

An Overview of Information Literacy (Skills) in Academic Work.

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Abstract

Information literacy is becoming prevalent in educational system. It is also a vital part of university-level education. The emergence of information technology and later known as the information and communication technology increases the level of awareness in that particular area. Furthermore, the increasing of information in the global area had contributed to the needs of having good skills in managing information. People especially students should improve the information skills in order to become more educated in this 'information age' area. The purpose of this paper is to foresee the needs of Information Literacy (skills) in academic work. Having these abilities and skills, people can improve the knowledge and solve the problems.

Keywords: information, literacy, library, academic, skills, technology.

1.0 Introduction

1.1 Information Literacy and Information Technology

Information is one of the world's most important resources. It is needed to solve problems and make decisions which are affecting the future. Therefore, it is absolutely important to be able to access and use

information effectively and efficiently – that is, to be ‘information literate’. Information literacy is related to information technology skills, but has broader implications for the individual/students, the educational system, and for the society. In the broadest sense, information technology refers to both the hardware and software that are used to store, retrieve, and manipulate information. It also enables an individual to use the computers, software applications, databases, and other technologies to achieve a wide variety of academic, work-related, and personal goals.

Information literacy, while showing significant overlap with information technology skills, is a distinct and broader area of competence. Increasingly, information technology skills are interwoven with, and support, information literacy. A 1999 report from the National Research Council promoted the concept of "fluency" with information technology and therefore it was very useful in understanding relationships among information literacy, computer literacy, and broader technological competence. The report noted that "computer literacy" is concerned with rote learning of specific hardware and software applications, while "fluency with technology" focuses on understanding the underlying concepts of technology and applying problem-solving and critical thinking. The report also discussed on the differences between information technology fluency and information literacy as perceived in K-12 and higher education. Among these differences are; information literacy focuses on content, communication, analysis, information searching, and evaluation; as compared to information technology "fluency" which highlights more on a deep understanding of technology which gradually leads to a very profound repertoire of skills.

In recent times, the development of online social networks such as Facebook and Twitter has generated even greater interest. According to a correspondence of the Economist magazine, in January 30, 2010, Facebook, an online social networking site, which has been launched 6 years ago, now is having more than 350,000 million users. According to the correspondence, if the Facebook users were to comprise the nation, they would be the third most populous in the world after China and India. Thus, there is no doubt that more people are beginning to use information technology. Previously, computers were known to be used in the offices and information technology was mainly used by students and academicians. Currently, even bored housewives at homes are also using the information technology at a level which we do not imagine before, due to the development of online social network. According to the economic article in 30 January 2010, the users of Facebook have posted over 55 million updates per day and shared more than 3.5 billion pieces of content every week. The article further reported that Facebook site has expanded way beyond its American roots and today, 70% of its audience is staying outside the United States. Although facebook is the world’s biggest social network, there are a number of other search sites such as Myspace, with concentrates on music and entertainment. Another site LinkedIn which is another site targets career minded professionals whereas Twitter, is a networking service that allows its members to send out short, 140-character messages called “tweets”.

Besides, other social network sites include Orkut which is a goggle own service that is heavily used in India and Brazil, whereas QQ is widely used in China (Giles, 2010). Thus, it is evident that the use of information technology has reached and unprecedented the scale and it is expected to rise even further. Previously, computer illiterate homemakers, especially the older ones saw no reason to pickup information literacy skills. However with the development in the social networks, homemakers and families are picking up information literacy skills vehemently to stay connected, exchange information and gossip. Information literacy would inevitably develop some technology skills. "Fluency" with information technology may require more intellectual abilities than the rote learning of software and hardware associated with "computer literacy", but the focus is still on the technology itself. Previously,

many non-career homemakers and old retirees regarded information technology as something daunting and unnecessary. However, the socializing possibilities accorded by the online social networks provided strong motivation to this group to remain glued to the computer screen for hours to end. Skills which were previously considered to be daunting were picked up with ease due to the motivation provided by the online social networking sites.

