Virtual Learning Environment and Information Literacy: Concept, Contents and Cases

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Abstract
The paper explores the concept of information literacy (IL) in the context of emerging virtual learning environment. It describes various models of IL and course contents through some cases. Information literacy instruction is alive and functional on campuses today. IL needs to be treated differently from the usual programmes, e.g. library orientation bibliographic instructions, provided earlier by libraries to acquaint users with information resources. IL should aim to help users to reach their information but also to help them to organize, synthesize, evaluate and, use ethically.

Keywords: Virtual Learning Environment. Information Literacy. Strategies. Course Contents. Methods and Approaches.

Introduction
Learning is natural to living beings, it helps them to grow, develop and survive. Human beings learn the most that makes them the highest evolved form of life. Learning begins at dawn and continues till the dusk of life. Putting differently, we say it’s a lifelong process. No one can claim that learning is no more required at a particular stage of life. Only its modes and means change. Informal learning takes place all the time when we interact with our environment. Formal learning starts at home, continues in the school, college, university, workplace, etc. Differences in the infrastructure and other facilities at the place of learning create gaps and divides among individuals. Those having better access to information and proximity to an informed teacher could learn better than others. Information and Communication Technologies help us overcome this gap and the resultant disparity.

Virtual Learning Environment
The concept of Virtual Learning (VL), described by various terms such as e-learning, computer assisted learning, technology enhanced learning or online learning is a flexible mode of learning with learner at the centre. It provides resources to the learner in digital format, 24x7, enabling him/her to study at his/her convenience. Virtual Learning (VL) takes place owing to developments in ICT. VL takes learning outside the four walls of the classroom aiming at universal learning. It is live, two-way, interactive mode supported by multimedia lessons providing links to the knowledge repositories across the globe. It removes all barriers in knowledge transfer and dissemination. VL enables a society to move towards knowledge society by making knowledge freely available to all.

The emergence of virtual library environment must be observed as a corollary to initiatives to unify the IT structures and to transform the learning process through innovative technology. Economic, social, and cultural pressures are forcing schools and universities to rediscover and reinvent themselves. Akin to business process re-engineering activities of the last decade that repositioned corporate sector, education organizations are now viewing themselves in an altogether new light. New types of students and changing student expectations are driving the integration of core campus functions and deployment of student services on the Web. Homogenous and highly integrated approaches are failing and falling away as educators realize the need to link learning and administrative resources in a more effective way to become a ‘knowledge enterprise,’ the 21st Century version of the traditional campus. “During the past decade steep declines in the cost of commodity components, combined with the availability of high bandwidth networks, have made sophisticated IT applications for education affordable”. (Wright, 2002). A mix of sophisticated digital and Internet-based services and rapidly expanding global digital content have made possible a Virtual Learning Environment (VLE) that delivers the capability to enhance the classroom experience or conduct learning apart from a physical campus.
We have examples of online teaching and learning taking place in India. Indira Gandhi National Open University (IGNOU, 2009) is offering six online study programmes namely Masters in Library and Information Science (MLIS), Post Graduate Certificate in Cyber Law (PGCCL), Post Graduate Certificate in Agricultural Policy (PGCAP), Post Graduate Diploma in Food Safety and Quality Management (PGDFSQM), Post Graduate Diploma in Acupuncture (PGDACP) and Appreciation Programme in Sustainability Science (APSS). To support the programmes and otherwise provide facility for democratic learning the University provides educational material in various other disciplines through the online repository named e-Gyan Kosh. To quote from the IGNOU Profile 2009 After its launch on June 9 2008, the site has already received 3, 00,000 hits, with an average of 1,000 visits per day from all over the world. There are 26,000 active users of the repository. (www.ignou.ac.in)

This is an ample proof of wide use of the facility and its utility in the society. There are other initiatives taken in this direction by the Indian Institute of Technology (IIT), Consortium for Education Commission of the University Grants Commission (UGC), National Council of Educational Research and Training (NCERT). They have developed interactive e-contents and some are also providing e-courses in the VLE. The University of Delhi, one of India’s premier institutions of higher learning has recently established Institute of Life Long Learning with a mandate to develop e-contents accessible online to the students of University. (www.du.ac.in)

Defining Information Literacy (IL)
Bruce (2002), an authority on IL observes that IL grew with the developments in IT stressing its importance. In his words:

The idea of information literacy, emerging with the advent of information technologies in the early 1970s, has taken shape and strengthened to become recognized as the critical literacy for the twenty-first century living. Today, information literacy is inextricably associated with information practices and critical thinking in the information and communication environment.

