources, knowledge about arrangement of books in the library, library catalogue, frequently used sources, ways of finding information, opinions on the usefulness of library tools and user education programmes etc.

The survey posed thirty one (31) questions under seven sections, namely 'use of library resources and services', 'use of library & information services', 'familiarity with and use of information and communication technologies', 'searching, retrieving and evaluating web information', 'familiarity with copyright and fair use', 'information literacy instruction awareness'. Major findings of the survey are analyzed and summarized in the following sections.

1. Types of libraries visited

The study also has attempted to trace out the general information seeking behavior of students. To ascertain data related to various types of libraries generally used by the students relevant information has been gathered and presented in the following table.

Table 1. Types of Libraries visited

Type of libraries	No. of Students	Percent (%)
Public Libraries	35	24.82
School Libraries	16	11.35
College Libraries	46	32.62

University Libraries	109	77.30
None	6	4.25

The analysis of response, show that more than 77 percent of students are utilizing the services of university libraries followed by those visiting the college libraries (32%).

2. Frequency of visit made

The study has also attempted to trace out the general information seeking behavior of students. To ascertain data related to various types of libraries generally used by the students, relevant information has been gathered and presented in the following table.

Table 2. Frequency of visits

Frequency of visits	No. of Students (%)	Percent (%)
Never Visited	7	4.96
One Visit	4	2.84
Few Visits (2-10)	35	24.82
Several visits	37	26.24
Many visits(>20)	58	41.14
Total	141	100.00

It may be observed from the above table that highest percent of the student (41%) are visiting the library many times in a year followed by those students who visited the library several times (27%). Surprisingly among the students surveyed, there are also students who never visited the library during the year (nearly 5%)

3. Purpose of visiting the library

The value of the library facility to the users can be ascertained by identifying their purpose of visits to the library. Various options were given to describe various reason(s) for visiting the library.

Table 3. Purpose of visiting the Library

(More than one answer)

Purpose of visiting	No. of Students (N=141)	Percentage (%)
Recreational reading (news papers & magazines)	36	25.53
Borrowing/lending	29	20.57

Consulting Reference material(education& research)	44	30.21
Preparing for competitive exams	38	26.95
Photocopying relevant materials	10	7.09
Reading text books	79	56.03
Net surfing	31	21.99

The analysis of response from student reveal that the highest percent of them (56%) are visiting the library for reading the textbooks followed by those whose purpose is consulting reference material (30%). For preparing for competitive exams, about 27 percent of the students are found to be visiting the library. Visits were made by nearly 26 percent of students for recreational reading.

4. Use of college library services

In order to asses the extent of use of information sources and services in the library the students were asked about their use of this facility.

Table 4. Use of College Library Services

Response	Number of students	Percentage (%)
Yes	128	90.78
No	13	9.22
Total	141	100.00

Among the students surveyed majority (86%) stated that they are using the college library services for various purposes

5. Most frequently used sources of information

The present survey has also attempted to find out type of sources with which the students are mostly acquainted with and resources that are used with ease. The responses are analyzed and shown in the following table.

Table 5. Preferred Document Categories

(More than one answer)

Type of Documents	No .of Students	Percentage (%)
Books	133	94.33
Periodicals	45	31.91
Newspapers	60	42.55

Reference books	62	43.97
In-house databases	10	7.09
Library OPAC	17	11.34
Online databases	19	13.48
E-Journals	39	27.66
Internet	48	34.04
Any other (please specify)	3	2.13

Most of the students (94%) are found to be using books frequently followed by reference books (44%). and newspapers (nearly 43%). Among other sources frequently used, Internet was used by 34 percent, periodicals by 32 percent and e-journals by nearly 28 percent of the students

6. Knowledge about the parts of the book

In order to find out the level of understanding of the students about the importance of different sections of a book, they are asked about the purpose of the bibliography presented in the book. The findings in this regard are presented in the following table.

