CHAPTER – VII

DESIGN AND DEVELOPMENT OF INFORMATION LITERACY

PROGRAMMES AND PRACTICES

7.0 Introduction

Information literacy is a group of competencies essential to academic success, and beyond that, to performance in today's knowledge-driven society. Elements of information literacy - researching, analysing, interpreting, disseminating - have always been integral to the development of the mental discipline that characterises a successful graduate. Steadily the cluster of information literacy skills has been repositioning as a generic graduate outcome. As result the skills base has been broadening. This movement and growth has occurred in response to the exponential increase in both the number of information channels that can be accessed, and the amount of information that flows through them. All the members of the information society - particularly graduates - need to be able to navigate these channels. That this information flood has been caused by mass communication through technology, in particular internet, is undisputed. However, the most significant, versatile, transportable and accessible tool for the control of information is information literacy. Information literacy is not system-dependent; it can 'migrate' from platform to platform; it is backwards-compatible. It works equally well with online databases, paper-based archives, mass media and oral communication (Macpherson, 2004).

Information literacy consists of the following four parts: first, information awareness, which means people’s reaction to information; second, thoughts of information, which means the procedure to process information; third, knowledge on information, which means basic information theories, ways in which to collect information and analyse it, the anticipation and utilization of information; and fourth, the
skills of information retrieval, which means a basic knowledge of information retrieval and the use of all kinds of information retrieval tools. These four elements depend and inter depend on each other and together constitute the general structure of information literacy (Li, 2006).

7.1 Existing Models, Standards and Guidelines

There are many Models, Standards and guidelines being applicable around the globe and some tested and well-accepted are listed below:

7.1.1 Information Literacy Models

Some well-known Models are;

a. SCONUL (Society of College, National and University Libraries)

It is a seven pillar model used to promote excellence in library services in higher education and national libraries across the United Kingdom and Ireland 45 (Society of College, National and University Libraries). SCONUL identifies seven headline skills -

(i) ability to recognize a need for information;
(ii) ability to distinguish ways in which the information 'gap' may be addressed;
(iii) ability to construct strategies for locating information;
(iv) ability to locate and access information;
(v) ability to compare and evaluate information obtained from different sources;
(vi) ability to organize, apply and communicate information to others in ways appropriate to the situation;
(vii) the ability to synthesize and build upon existing information, contributing to the creation of new knowledge (http://www.sconul.ac.uk).
b. Big6: Skills Information Problem-Solving Approach to Information Skills Instruction

It is an information and technology literacy model and curriculum, implemented in thousands of schools – through higher education. Some people call the Big6 an information problem-solving strategy because with the Big6, students are able to handle any problem, assignment, decision or task. This bases the learning around the six steps:

(i) task definition;
(ii) information seeking strategies;
(iii) location and access;
(iv) use of information;
(v) synthesis;
(vi) evaluation.

Further, in order to solve an information problem of answering a research question, you follow a research process or research steps. It lists some steps to be followed such as:
(i) the first step is preparing for research. At this step your brainstorm ideas and possible sources of information; narrow your topic to make it manageable; and plan how you are going to do your research;

(ii) the second step is accessing resources. Here, you decide what sources of information will be best; find them; and locate the information in them that might be helpful in answering your information question;

(iii) the third step is processing information. This is the step where you look closely at the information from your sources; decide what is important; and take notes. Then you organize your information; make sense of it; and develop your own ideas about it

(iv) the fourth step for successfully solving your information problem is to transfer your learning. This is the step where you take your ideas and the information that helped you come to them and plan, create and present to other people, your findings and solutions (http://www.big6.com).