The Presidential Committee on Information Literacy of ALA (1989) has defined IL as the set of skills for recognizing an information need and locating, evaluating and using the needed information effectively. The definition comprises four facets, i.e. recognizing the need for information, locating, evaluating, and using the needed information effectively. The first facet speaks for the need to realize that the work we are engaged with can be done better using information. It can be learning a concept, presenting a talk, lecturing on a topic, taking a decision etc. Next, one should know the sources of information and be able to locate information from the sources. Finally, one should be able to evaluate the source of information as well as the information per se and also use the needed information effectively. It is worthwhile to look into these aspects individually.

Though VL has removed the barriers of access to knowledge yet the learners have to be enlightened and empowered to make use of these facilities. They have to be motivated and independent learners. Learning – which used to be teacher centric – is now learner centric. It is in this context that there is a lot of mention of terms like Information Literacy (IL) and Digital Information Literacy (DIL). IL empowers an individual to access, find and use information to seek knowledge and thus become an independent learner.

IL and its Components
A library has two types of clientele – the users, and the potential users. The aim of a librarian is to understand the information needs of the user and provide him/her information accordingly. Librarians have been trained to understand the information needs of the users for which due emphasis is laid on the Reference Interview. Potential users need the services of the library but do not use it. Library puts in efforts by advertising its services, conducting orientation services and also providing outreach services to attract such potential users. So people may not realize that information would help them to achieve their goals easily and effectively. Thus, making people realize that they need information for various purposes is the first step towards making them information literate.

Locating Information
It is a well known fact that today information is available in plenty on any subject. It is available in different forms and formats and always on the rise. Web is the most used source of information today. One needs to know about these sources as well as be adept at finding information from these. For that one should know how that information has been organized and also formulate a search strategy and use various search techniques. Information on a topic is available in different sources in different measures for different purposes. An encyclopedia provides background information whereas a journal article provides information related to research on that topic. Similarly, certain databases specialize for information on some subjects which an IL person should know.

Evaluating Information
An Information Literate (IL) person should evaluate information for its authenticity, reliability, validity, accuracy, timeliness before using it. It is easier to evaluate information in a print source due to its stability and existence for long. It is difficult to evaluate web resources but there are measures for that also and any IL person should be able to do that. An IL person should also be able to evaluate not only the source of
information and information per se but also the validity of information for the purpose at hand.

Using Information
Information is the basic ingredient for more information and subsequently leading to the creation of knowledge. It has to be understood, assimilated, synthesized, and communicated for others to know and lead to more information and knowledge which is a never ending spiral resulting in creation of knowledge. An IL person should be able to use information effectively implies that he/she is able to correlate it to his/her repertoire of knowledge and add to it further to apply for the task at hand. IL also assumes that anyone using this information uses it ethically. An IL person acknowledges the source of information wherever used by him/her.

Viewing in a different way, Hannelore Rader (1990) characterizes an IL person as the one who:
- survives and is successful in an IT environment
- leads productive, healthy and satisfying lives in a democratic society
- deals effectively with the rapidly changing environment
- ensures a better future for the next generation
- finds appropriate information for professional and personal problem solving, and
- has writing and computer proficiencies

She opines that IL people will be able to fetch for themselves information for their needs from the library or form outside anywhere on the globe and thus survive in the information society.

Strategizing IL
Information literacy programmes (ILP) strive towards changing focus from teaching particular information based resources to develop and enhance a set of critical thinking skills. This change is reflected within the Information Literacy Competency Standards for Higher Education, developed by the Association of College and Research Libraries (ACRL) (American Library Association, 2000). “ILI in an academic setting includes a variety of instructional approaches, such as course-related library instruction sessions, course-integrated projects, online tutorials, and stand-alone courses Those running formal ILI programs consider curricular objectives, invoking combinations of instructional solutions over a period of time” (Spitzer, Eisenberg, & Lowe, 1998)

IL Standards
Association of College and Research Libraries (ACRL, 2000) has formulated standards of IL for higher education that help in developing an IL curriculum for an educational institution. The standards also provide performance indicators (PI) and outcomes for each standard that have been presented briefly below.