Table 6. Knowledge about parts of the Book

(More than one answer)

Response	No. of Students	Percentage (%)
The glossary	36	25.53
The index	60	42.55
The bibliography	20	14.18
The table of content	15	10.64
Any other (Please specify)	8	5.67
<i>I don't know</i>	16	11.34

The answers given by the students are indicating the level of understanding the students have about various parts of the book and their importance. Majority of them chose wrong answers. 42 percent stated that the index is a place where they can find other documents on the topic. About 26 percent pointed out 'the glossary' as a source of this type of information. No answer was given by 11 percent of the students. Only 14 percent gave the correct answer i.e. the bibliography. This shows the lack of awareness among the students about the basic structure of the

book, the source which they regularly use.

7. Knowledge about reference sources – Encyclopedia

The effective use of reference collection in a library depends on the users' level of awareness about the nature and importance of the content of these sources of information. To assess the students' level of understanding about encyclopedia as a source of basic and introductory information, they were asked to identify the best source for background information on a topic.

Table 7. Best source for back ground information

(More than one answer)

Type of Information source	No. of Students	Percentage (%)
Journal article	44	31.20
Encyclopedia	31	21.99
Book	38	26.95
Video	27	19.15
<i>I don't know</i>	18	12.76

The responses from the students reveal that majority of them are not having proper understanding of the importance of encyclopedia. Only 22 percent stated that encyclopedia is the best source for broad introduction on the topic. Highest percent of them (31%) pointed out journal articles as best source where as 27 percent expressed the opinion that books are the best source. About 13 percent of the students could not answer the question.

8. Awareness about shelf arrangement

The books in the library are usually awareness arranged following a specific method to facilitate helpful sequence for the sake of users. For successful location of library materials, the users must have sufficient understanding of the nature of arrangement these materials in the library. In order to find out the level of awareness of users in this regard, the students were asked to identify the system of shelving of books in the library. The responses are analyzed in the following table.

Table 8. Awareness about the method followed for shelving books

(More than one answer)

Methods of shelving books	No. of students	Percentage (%)
By Author	73	51.77
By ISBN number	16	11.34
By Title	31	21.99

By Call number	27	19.15
I don't know	17	12.06

The analyses of responses reveal some findings that are of serious concern. When it is about the user's awareness about the library and its procedures and functioning, majority of the students (52%) stated that the books on the shelves are arranged by author followed by those who felt that they are arranged by title (22%). These responses show the lack of awareness among students about the shelf arrangement in the library. The correct answer has been given by only 19 percent of the respondents. About 12 percent do not have any idea of about the shelf arrangement.

9. Use of call number

In order to know about the students' awareness about the importance and nature of use of the Call Number, they were asked to choose one of the optional among three alternative options

Table 9. Awareness about the use of Call Number

(More than one answer)

Purpose of call number as perceived by the students	No. of students	Percentage (%)
To locate a book in the library	56	57.73
To checkout a book	31	31.95
Browse the shelves for similar books	26	26.80

It is observed that highest percent of the students (58%) are well wave of the purpose of call number. They have identified the class number as a tool for locating the book in the library. From the library point of view, it is found to be useful for checking out of the book (32%).

10. Awareness about the importance of the library catalogue (1)

The library catalogue is a mechanism provided for identifying the type of collection available in the library. The users are expected to refer the catalogue to check the availability of the books of their choice in the library. The responses of students presented in the following table show the extent of their awareness in this regard.

Table10. Awareness about the purpose of Catalogue (1)

(More than one answer)

Type of source consulted to know the availability of a title	No. of students	Percentage (%)
Books in Print	20	14.18
Internet	13	9.21
Library catalogue	91	64.97

Bibliography	12	8.51
<i>I don't know</i>	13	9.21

It may be observed from the findings that highest, percent of students (65%) stated that they would search the library catalogue to identify books of their choice in the library collection. It shows that most of the students are aware of the purpose and importance of the catalogue. However the remaining students also need proper knowledge about the proper use of the library tools like catalogue.

11. Awareness about the library catalogue (2)

The study has also attempted to check the level of the students about the coverage and scope of the catalogue. Table 11 shows the responses of students on this aspect.

Table 11. Knowledge about the items usually covered in the catalogue

(More than one answer)

Response of the student	No. of students	Percentage (%)
Government publications	20	14.18
Videos	58	41.13
Books	29	20.56
Articles	28	19.85
<i>I don't know</i>	19	13.47

While answering the question on details of materials not found in the library catalogue, majority of the students gave wrong answer. Only 19 percent chose the right answer i.e. 'articles'. About 13 percent of the students could not give any answer to this question.