The information search process consists of distinct stages that are marked by changes in the individual’s cognition and experience. Kuhlthau’s (1993) model is linear and consists of six stages; initiation, selection, exploration, collection, presentation and assessment. Information needs change as the individual’s understanding of their information problem becomes clearer. The information search is dynamic because it involves learning during the search. The model has eight stages, which are similar to Kuhlthau and Eisenberg & Berkowitz. The relationship between the stages is dependent on the individual’s specific problem and situation. The librarians can help the individual to define their information problem and goals during reference interviews. Kuhlthau’s zone of intervention describes the point at which it is appropriate for librarians to intervene in the individual’s information search process (http://archive.ifla.org/).
7.1.2 Information Literacy Standards & Guidelines

Information literacy standards & guidelines provide a framework for assessing the information literate individual. It also extends opportunity to articulate its information literacy competencies to develop for students at all levels. The competencies present outline of the process by which faculty, librarians and others pinpoint specific indicators that identify a student as information literate.

The users also will find the competencies useful, because they provide students with a framework for gaining control over how they interact with information in their environment. It will help to sensitize them to the need to develop a metacognitive approach to learning, making them conscious of the explicit actions required for gathering, analyzing, and using information. Furthermore, some disciplines may place greater emphasis on the mastery of competencies at certain points in the process, and therefore certain competencies would receive greater weight than others in any rubric for measurement. Many of the competencies are likely to be performed recursively, in that the reflective and evaluative aspects included within each standard will require the student to return to an earlier point in the process, revise the information-seeking approach, and repeat the same steps. To determine how information literacy standards will help to improve the learning and enhance the institution’s effectiveness. Also to facilitate acceptance of the concept, faculty and staff development is also crucial (ACRL, 2000).

There are some well-known standards:

a. Association of College and Research Libraries (ACRL)

In 2000, ACRL the a division of the American Library Association (ALA), released "Information Literacy Competency Standards for Higher Education", describing five standards and numerous performance indicators considered best practices for the
implementation and assessment of post secondary information literacy programs. The five standards are: The information literate student -

1. Standard One: determines the nature and extent of the information needed.
2. Standard Two: accesses needed information effectively and efficiently.
3. Standard Three: evaluates information and its sources critically and incorporates selected information into his or her knowledge base and value system.
4. Standard Four: individually or as a member of a group, uses information effectively to accomplish a specific purpose.
5. Standard Five: understands many of the economic, legal, and social issues surrounding the use of information and accesses and uses information ethically and legally.

The ACRL standards are very popular and widely accepted and tested around the world. It includes the expected outcomes under each performance indicator, which are developed with the purpose of providing guidance in the development, assessment methods, instruments and strategies for measuring students’ learning outcomes. These standards can be used to assess the IL skills of teachers, librarians etc. The standards focus upon the needs of students in higher education at all levels. The standards also list a range of outcomes for assessing student progress toward information literacy (ACRL, 2000).

b. IFLA Information Literacy Guidelines

The International Guidelines on Information Literacy have been compiled on behalf of the Information Literacy Section of IFLA, with the aim of providing a pragmatic framework to those professionals who need or are interested in starting information literacy programmes from scratch. The guidelines will help the libraries to
guide their work to meet current information needs of those who are engaged in educational programs, that is schools and higher educational institutes.

The information literacy standards, to become effective learners, include three basic components: access, evaluation and use of information. Lau (2004) notes that these core goals are found in most of the standards created by individual educators and library associations such as AASL, ACRL, SCONUL and the Australian and New Zealand Institute for Information Literacy. The IFLA information literacy standards are based on these international experiences and contributions. The IFLA standards are grouped under the three basic information literacy components.

**ACCESS:**
- Definition and articulation of the information need
- Location of information

**EVALUATION:**
- Assessment of information
- Organisation of information

**USE:**
- Use of information
- Communication and ethical use of information (http://archive.ifla.org)

c. **Australian Information Literacy Standards**

The Australian Information Literacy Standards are based on the United States standards. The United States standards were reviewed at a workshop by the University of South Australia for the Council of Australian University Librarians (CAUL). Keeping in view the Australian research, theory elaboration and practice, the United States standards were modified to suit the Australian higher education setup where the standards were first intended to apply. The major difference between the Australian and United States
standards is that the Australian standards are more inclusive than the United States version and talks throughout about the “Information Literate Person” rather than the “Information Literate Student”. The scope of the Australian standard is obviously wider covering not only to the students but also to the faculty member and non-academic setting (AARL, 2001).