While the online social networks are a boom in the use of information technology recently, there was already a steady growth in the use of information technology even before the advent of the online social networks. In fact, the information technology has almost rendered encyclopedias as obsolete. Students and academicians used information technology at an ever growing rate right from the 80's. Blog sites and online news together with YouTube technology provided the further boost in the use of information technology. Another attraction of information technology, it is less subjected to censorship laws compared to the printed media or even television. Except for some countries like China, which even wanted censorship for Google, online material is relatively free of institutional clampdowns (Giles, 2010). In nations where the mainstream media is controlled by the government, the people often resort to online sources for their news. The use of information technology and information literacy is expected to grow even further in the year's future.

1.2 What is Information Literacy?

Information literacy is a set of abilities requiring individuals to "recognize when information is needed and have the ability to locate, evaluate, and use effectively the required information." Information literacy is also increasingly important in the contemporary environment of rapid technological change and information resources proliferation. Information is made available through libraries, community resources, special interest organizations, media, and the Internet. Recently, information comes in unfiltered formats, raising questions about its authenticity, validity, and reliability. In addition, information is available through multiple media, including graphical, aural, and textual, and these pose new challenges for individuals in evaluating and understanding it.

Information literacy forms the basis for life-long learning. It is common to all disciplines, learning environments, and all levels of education. It enables learners to master the content and extend their investigations, become more self-directed, and assume greater control over their own learning. An information literate individual is able to:

- (i) Determine the extent of information needed
- (ii) Access the required information effectively and efficiently
- (iii) Evaluate information and its sources critically
- (iv) Incorporate selected information into one's knowledge base
- (v) Use information effectively to accomplish a specific purpose
- (vi) Understand the economic, legal, and social issues surrounding the use of information and access and use information ethically and legally

The term information literacy, which sometimes being referred as information competency, is generally defined as the ability to access, evaluate, organize, and use information from a variety of sources. Being an information literate requires knowing how to clearly define a subject or area of investigation; select the appropriate terminology that expresses the concept or subject under investigation; formulate a search strategy that takes into consideration different sources of information and the varieties of ways on how

the information is organized; analyze the data collected for value, relevancy, quality, and suitability; and subsequently turn information into knowledge (ALA, 1989).

Information literacy is not the same as computer literacy (which requires a technological know-how to manipulate computer hardware and software) or library literacy (which requires the ability to use a library's collection and its services), although there is a strong relationship among all these concepts. Each of these literacy skills requires some level of critical thinking, because knowledge on how to use the technology must be applied. , Unlike library literacy, information literacy is more than searching through an online catalog or other reference materials because information literacy is not a technique, but a goal for learners (Gilton, 1994).

Information literacy requires an awareness of the way in which information systems work, the dynamic link between a particular information need, and the sources or channels required to satisfy that need (Darch et al., 1997). Information literacy can be defined as the ability to identify, locate, evaluate, and select information in all formats in order to use it effectively. To be an 'information literate', one must know how to use the tools and services available in the library and on the internet. The individual must also know how to evaluate the information that was found. Bawden (2001) has produced a review article about the interpretations of information literacy, and alternative words and phrases that are frequently used (e.g. information competency, mediacy). The phrase "information skills" (rather than information literacy) is used, for example, by the Standing Conference of National and University Libraries (SCONUL) in the name of its Task Force, and was used by the Joint Information Systems Committee (JISC) when tendering for a project looking at training in the UK further and higher education (The Big Blue, 2001).

Much of the literature has been produced by librarians, and there are clear links with practice of bibliographic instruction and library skills training. Most of the definitions of information literacy have been in terms of the 'information literate' person rather than of information literacy itself. Carbo (1997) notes that Zurkowski (the former president of the US Information Industry Association) used the phrase "information literates" in 1974 to identify people "trained in the application of information resources to their work". Plotnick (1999) ,ACRL (2000) and numerous others quote the American Library Association (1989) in saying that:

"To be information literate, a person must be able to recognize when information is needed and have the ability to locate, evaluate and use effectively the needed information."