The IL aspirant
- Determines the nature and extent of information needed
- Accesses the needed information effectively and efficiently
- Evaluates information and its sources critically and incorporates selected information into his or her knowledge base and value system
- Individually or as a member of a group, uses information effectively to accomplish a specific purpose
- Understands many of the economic, legal, and social issues surrounding the use of information and accesses and uses the information ethically and legally

Performance Indicators
The IL aspirant
- Considers the costs and benefits of acquiring the needed information
- Reevaluates the nature and extent of information need
- Selects the most appropriate IR system for accessing the needed information
- Constructs and implements effectively designed search strategies
- Retrieves information online or in person using a variety of methods
- Refines the search strategy if necessary
- Extracts, records and manages the information and its sources
- The IL student evaluates information and its sources critically and incorporates selected information into his or her knowledge base and value system

Evaluation
The IL aspirant
- Summarises the main ideas to be extracted from the information gathered
- Articulates and applies initial criteria for evaluating both the information and its sources
- Synthesises main ideas to construct new concepts
- Compares new knowledge with prior knowledge to determine the value added, contradictions or other unique characteristics of the information
- Determines whether the new knowledge has an impact on the individual's value system and takes steps to reconcile differences
- Validates understanding and interpretation of the information through discourse with individuals
- Determines whether the initial query should be revised
- Individually or as a member of a group, uses information effectively to accomplish a specific purpose
- Applies new and prior information to the planning and creation of a new product or performance
- Revises the development process for the product or performance
- Communicates the product or performance effectively to others

**Ethical Use**

Information is the basic ingredient for more information and subsequently leading to the creation of knowledge. It has to be understood, assimilated, synthesized, and communicated for others to know and lead to more information and knowledge which is a never ending spiral resulting in creation of knowledge. An IL person should be able to use information effectively implies that he/she is able to correlate it to his/her repertoire of knowledge and add to it further to apply for the task at hand. IL also assumes that anyone using this information uses it ethically. An IL person acknowledges the source of information wherever used by him/her.

**IL: Course, Contents and Modules**

IL skills are being imparted by libraries in different modes, e.g. standalone programmes, course related IL programmes and course integrated programmes. These are provided as tutorials by organizations available on the web, offline on CD or even as hand outs in the printed mode. Standalone programmes aim at developing generic IL skills. These provide exercises in searching databases and other sources. Course related programmes dwell on IL skills in different subjects and areas. Course integrated programmes are for a particular subject/area and also planned in such a way that it forms an integrated part of the curriculum. Such a programme has credits assigned to it which may not be the case in the other two types of IL programmes. Smith (2003) has proposed an IL Curriculum for the Sciences as an integrated IL programme. It is spread over four parts, viz.:

i) **Undergraduate**: Beginning/ General – includes introduction to the different types of resources (primary, secondary and tertiary), core resources in a subject, basic research process in the sciences, basic searching skills and applying the same to a database, evaluating a resource and citing a work

ii) **Undergraduate**: Advanced – includes role of information the process of research, in-depth introduction to the types of resources, core information resources, print and electronic, introduction and application of more sophisticated search strategies, searching online resources, scientific information on the web, portals, searching and evaluation, process of publishing scientific information and peer review, evaluating a scientific paper, evaluating information and critical thinking

iii) **Graduate Students** – includes scientific research process and the sources of information at each stage, information tools of practicing scientists, scientific publication process in depth from the perspective of the scientist/ producer, key sources and databases in the discipline, information seeking process with a focus on in depth research for theses and research proposals, information management including use of bibliographic management software, peer review process, evaluating scientific information and journal articles, citation indexing, Journal Citation Report (JCR), Internet for scientific communication and information resources and key issues in scholarly publication including copyright, electronic publishing.

iv) **Professional Scientists** – Post Doctoral and Independent Researcher- includes updates on new features of known resources and introduction to new resources, keeping up with new literature by TOC services, browsing, alerts/ SDI, identifying core journals in a discipline, citation counting and JCR, limitations of citation counting and impact factor, searching the Institute for Scientific Information (ISI) databases, advanced searching the key discipline – specific resources, bibliographic and data sources, search on the web including portals, directories, organization and publisher information, locating grant news and announcements, e-journals publishing and accessing, managing a personal resource collection, information skills and instruction in undergraduate and graduate courses, training and mentoring.