d. Information Literacy Standards in Science, Engineering and Technology

In January of 2002 JoAnne DeVries, the Chair of the Science and Technology Section, charged the STS Task Force on Information Literacy for Science and Technology with developing standards, performance indicators and outcomes for library instruction in science and technology. The STS Council approved the resulting product in June of 2004 at the American Library Association Annual Conference in Orlando, Florida. Based on the ACRL Information Literacy Competency Standards for Higher Education, five standards and twenty-five performance indicators were developed. Each performance indicator is accompanied by one or more outcomes for assessing the progress toward information literacy of students of science and engineering or technology at all levels of higher education (ACRL/STS, 2006).

7.2 Need for Design and Development of Information Literacy Programme for Engineering College Libraries

Information and technology affects every person in every possible setting - education, public service, and business. Education is fundamentally information based. That is, every aspect of learning and teaching requires the gathering, processing, and communication of information. In the past in education, there was a reliance on one primary information resource i.e., textbook. But this is rapidly changing due to in large part of the explosion in information technology and networked information. The users are increasingly turning to the electronic sources and web based services for information.
Today libraries are functioning in a hybrid environment. Most of the engineering college libraries are providing traditional as well as ICT based services. Indeed, the libraries have been conducting instruction programmes with varying nomenclature to describe their resources, various services, marking and parking patterns, library use ethics etc. However, the changing library environment requires the libraries to play a more important role through information literacy programmes. The abundance of information available through the Internet in public domain in the form of subject gateways, e-books, e-journals, subject and subject concept based web pages, etc., as well as the information available through different subscription based databases offered by various hosts and aggregators, is bound to play a very important role in teaching, learning and research, particularly in engineering education.

It is found from the present study that many engineering college libraries are conducting information literacy programmes for the students and the faculty. These programmes are highly appreciated by the users. But these programmes are basically orientation programmes with limited delivery methods and generalized content and are only effective to create awareness of the various facets of resources and library services. These need to be upgraded with the changing technological advancements, which could equip the users. Hence, it becomes very essential to the librarians that the structured IL programmes, which should cover various contents on all the aspects of library services and various resources in all forms & format, using latest technology, such type(s) of IL programmes are to be designed, developed and delivered in order to make sure that everyone receives comprehensive training. Though various methods are available but using a combination of several methods is advised since different methods are more suitable for different aspects of the IL programmes.
A majority of the colleges offer undergraduate courses and majority of the libraries are providing IL programmes once in a year at the beginning of the semester that to less than an hour. Hence, the engineering college libraries should conduct IL programmes frequently. So that that students get chance to learn information skills and become information literates.

The librarians are striving to find out the ways and means to organize and make accessible this huge information available in different sources including the Internet. For a maximum utilization of these resources in teaching learning and research, the Information literacy programmes are the need of the hour. It is essential to educate the users as to how to determine his/her information need; what are the different information sources, their coverage and features; how to find out relevant and precise information from various electronic information sources; what are the web searching techniques; how to evaluate and establish the authenticity and reliability of information retrieved from public domain; what are the ethics and legalities in using electronic information sources; how to make proper bibliographic citations etc. Information Literacy is essential to make the end users competent enough for retrieving precise and relevant information as per their need. (Singh & Mujumdar, 2009).

The information literacy programmes are important components of every library and information services. Whether offering direct instruction to users, providing skills-based help, delivering one-to-one (physical or virtual) assistance, or even providing meaningful signage in a physical setting, every information and library situation requires helping users to succeed through improving their level of information skills or understandings. The purpose of any academic library or information centre is to fulfill the information needs of its users. IL, by ensuring that users are effective in seeking and using information, is an important part of fulfilling this purpose.
The Information literacy competency is highly important for the students in science and engineering / technology disciplines who must access a wide variety of information sources and formats that carry the body of knowledge in their fields. These disciplines are rapidly changing and it is vital to the practicing scientist and engineer that they know how to keep up with new developments and new sources of experimental/research data. The science, engineering, and technology disciplines pose unique challenges in identifying, evaluating, acquiring and using information. The peer reviewed articles are generally published in more costly journals and, therefore, not always available. Gray literature requires knowledge of the agency/organization publishing the information. Much of science, engineering and technology is now interdisciplinary and, therefore, requires knowledge of information resources in more than one discipline (ACRL, 2002).