12. Search Capabilities

While attempting to ascertain the level of skills the students have to use the library catalogue for identifying and locating the required item, the students were asked question on the way they apply the search strategy. The students were asked to indicate their preferred search option when they were asked to locate items on the subject " M K Gandhi" in the library catalogue.

Table 12. Catalogue search capabilities

(More than one answer)

Search option followed	No. of students	Percentage (%)
By title	46	32.62

By publisher	15	10.63
By subject	26	18.43
By author	45	31.91
Any other (Please specify)	6	4.25
<i>I don't know</i>	17	12.05

The responses from users reveal their search capabilities in searching a library catalogue to find out all the required documents on a given subject. The findings show that majority of them are found to be not having adequate search capabilities to find out what they require from the catalogue. Majority of them gave wrong search option. While 33 percent said they search by title, 32 percent opted for search by author. There are students in the sample who do not know how to search the catalogue on a known subject. The correct answer i.e. by subject was given by only 18percent of the students. These findings are of great value to the library management in designing library orientation and user education programmes.

13. Means of finding required books from the library

As part of knowing about the library skills of students, they were asked to indicate different ways of finding required document. The responses were presented in Table 13.

Table 13. Method of finding a book

(More than one answer)

Method of finding a book	No. of Students	Percentage %
Searching the book shelves personally	36	25.53
Self-guided search using subject guides	61	43.26
With the assistance from library staff	43	30.49
With the assistance from co-students	20	14.18
Others (Specify)	6	4.25

Interesting findings are drawn based on the analysis of responses to this question. Self guided search using subject guides on the shelves has been found to be predominant among the students (43%). Dependency on library staff was noticed among 30 percent of the students. About 25 percent and 14 percent of the students searched the bookshelves personally and took the assistance of co-students respectively.

14. Library tools used for locating information

Numbers of tools are made available in libraries to locate information or documents

from the existing collections. To find out the awareness of students about these tools students were asked to indicate the tools they are using. Responses have been analyzed and presented in the following table.

Table 14 Tools used to locate information

(More than one answer)

Location tools used	No. of students	Percentage %
Library catalogue	91	64.53
Bibliographies	26	18.43
Union Catalogues	16	11.34
Abstracts and Indexes	22	15.60
OPAC (Online Public Access catalogue)	26	18.43
6. None	6	4.25
Others (specify)	3	2.12

For locating information, majority of the students are approaching the library catalogue (64%) However about 18 percent of them are also referring bibliographies and OPAC. Abstracts and indexes were referred by only 15 percent of the students.

15. Extent of usefulness of library tools & services

For the purpose of finding and using the books and information needed from the library, the users will be using different tools available in the library. Depending on the usefulness of these tools in finding required item, the students were asked to indicate the level of success they have enjoyed. Extent of help has been described using the responses are tabulated and presented in the following table.

Table 15 Extent of use of library tools and services

Extent of use	No. of students	Percentage %
Always	48	34.04
Many times	37	26.24
Some times	30	21.28
Occasionally	12	8.51
Rarely	12	8.51

Never	2	1.42
Total	141	100.00

Highest percent of the students (34%) stated that they could find and use the library books always using the library tools and services. About 26 percent of the students also stated that they could find books many times using various tools in the library. It is also observed that 8 percent of the students have succeeded occasionally and rarely in their search for the required book.

16. Opinion on the usefulness of library Orientation/ User Education programmes

User instruction and education programmes are offered in libraries in order to create awareness about various facilities and services of the library on one hand to develop library and information skills on the other hand. These skills enable the user to locate, and use the information or documents more efficiently and effectively. In this connection, the opinions of users are gathered regarding the importance of user education/ user instruction.

Table 16 Opinion on User orientation programmes

Response	No. of Students	Percentage %
Useful	111	78.72
Not useful	30	21.28
Total	141	100.00

The analysis of responses show that majority of the students (nearly 79%) believe that user education orientation programmes offered by the library would enable the users in searching and referring the needed books and information with ease.