**IL Contents : Some Select Cases**

Purdue University Library, Illinois (http://www.lib.purdue.edu/rguides/instructional-services/infolitcurriculum) provides an IL curriculum with six goals, i.e. to enable the user to:

- understand the role, value and power of information in modern society;
- understand and be able to communicate his/her specific need(s) for information;
- understand that information varies in its organization, content and format;
- retrieve information form a variety of systems and in various formats;
evaluate information sources; and
understand how to organize information effectively.

According to Hunt and Birks, “To achieve information literacy goals successfully, instructors must first break down the skills and concepts into their basic components. These components should then be presented sequentially and in increasing levels of complexity allowing time for practice and repetition.” Accordingly, the Information Literacy course at the Katharine Gibbs School has been developed for an eleven-week long term with the following objectives and measures:

Week One
Objectives
- define information and the modern dilemma of information overload;
- recognize the different ways of information organization;
- discuss characteristics and formats of information;
- develop a searchable topic.

Week Two
Objectives
- focuses on refining research topics;
- discuss facets of a topic and relationships between subject fields and disciplines;
- create subject terms or keywords.

Week Three
Objectives
- discuss information access, including access tools and access points;
- use the library catalog;
- develop search strategies;
- introduce search skills such as Boolean logic, truncation, wild cards, etc.;
- formulate a research question.

Week Four
Objectives
- continue to instruct on information search tools with emphasis on library databases;
- discuss scholarly communication (peer-reviewed, scientific) and types of periodicals;
- cover the topic of research statement.

Week Five
Objectives
- instruction on information evaluation for relevance, currency, reliability, coverage/completeness, and accuracy.

Week Six
Midterm Objective
- test students on what has been learnt thus far.

Week Seven
Objectives
- continue to work on information search tools;
- focus on Web searching;
- cover topic of writing research paper outline.

Week Eight and Week Nine
Objective
- cite sources in standard style;
- instruct on promoting awareness of the ethical, legal and socio-political issues surrounding information and technology.

Course Evaluation
According to Katharine Gibbs School “Instructors shall observe students’ progress in learning information literacy concepts and skills through interactions and consultation with students throughout the course”.

Web based tutorials is yet another method being adopted. One of these is IL Tutorial for the Five Colleges of Ohio, a consortium funded by the Andrew W. Mellon Foundation. Its members are College of Wooster, Denison University, Kenyon College, Oberlin College and Ohio Wesleyan University. It is an interactive tutorial available on all the five campuses providing the learner the know how about different stages in the flow and use of information.

According to (Vander Meer, 2000); “Online ILI tutorials are helpful in many ways to students, faculty and librarians”. However, “they are also criticized for being tedious and text-heavy presented as stand-alone lessons, disconnected from courses or assignments (Dewald, 1999; Donaldson, 2000); lacking sufficient interactivity to create adequate active learning experiences (Dewald et al, 2000); and communicating an academic research process that is not relevant to students’ expectations” (Veldof & Beavers, 2001).

IL has been recognized as a rich area not yet explored much in India. However, there are sporadic and individual efforts regarding its teaching and researching. Nyamboga (2004) describes the efforts of Indian University Libraries in IL. He gives brief details of the automated resources of five universities, i.e. Bangalore University, Cochin University of Science and Technology, Gulbarga University, University of Hyderabad, Kuvempu University and Mangalore University. It is expected for a library to be at least automated to provide IL skills training today. A scan
of the different university websites in India would bring to light the efforts of their libraries in providing IL services. Delhi University Library System leads by providing information to facilitate the use of e-resources. It has been organizing IL sessions for its researchers every academic year wherein they are taught the techniques to use e-resources and also to cite references while reporting research. IL programmes are also organized for the post graduate departments and colleges for the faculty and students. Other universities provide information on their websites about e-resources and also the ways to use them.