To provide the right information to the right user at the right place and cost to achieve this many institutions of higher education worldwide have implemented different IL standards and guidelines. These documents not only list the information-related competencies that students ought to possess and exhibit, but also make recommendations as to how these competencies can be integrated within the curricula. But it is found that India lacks such IL standards/guidelines/ models for all level of education. The users need to be encouraged to seek for information independently and have to acquire the skills to determine its relevance and usefulness for the various academic purposes. They also have either no experience or very little experience of searching information from various information sources, especially from internet and databases. This situation demands an effective information literacy programme which will tend to orient the users to a new world of information. Through this study the researcher has made an attempt to propose a model Information literacy programmes for the engineering college libraries.
7.3 Proposed Information Literacy Programmes

The students need to be nurtured with various skills under the general education programme which could instill in them a confidence of leading a qualitative life with a pursuit to gain effective knowledge exploiting the ICT facilities. The most important objective of ILP is to train and make the actual user into potential and literate user.

The students of the engineering college libraries need to be encouraged by providing and supporting with quality learning experience to seek for information independently and have the skills to determine its relevance and usefulness for the various academic purposes. The aim of introducing IL programme is to provide skills to the students and activities which enable users to think rationally and creatively, to solve problems, manage, search, evaluate information and to communicate his/her ideas effectively. The engineering libraries should aim to edify the students and faculty about the skills of identifying, locating, evaluating and determining the authenticity of information. Hence, the researcher has proposed a model Information literacy programmes for the engineering college libraries.

7.3.1 Objectives of Information Literacy Programme

The main objectives of IL programme of engineering college libraries are as follows- to

✓ provide the users an orientation about the organization of the library, how information is organized, and disseminated, its various finding aids services, facilities, infrastructure etc.,;
✓ make the users to understand their information requirement for their academic tasks like for completing projects/assignments;
make the users to access needed information, from wide range of sources available for locating information in various formats such as print, electronic form, etc., with effectively and efficiently by using appropriate tools;

acquaint the users with the use of various search techniques, strategies and skills to identify, situate, retrieve, and use relevant needed information from the best suitable communication medium and format effectively to achieve their goals and objectives, such as completion of projects, assignments etc.;

make the users competent in recognizing the needed information and critically evaluate information obtained from various sources for validity, authenticity, accuracy, objectivity, appropriateness and use information for critical thinking, problem solving and intelligent decision making;

create awareness among the users about the use of the information legally & ethically. And also demonstrate a basic understanding of plagiarism, copyright, fair use of copyrighted material IPR etc;

make the users able to cite bibliographic references in the project reports or dissertation; and various citation style of formats;

7.3.2 Contents of the Information Literacy Programmes (ILP)

<table>
<thead>
<tr>
<th>Content</th>
<th>Brief description of the Contents</th>
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| 1. General introduction about library | • Brief introduction about functions of the library, information resources, and its services (library orientation).  
                                        | • Library tour / video about the Library (physical layout, ICT infrastructure facilities and other facilities available)  
                                        | • The Library policy, rules and regulations.                                                   |
| 2. Introduction of I L P         | • Define information literacy & its importance. Objectives and outcomes ILP                     |
| 3. Pre-Test / assignment         | • To determine/ understand users skills and knowledge level                                      |
| 4. Define & articulates the need for information. |                                                                                           |
| a) Understand the topic, information need & | • Explains the need and importance of defining a                                              |
### Information Seeking

| b) Understanding of sources & retrieval tools | • Find out the users knowledge about previously used sources/tools that would help familiarize them with the topic.  
• Introduce the users to the range of sources and tools and importance of referring sources/tools to find background information about the topic.  
• Using the skills of defining information needs- Users determine information already known relevant to their questions & establishes the information needed/gap |
| c) Identification of terms /words on topic | • Introduce to the user the idea of terms /word identification and its importance. Demonstrate to users how to use various tools to find relevant term related to topic.  
• Also explain to the users how to organising ideas related their topic and demonstrate mind mapping.  
• Guide the user to identify suitable terms/words and for to their topics using various tools and draw mind maps based on the chosen topic. |