.Familiarity with and use of ICTS

17 Use of Computers

In order to know the level of awareness the students have about the use of computers, they were asked to indicate about their pattern of use of computers. Following two tables will present the responses of students in this regard.

Table17. Use of Computers

Response	No. of students	Percentage %
Yes	133	94.33
No	8	5.67
Total	141	100.00

Regarding the use of computers, majority (94%) stated that they are familiar with the use of computers.

18. Familiarity with word processing software

While creating and using information in electronic format all the students need to apply some word processing software. For working in the contemporary electronic environment, especially with large amount of textual information all the contemporary users require the knowledge of at least one word processing software. The responses of students in this regard are shown in the table below.

Table 18 Familiarity with word processing software

Response	No. of Students	Percentage %
Very (advanced)	46	32.62
Some what (intermediate)	48	34.04
A little (beginner)	34	24.13
Never used it	13	9.21
Total	141	100.00

The findings on this aspect reveal the level of familiarity the student have with the most popular word processing software. Highest percent of them (34 %) stated that they are some what familiar with micro soft word about 33 percent of the students found to be very familiar with the use of the software among the students about 24 percent of only beginners. About 9 percent of the students have never used M.S word software.

19. Use of Internet

The present study also aimed at knowing about the extent of use of Internet by the students in addition to their use of computers. In order to know how many of them are using the Internet, pertinent data has been gathered and presented in the following table

Table 19 Use of Internet

Response	No of students	Percentage %
Yes	126	89.36
No	15	10.64
Total	141	100.00

The responses from the students on the use of Internet reveal that highest percent of them (nearly 89%) are found to be netizens. Next table shows the details regarding the frequency of using the Internet by students.

20. Frequency of use of Internet

The responses regarding the frequency of use of Internet were analysed and presented in the following table.

Table 20 Frequency of use of Internet

Frequency	No. of Students	Percentage %
Every day	35	24.82
Few times a week	62	43.97
Once a month	25	17.73
Every few months	11	7.80
Never	8	5.68
Total	141	100.00

Regarding the frequency of use of Internet it is found that majority of students are assessing the Internet few times a year (nearly44%) followed by those who are using it every day (approximately 25%). How ever about 5 percent of the students have stated that the never used the Internet facility.

21. Skills in the use of Internet

The following table the level skills the students have in accessing and retrieving information from Internet.

Table 21. Level of skills to use Internet

Response	No. of students (N=141)	Percentage %
Very	40	28.37
Somewhat	60	42.55
A little	38	26.95
Never done it	3	2.13
Total	141	100.00

It may be observed from the above table that majority of the students (42%) felt that they are some what skilled in the use of Internet they have medium level skills in accessing and retrieving information from Internet.

22 Purpose(s) of using information and communication technologies (ICT's)

Use of ICTs helps in many ways to improve the efficiency of operations on one hand and the quality of the result or the output on the other hand .In order to assess the purpose of using ICTs, the students were asked to indicate the purpose for which they are using these technologies.

Table 22. Purpose of using ICTs

(More than one answer)

Purpose	Number of Students	Percent %
Office Automation	17	12.05
Searching (Subject) databases	29	20.56
E-Mail	54	38.29
Chatting	17	12.05
Games/Entertainment	13	9.21
Work related information	31	21.98
Further studies	38	26.95
Job opportunities	42	29.78
Others (specify)	5	3.54

The responses from students reveal some interesting findings about the purpose of (S) using Internet by students. The highest percent of them (38%) are found to use the Internet for mailing purposes, followed by those who are browsing the net for the sake of jobs (30%). More than 26 percent of them are approaching the Internet for the sake of further studies. About 21 percent of them are availing the net facility for searching the online data bases and for information related to their work, and only 12 percent of the students stated they are using the net for chatting purposes.

23. Searching, retrieving and evaluating web information: knowledge about Internet

The present survey also aimed at finding the level of understanding and knowledge of students about searching, retrieving and evaluation of web information. Four statements were given about the Internet to assess the knowledge of the students; the responses are analyzed in the following.

Table 23. Knowledge about Internet.