Other definitions of the information literate person tend to cover the same elements, but expand in one way or another. For example, Doyle (1992) defined an information literate person as one whom "recognizes the need for information" such as;

- (i) recognizes that accurate and complete information is the basis for intelligent decision making;
- (ii) identifies potential sources of information;
- (iii) develops successful search strategies
- (iv) accesses sources of information, including computer-based and other technologies;
- (v) evaluates information;
- (vi) organizes information for practical application;
- (vii) integrates new information into an existing body of knowledge and
- (viii) uses information in critical thinking and problem solving

- (ix) Lenox and Walker (1993) also define information literacy by characterizing the information literate person: one who has the analytical and critical skills to formulate research questions and evaluate results, and the skills to search for and access a variety of information types in order to meet his or her information need. Shapiro and Hughes (1996) provide a broader vision in referring to "a new liberal art that extends from knowing how to use computers and access information to critical reflection on the nature of information itself, its technical infrastructure, and its social, cultural and even philosophical context and impact".

(Webber et al., 2005) defines literacy skills:

- (i) In Marketing, information literacy as: 1) Accessing information quickly and easily to be aware of what is going on; 2) Using IT to work with information; 3) Possessing a set of information skills and applying them to the task in hand; 4) Using information literacy to solve real-world problems; 5) Becoming a critical thinker; and 6) Becoming a confident, independent practitioner.
- (ii) In English, information literacy as: 1) Accessing and retrieving textual information; 2) Using IT to access and retrieve information; 3) Possessing basic research skills and knowing how and when to use them; and 4) Becoming confident, autonomous learners and critical thinkers.
- (iii) In Chemistry, information literacy as: 1) Accessing and searching chemical information; 2) Mastering a chemist's information skill set; 3) An essential part of the constitution, creation and communication of knowledge
- (iv) In Civil Engineering, information literacy as: 1) Accessing and retrieving data and information; 2) Applying and using information; 3) Analysis and sense making; 4) Creating, and incorporating information into a professional knowledge base

In order to use information efficiently and effectively, one needs to develop information skills such as being able to:

- (i) Find information in a variety of formats – e.g.: print, online etc
- (ii) Find information from a variety of sources – e.g.: people, organization etc.
- (iii) Find information within sources – e.g.: using an index and abstract.

Other important skills are being able to ask questions such as

- (i) Select, evaluate and if necessary, discard information;
- (ii) Combine information from different sources;
- (iii) Present the most relevant information;
- (iv) Present information according to the audience; and
- (v) Gauge the success of the presentation

As mentioned above, in order to use information effectively, it is important to become information-literate people who know how to find, organize, evaluate and use information effectively to solve a particular problem or make a decision. Therefore, information literacy involves knowing:

- (i) What information is available? (ii) Where it might be; (iii) How it can be located and search;
- (iv) How it can be retrieved and stored; and (v) How it can be processed and presented.

2.0 Why should students be concerned about Information Literacy?

2.1 Implications for Learning

Why is information literacy important to the students? Studies have shown that students entering the university environment without fundamental research and information competency skills will face problems especially in doing their research work. According to the data procured by Malliari et al. (2008), it is evident that the overwhelming majority (93.5%) of the teaching staff at the Alexander Technological Educational Institute of Thessaloniki (ATEITH), Greece the institution from where his sample came from, students were required to write papers, specifying the need for bibliographical research in 90.2 % of cases. Thus, it has obviously shown that writing papers is a substantial component of the education process at that institution and therefore lends itself to drawing conclusions on the students' needs and the difficulties they face. Without information literacy, it would be difficult for the students to source for information. If the students were to resort to the traditional methods of making academic inquiry, their progress would be cripplingly slow.