### Locate and Access Needed Information Effectively and Efficiently

| a) Knowledge of categories of resources | • Understand from the users their knowledge of categories of information resources.  
• Introduce users to categories of information resources. |
| b) About category of information resources | Overview of category of Information resources, products and services available;  
• Print Resources: Introduction to availability of various types of library resources – text books, reference sources & books on different subjects, standards, other resources etc., and Periodicals subscription,  
• Electronic Resources: Introduce about the various A-V Materials viz CD-ROMS, VCDs, DVDs etc., subscription to various electronic resources viz., e-journals, e-books, Online databases, Online & Web lectures (NPTEL) etc. |
| c) Understanding of structure of information resources | • Explain the users about structure of information resources & search tools and how it facilitates the information seeking process.  
• Locations of various information resources availability, classification schemes followed, and stack arrangement.  
• Explain about formulation of search strategies and their use in information retrieval system. |
| d) Location and access tools |  
| e) Knowledge of search strategies |  
| f) Basic search strategies | • Use of Library Catalogue - Hands-on practices on |
| and search tools to locate information | searching OPAC/WEBOPAC.  
- Demonstrate how to access information using various methods such as search queries & different Search techniques (Boolean, truncation, phrase searching etc.) |
|---|---|
| g) **Use of e- resources (online database & e-Journals, e-books)** | The users should be educated in order to derive maximum benefit from databases.  
Overview of subject-based electronic information resources  
- Online database such as ACM, IEL Digital Library etc., and its function and coverage.  
- Searching techniques using database search interfaces.  
- Hands-on practices on how to search electronic database effectively.  
- Institutional Repositories / Digital Library  
- Open archives initiatives: OAI in Science & Engineering (Directory of Open Archive Journals)  
- How to access electronic resources via network (LAN/Wi-Fi). |
| h) **Web resources** |  
- Overview of Web resources, OAI, RSS, Wikies meta search engines  
- Searching techniques using specific search engines (Google, Google Scholar and others).  
- Criteria for assessing web information content and its sources. |
| i) **Information searching & capture** |  
- Understand search tools and construct search strategies  
- Retrieve and review the results  
- Capture and organize resources retrieved |

### 6. Critical evaluation of retrieved information resources

| a) **Understand evaluation criteria of information content & its source** |  
- Locating and accessing information from the various resources  
- Discuss and demonstrate to students, various techniques of capturing and synthesize information.  
- Explain critical evaluation of the procured information and its sources, and as a result, decide whether or not to modify the initial query and/or seek additional sources and whether to develop a new research process.  
- Demonstrate to the users various criteria of information such as reliability, validity, accuracy, authority, timeless, point of view or bias etc., for assessing information content and its sources. |
| b) **Applying synthesis and evaluation skills** |  
- Understands the economic, ethical, legal, and social issues surrounding the use of information and its technologies and either as an individual or as a member of a group, uses information effectively,
ethically, and legally to accomplish a specific purpose.

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<tr>
<th>8. Communicating and using information</th>
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<tbody>
<tr>
<td>a) Presentation techniques &amp; ways of using</td>
<td>Demonstrate different ways of presenting/communicating information by defining the purpose of information, format, product &amp; presentation techniques.</td>
</tr>
<tr>
<td>b) Research &amp; Documentation Techniques information</td>
<td>Bibliographic description, understanding various systems of bibliographic citations, different ways &amp; importance of citing, Writing &amp; documenting research work, copyright issues etc.</td>
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The proposed Information literacy programmes are developed by taking the help of Information Literacy Standards for Science and Engineering/Technology developed by the ALA/ACRL/STS Task Force on Information Literacy for Science and Technology.