(More than one answer)

Evaluating web skills	Response . of students And Number	Percentage %
The most reliable information on the web is from the websites of museums, recognized research organizations, scientific societies and government.	True 102	72.34

Most of the information available on the Internet has undergone a rigorous peer review process and so can be used as a reference for writing research papers.	False 103	73.04
Most of the information on the Internet has not been checked for accuracy of content, and so should not be used with out careful screening and evaluation.	True 99	70.21
One should only use information on the Web that is offered by a recognized authority on the subject or that can be verified using other sources.	True 116	82.26
<i>I don't know</i>	28	19.56

The responses show that majority of the students surveyed have good knowledge about the web resources. The first, third and fourth options were stated to be true by 72 percent, 70 percent, and 82 percent of the students respectively. In the case of second option majority (73 %) identified it as false information.

24. Use of electronic information available on web

In order to know whether the students use and apply the information they read and downloaded were asked from question regarding this.

Table 24. Use of information on WWW

Response	No. of Students	Percentage(%)
Yes	102	72.34
No	39	27.66
Total	141	100.00

The analysis of responses from students indicate that highest percent of them (72%) are using the information available on world wide webs for various purposes the purpose for which they are using information on web has been indicated in table.

25. Use of web tools and resources

Number of search and retrieval tools and resources are available on world wide web to facilitate easy access and retrieval of require information from web in order to access the extent of use of these tools by students data has been gather in this regard .

Table 25. Use of Web Tools & resources

(More than one answer)

Use of web tools	No. of students.	Percentage %
Search engine	43	30.49
Directories	20	14.18
Websites	81	57.44
Databases	29	20.56
None	22	15.60
Others (specify)	6	4.25

Among various resources and tools available on web, highest percent of students (57%) access different websites on web. About 30 percent are found to be using search engines. Another 20 percent stated that they access data bases on net. Web directories were used by only 14 percent of the students for locating information on World Wide Web. The responses show that many of the web search tools are not used by majority of the students because of ignorance.

26. Search techniques used

The information on Internet can be searched using various search strategies and techniques different search techniques are developed for improving the quality of retrieval process search techniques include keyword search use of Boolean operations truncation field search etc. users responses on the use of search techniques are analyzed and presented in the following table.

Table 26: Used various search techniques and strategies

(More than one answer)

Use search techniques and strategies	No. of students	Percentage
Simple key words	77	54.60
Boolean operators (AND, OR, NOT)	22	15.60
Truncation	25	17.73
Field search (title, URL etc)	29	20.61
Others (specify)	9	6.38

It may be observed from the above table that majority of the students(54%) are using simple keyword search for searching and retrieving information from a database. About 20 percent are applying field search techniques. Truncation techniques and Boolean operators were used by only 15% percent and 17 percent of the users respectively. This indicates that majority of the students are not aware

of the importance of various search mechanisms available for effective retrieval of information.

27. Familiarity with copy right

In order to know about the awareness of students on copy right data has been gathered from them about this aspect.

Table 27: Familiarity with Copyright

Response	No. of students	Percentage %
Yes	98	69.50
No	43	30.50
Total	141	100.00

It may be noticed from the above table that majority (69%) stated that they know about copy right and copy right infringement.

28 Knowledge about fair use and plagiarism

From the previous table it is observed that majority of the students are found be having knowledge about fair use and plagiarism. Further the students were asked to distinguish between fair use and plagiarism with the help 5 options given in the questionnaire the responses are analyzed in the table below.

Table 28. Knowledge about 'fair Use' and 'plagiarism

Response	YES No. of Students	Percentage(%)
Presenting the work of others as your own is plagiarism	35	24.82
Copying or rewording the content written by others and using it without citing the source is plagiarism	68	48.22
Reproducing the work for criticism and comment, given credit to the author is fair use	45	31.91
Using the content for teaching, scholarship and research, and citing the source is fair use	32	22.69
Using Audio/Video or pictures from the Net without giving credits to the Creator is plagiarism	22	15.60

The responses from the table above shows that 15 to 48 percent of the students are aware of the meaning of the words fair use and plagiarism.

29 Significance of IL for users

Information literacy programmes organized by the library offer many benefits to the users. Through these programmes skills required for accessing and retrieving

relevant information from the web and for evaluating and using it in an effective and ethical way may be imparted in the student an this aspect opinion of students were gathered.