The 15th Annual Conference of Indian Library Association had IL as its theme. IL has been a facet in most of the conferences and workshops in the country. There have also been seminars and workshops conducted by other association like Indian Association of Special Libraries and Information Centres, Society for the Advancement of Library and Information Science.

The IL Course: Methods and Approaches
Different kind of approaches have been adopted depending on the specific needs of the institution. According to Bawden, Devon, & Sinclair (2000) "an increase in remote access to information and a demand for more rapid, anytime-anyplace sharing of information," many academic libraries have started to offer ILLI via the Internet. The most common online instructional tool is the Web-based guide (e.g., pathfinders, webliographies) (Vander Meer, 2000). Donaldson (2000), observes that another trend that has gained popularity is the information literacy tutorial, which is an interactive, Web-based program designed to introduce students to general information literacy concepts and information resources.

Specific cases receiving recent attention within higher education include: (www.libraryinstruction.com/higher-ed.html)

- The University of Texas at Austin's Texas Information Literacy Tutorial (TILT) integrates Web-based ILLI into first-year college courses and enhances students' conceptual grasp of information resource selection, database searching and Internet source evaluation.
- The California State University Information Competence Project presents ILLI tutorials in a visually interesting environment and addresses mass media literacy. Interactive learning exercises and diverse audiovisual components (e.g., sound, quick-time movies, animations) are incorporated into it. (Clay, Harlan, & Swanson, 2001).
- The University of Washington Information Literacy Learning (UWILL) initiative is designed to teach information literacy skills in context with course objectives. Customized tutorials assist students in completing course assignments while developing information competencies (University of Washington, 2001).

Some of the institutions offer formal information literacy courses. These courses range from for-credit to non-credit, from required to elective, and from distance to face-to-face modules. They can involve integration with a core curriculum, specific discipline or course, or general information skills (Donnelly, 1998). Such courses have gained popularity because they offer opportunities for in-depth instruction and reinforcement of research skills through course activities (Frantz, 2002).

According to Jacobson and Mark (2000), instruction becomes most effective when offered in context with content-based courses and assignments. Academic libraries have incorporated meaningful learning experiences into information literacy courses in a variety of ways:

- University of Oregon's LIB 101 course uses a "scenario-based approach" by building assignments around research situations familiar to undergraduate students (Frantz, 2002).
- Instructors of "Information Literacy" at the State University of New York College of Environmental Science and Forestry offer research assignments allowing students to address topics from their other courses (Elkins et al, 2001).
- Montana State University College of Technology's Information Literacy course requires students to investigate a personal problem using information gathered throughout the course. (Kaip, 2001).
- University of Maryland University College offers a required online course, "Information Literacy and Research Methods," in which students research a particular topic and participate in electronic discussions on timely research issues (Read, 2002).

IL Across the Curriculum
According to Orr, Appleton, & Wallin, (2001) "Other schools go beyond the stand-alone information literacy course by integrating ILLI into the overall curriculum. An across-the-curriculum approach is favored because it ties information literacy into all students' experiences". Hinchliffe & Meckstroth, (2001); Jacobson & Mark, (2000) observe that specific approaches include integration of information literacy objectives into general education and first-year programs and development of campus-wide information competency initiatives. In these situations, librarians, faculty and others work together to provide ILLI at the point of need.