The information literacy competency and the purpose of information literacy competency standards are fully described in the ACRL document, which states that information literacy "is common to all disciplines, to all learning environments, and to all levels of education." Information literacy in science, engineering, and technology disciplines is defined as a set of abilities to identify the need for information, procure the information, evaluate the information and subsequently revise the strategy for obtaining the information, to use the information and to use it in an ethical and legal manner, and to engage in lifelong learning.

7.3.3 Delivery Method(s) of the Information Literacy Programme

Following method(s) /mode(s) may be selected for the teaching/delivering programmes;

- Lecture / Demonstration
- Library tour and orientation
- Printed Training Manual (Library guides/handbooks e.g. Know your Library)
- Audio-video lectures
- Individual Instructions (Face to Face)
● Small group instruction in the library
● Search Exercise
● Hands on instruction in lab.
● CD-ROM Instruction
● Online Tutorial
● Web based instruction
● Scheduled workshop/expert Lectures
● Special promotional activities (e.g. Book exhibition)

### 7.3.4 Assessment of Information Literacy Programme

It is important to assess/ evaluate the effectiveness of the I L programmes delivered and also evaluate the effectiveness of the programmes in increasing the knowledge of the users. The effectiveness of programmes on the users, knowledge can be measured comparing the pre and *post-test or survey*. This will help in understanding the knowledge & skill level of users and future improvement. The assessment of the effectiveness of the programmes delivered may be measured using evaluation form, or feedback form, on aspects such as attendance, time allocation for the sessions, delivery methods, content of the programme, infrastructure facility / Physical environment etc.

### 7.3.5 Duration of the Information Literacy Programmes

- Two hours per semester for overall programmes
- One hour per semester or as and when required - for special subject related I L programme / on special activities such as subject related Databases, Digital Library / Institutional repositories, research documentation etc.

### 7.3.6 Responsible for delivering of Information Literacy Programmes

- The librarian along with the team of library staff
- Collaboration with faculty, IT experts (system admin), Communication experts,

### 7.3.6 Outcome of the Information Literacy Programme

1. Users able to recognize potential information resources and able to use the library and its resources independently.
2. Increases the use of library and proper utilization of resources, especially electronic databases which are related to their discipline.
3. To be able to distinguish between different resources and services.
4. To be able to use the information technology effectively for retrieval and application of information.
5. Familiar with various methods and techniques used for accessing both print and electronic information.
6. Acquaintance with various techniques used for searching information available in electronic forms.
7. Increase use of electronic resources available in various forms and formats.
8. Understand the legal and ethical value of information.
9. To be able to document the research work done (e.g. dissertation, project work/report, thesis etc.).

7.4 Summing Up

It is axiomatic that information is not useful unless it is retrieved and used. A student’s ability to locate, select, analyse and articulate the value of information is fundamental to his/her academic success. Information literacy is a crucial competency to enable students, as future information literate professionals, to function as lifelong learners in the information society.

The ongoing explosion in networked information services is likely to continue at a rapidly accelerating pace. Navigating the ocean of print and the electronic information is becoming more difficult. This development emphasizes a teaching and instructional role. Increasingly, the librarian is being viewed as a central element in developing student and faculty skills for coping with the rising tide of information. The information literacy instructional facilities, almost an afterthought in library design, will be central to the mission of the library of the future.

The study indicates that there is a lack of understanding of the importance of IL for the student learning outcome. Hence, it is suggested to make the programmes
compulsory. Then the new students would treat it seriously and therefore, be prepared to face the ever-growing range of information sources positively and with minimal assistance from the library professionals. The libraries must make special effort to raise the learning motivation of students. This can be done by constantly evaluating the programs by taking feedbacks from the students as well as faculty to understand what appeals to them.
References