Table 29. Significance of IL skills for users

Response	No. of students	Percentage
Yes	98	69.50
No	43	30.50
Total	141	100.00

Highest percent of student (69%) agreed that learning more about information literacy is important for them.

30. Preferred mod of importing IL Programmes

Different methods are being developed for importing information literacy skills among the library users. Different options were given in the questionnaire and the students were asked to indicate preferred mode of IL instruction.

Table 30: Preferred Mode of imparting IL programmes

(more than one answer)

ii Preferred mode of imparting ILP	No. of students	Percent %
Printed Information Literacy instructions	48	34.04
Integrated in to course curriculum	71	50.35
Online IL instructional modules via College Websites	39	27.65
Online IL instructional modules via Library Website	15	10.63

Among various modes of IL instruction, majority of the student (50%) suggested for IL instruction that has been integrated in to course curriculum. In addition to this, 34 percent also preferred to have printed information literacy instruction. About 28percent preferred to have online IL instruction via college website.

31. Ares to be covered in IL programs

Students were also asked to suggest different areas and topics where they think they need guidance and training through IL programs. Different areas suggested by the students are analysed and presented in the following table.

Table 31: Suggested areas where IL programmes are required

(More than one answer)

Suggested areas on ILP are required	No. of students	Percentage %
Use of printed sources (Library Classification		

& Catalogues)	77	54.60
Use of electronic sources	55	39.00
Computers	83	58.86
Specific Application sources	30	21.27
Online Databases	46	32.62
Internet	84	59.57
E-mail	45	31.91
OPAC	29	20.56
Institutional Repositories	33	23.40
In- house Databases	30	21.27
CD-ROM Databases	30	21.27
Digital Library	22	15.60
Any other (Please specify)	13	9.21

Among the areas identified by students where they need training, Internet occupied the 1st place with 60percent of the students opting for training on it. It is followed by computers (59%), use of library printed sources (nearly 55%), use of electronic sources (39%), use of on-line data bases (33%) and use of e-mail (32%).

Discussion and Recommendations

The present study aimed at ascertaining the facts related to the nature and extent of use the University library and its resources by the students of basic sciences viz. Zoology, Botany Physics, Chemistry and Environmental Science. The main intension is to assess level of the library and information skills of students in the optimal use of library facilities, services and materials.

Among various libraries approached by the Science students, University library stood in the first place. Majority of these students found to be using the library facility many times in a year, but not frequently. The findings also revealed that there are students who had never used the library during their period of study. The main purpose behind visiting the library is 'reading text books'. For consulting reference materials also significant percent of students are availing the library facility. About more than one fourth of the students are visiting the library for preparing for competitive examination and for recreational reading. These findings indicate the nature of use of various information sources and facilities available in the library. The University library contains a rich collection of periodical literature and reference materials in the form of dictionaries, encyclopedias, world books, almanacs, year books and indexing and abstracting periodicals. These sources are not being consulted by many of the science students. Especially, periodical

literature has not been given any importance among various sources preferred by them.

In order to assess the level of awareness the students have about various library procedures, methods, tools, the knowledge of the students has been tested through a set of questions on library catalogue, shelf arrangement, call number, parts of the book and search skills.

The responses from students on the importance of different parts of the book, reveals that majority of them do not have proper understanding of the basic structure of the book even though most of them said that they frequently use it for required information. When it comes to the knowledge about reference sources, many of them could not give right answer to the question on the 'best source for broad introduction on the topic'. This shows their ignorance in terms of scope and purpose of various reference materials available to them in the library.

The analysis of responses on the topic of shelf arrangement followed in the University library clearly indicates the degree of awareness of students in this regard is very low. Less than 20 percent of the students are aware of the classified arrangement followed by the library. Some of them even do not have any idea about the type of shelf arrangement adopted in the library.