IL: Developing Best Practices
According to Breivik (1998) higher education institutions vary widely in their mission and student profile, IL programs should be designed to meet
specific needs rather than a prescribed set of criteria. “Implementation of a particular approach or program depends on many institutional and situational factors such as audience, purpose, budget, staffing, facilities, and time”

ACRL’s Best Practices Initiative (American Library Association, 2001) offers one of the most complete sets of best practice characteristics. These characteristics emphasize the importance of integrating ILI throughout a student’s entire academic career and advise using multiple methods of assessment for evaluating ILI programs. ACRL provides a detailed outline of the recommended components for excellent IL planning, collaborative ILI pedagogy, outreach to academic departments and other efforts necessary for creating successful ILI outcomes. In addition, the literature offers some specific characteristics of successful ILI programs:

- use of student-centered, active, and collaborative learning methods (Wilson, 2001)
- adherence to instructional design principles during planning (Hinchliffe & Woodard, 2001)
- relevance to particular course goals and, ultimately, the overall curriculum (Breivik, 1998; Dewald, 1999)
- formation of partnerships between library, faculty, and other campus departments (Stoffle, 1998)
- support of faculty learning and development (Wilson, 2001)
- scalability for large numbers of students (Stoffle, 1998)

**Institutionalizing IL**

There is a need for formalizing and institutionalising the ILP programmes by linking them with various academic courses and awarding some credits. The institutionalization of IL will help in its gaining popularity in the society and research in the specific area will also take a wider base. United States takes the credit for maximum contribution in this area. Australia, New Zealand, Britain, Canada are not far behind. UNESCO has helped the cause by promoting conferences and workshops in different countries. Training of Trainers in IL Workshop held at Punjabi University Patiala is one such example in India. The US has a National Forum for Information Literacy which was established in 1989. It also has an Institute for Information literacy that was set up in 1998. Information literacy stands on the agenda of the U.S. National Education Technology Plan 2000. It has been adopted at the state level in higher education at Oregon, Wisconsin and Colorado. These include the SUNY Information Literacy Initiative, California State University System Information Competence Project, Wisconsin and the University of Massachusetts. (Snively,2002; Wilson, 2001). IL standards have been implemented at the level of colleges too, e.g. Kings College and the Earlham College. IL has been adopted at various levels in Australia also. The Council of Australian University Librarians (CAUL) has developed IL standards that have been implemented by universities. The IL programme of Central Queensland University run in the distance mode is an internationally known programme. Universities of Ballarat and Wollongong have integrated IL into their curriculum (Bruce and Candy, 2000). Another development furthering the implementation of IL has been the setting up of a joint Australian and New Zealand Institute of for Information Literacy (ANZIL). Research in IL has been given a fillip by holding of a conference on IL every two years by University of South Australia and Australian Library and Information Association (ALIA). Similar developments have been reported from countries like France, Germany, Sweden, Spain etc. Considerable interest and application of IL is seen in the numerous websites and web tutorials hosted by university libraries and other higher learning institutions.

**Conclusion**

IL is an important programme provided by libraries today in view of the increasing volume of information available today and also its importance in the information/knowledge societies. We experience the Information Fatigue Syndrome due the overload of information. Data smog is another term used often these days to signify the information seeker state of uncertainty about the information he/she has at hand for the particular problem at hand. LIS professionals have the requisite skills to come to the rescue of the information seeker at this juncture.

Grassian & Kaplowitz, (2001) argue that “Information literacy instruction is alive and doing well on campuses today. However, there is much work to be done before integrated ILI across the curriculum becomes a standard practice. Some challenges include motivating students to learn information literacy skills; assessing student mastery of concepts and skills; training librarians to serve as instructors and instructional designers advocating the value of information literacy”. Bawden, (2001) asserts “that in an environment of competing literacies and preparing students for business settings that demand a more specialized level of information influence”.

According to Marcum, (2002) “There is a clear need for discussion of information literacy instruction outside of the library field. A more multi-disciplinary approach to information literacy research and instruction will create opportunities for more substantial, curriculum-integrated and long-lasting instructional experiences that will benefit students throughout and beyond their academic careers”. IL needs to be treated differently form the usual programmes, e.g. Library Orientation, Bibliographic Instruction, provided earlier by libraries to acquaint users with information resources. IL should aim to, help users to reach the sought information but also to help them to organize, synthesize, evaluate,
use ethically. It is particularly of significance for those of us who are working in the academic institutions as it helps to inculcate critical thinking skills to enable the students to learn better. IL programmes need to be developed and provided by the LIS professionals in collaboration with the faculty and domain experts providing them the recognition in the society. With the increasing acceptance of e-resources in the society, it is the right time for us to take up the role and improve our professional image.

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