The level of awareness about the library catalogue among majority of the students is found to be satisfactory. To find out the availability of required book in the library collection, majority of them said they consult the library catalogue. However, surprisingly when answering the question on types of materials not covered in the library catalogue, majority could not give right answer. The reason for this may be that most of them are not frequently consulting periodical literature. Further, they are not aware of the proper meaning of the term 'articles'. These findings indicate that majority of the students are not having proper knowledge about the details of library materials covered in the library catalogue on one hand and are not having the clear understanding of periodicals and their content and the way they are indexed in the library. With regard to the search capabilities required by the students while searching the library catalogue, it is observed that majority of them do not have the skills to identify their actual information need and to search the catalogue under the appropriate access point. Less than 20 percent of them could give right answer to the question.

Once the library user ascertains the availability of a particular known title in the library collection, next step he/she follows is locating the identified book from the shelves of the library. Different guiding tools are provided by the library to assist users to locate the books on the shelves. It is observed that majority of the students are following subject labels with class numbers provided on the book shelves to locate the required book. However significant percent of them are also depending on library staff for locating the required book on the shelf.

When it comes to identifying and locating information, majority of the students are depending on subject catalogue. Less than twenty percent are referring subject bibliographies.

The opinions of students on the usefulness of various library tools and services in finding required books from the collection. Highest percent of them stated that they could always found the books they wanted with the help of library tools and services. However this percent of students is less than half.

About the importance and usefulness of user orientation and education programme, more than three fourth of the students felt that they are really useful in enabling them to use the library collection and services with ease to the maximum extent.

ICT Skills and Knowledge

In the contemporary information society, the Information Communication Technology skills are required for exploiting the available electronic sources of information for various purposes. Since majority of the libraries are hybrid libraries; the library user is expected of having basic skills and knowledge about computers and Internet. The present study reveals that majority of the students surveyed are familiar with the use of computers. With regard to the practical knowledge about general application software like Microsoft Word, only 33 percent said that they are very familiar with the use of it. Highest percent (34%) said that they are somewhat familiar with this software. More than one fourth of them are only beginners in its use. Some of the students do not have any idea about MS Word. These findings show that among students, more than half of the do not have skills and knowledge in the use of popular word processing software.

With regard to the use of Internet, highest percent of them are found to be familiar with the use of Internet. However, only 21 percent of them are using it every day. Regarding the skills at the students have at using the Internet, most of them felt that they are somewhat skilled.

The present study has also gathered details related to the purpose(s) with which the students are using Internet. Among various reasons, highest percent of students stated that they are using Internet for mailing purpose followed by those who are using it for information on jobs. More than one fourth of them are pursuing their further studies through Internet.

In order to find out the students knowledge and level of understanding about the Internet, they were asked to identify the statements about Internet that are true. The responses from students reveal that more than 70 percent of them are aware of the characteristic features of information available on World Wide Web. They could distinguish the source of reliable information from unreliable sources on net. They knew that the information drawn from online sources has to be carefully screened and evaluated before using it. Further more than 70 percent of students are using the information available on World Wide Web for various purposes.

Among various Web tools and resources, institutional websites stood in the first place in terms of their use by students. Search engines are used by 31 percent of the students. Databases were accessed only by 20 percent of the extent of use of web directories is low compared to other tools and resources. When it comes to the use of search techniques, most of them are using simple keyword search. Other techniques are used by less than 20 percent of the students. It shows that majority of them do not have proper knowledge about the benefits of using Boolean operators and truncation techniques while searching the online sources.

Awareness about the copyright is also important on the part of students to use the required information without violating copyright regulations. It is really evident from the study that majority of the students. Majority of the students are found to be having awareness about copyright and its implications. It is also observed that most of them know the difference between faire use and plagiarism.

Citations play important role in writing research papers. Knowledge about different standard citation styles is a must for a researcher for completing a research report. The present study reveals that more than half of the students surveyed do not have knowledge about the citation styles mentioned in the questionnaire.

The importance of imparting information literacy programmes to develop information literacy skills among the students can not be ignored in the contemporary electronic environment. This has been recognized and accepted by majority of the students. Among various modes of imparting the IL instruction, majority suggested for integration of IL instruction in regular courses. Significant percent of them also felt that IL skills can be promoted using the printed material on and through the college website. Different areas and topics were suggested by the students, where they need some guidance, training and assistance, including training on the use of the Internet, followed by computer training, use of print and

electronic sources, and databases.

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