Besides, the manual searching from text is not only tedious but the information may not be updated. With the advent of information technology, a lot of new information can be uncovered in various areas. Therefore, it does not take long for the printed text to go out of date. Any new knowledge can only be included in a new edition and by the time the new edition comes out in print, there would be even newer knowledge uncovered in the interim. on a daily or hourly basis. Therefore, information technology is able to keep pace with the torrid advance in a new knowledge. Students can avail themselves of the latest developments in their field of study. Information technology not only enables rapid access to sources of information but it also allows the practitioners to keep abreast of the latest development of their fields.

Research or academic work is the process of inquiry and investigation in which the students examine issues, probe topics, and ask questions. Students will be doing research in their classes when they write papers, complete projects and do class presentations. In the academic world, there can be no writing without research. Any postulation made by a student needs to be backed up by the authorities in their field, as students' writing might merely becomes a frivolous statement. Information literacy skills are necessary to conduct good research. These skills allow the students to sift through large amounts of information available in order to select the best information in support of the research. Information technology enables them to sift through massive amounts of information in the shortest time possible.

The American Psychological Association's Board of Educational Affairs (APA) recognizes information literacy as a specific learning objective for undergraduate students (Murray, 2002). Among the learning goals upheld by the APA is that, "students should demonstrate information competence and the ability to use computers and other technology for many purposes," including the demonstration of competent, ethical, and responsible use of information in academic work (American Psychological Association, 2000, p. 14). "Undergraduate education should be designed as a continuum that prepares students for continued learning and professional work through developing their talents to formulate questions and seek answers" (Boyer Commission on Educating Undergraduates in the Research University, 2001, p. 18). To obtain information that one seeks for specific purposes, a number of options are available. One is to utilize the information retrieval system, such as in a library or in databases accessible by computer from any location. Another option is to select an appropriate investigative method for observing phenomena directly. For example, physicians, archaeologists, and astronomers frequently depend upon physical examination to detect the presence of particular phenomena. In addition, mathematicians, chemists, and physicists often utilize technologies such as statistical software or simulators to create artificial conditions in which to observe and analyze the interaction of phenomena. As students progress through their undergraduate years and graduate programs, they need to have repeated opportunities for

seeking, evaluating, and managing information gathered from multiple sources and discipline-specific research methods.

However, the use of this option would depend on the peculiar needs of the practitioner. Students involved in research may prefer library databases which they might even be able to access from the comfort of their home if they are in possession of the particular password or code. Thus, it can be seen that for today's students, information literacy is rather indispensable. Certainly, those people who find themselves on the disadvantaged side of the digital divide are going to find themselves handicapped when it comes to sourcing for new knowledge.

Becoming information literate will involve a drastic change from the way many students are accustomed to learning. First of all, it requires students to be more self-directed in their learning, whereas, previous tutors and lecturers may have to direct the students for various printed sources where relevant material can be found. Without search guidance, it would be hard to locate relevant information among a sea of printed material. Previously, the students relied heavily on the work of their predecessors or seniors so the amount of new knowledge gained can be minuscule. Today, information technology allows the students to take the initiative in sourcing for the needed material. This kind of independent, active learning prepares students for real-life problem solving (Breivik et al., 1989). Also, students will be more responsible for their own learning either individually or in work groups. As they become more competent with their use of information resource options, the awareness of their individual styles of learning and preferred ways of assimilating knowledge is increased (Bleakley et al., 1994).

Previously, when only printed materials are referred to, students were only able to view limited amount of material which may not be presented in a manner suitable to them. When printed materials used to become the sole source of reference, it is as if one size must fit all. With information technology where sourcing for information takes place in nano seconds, the student has a very wide range of options to choose from. Just by a few clicks of the fingers, the student is able to access formidable store information which comes from all corners of the world. Information technology makes it possible for students to access astronomical amounts of information at rapid speed. The world contains an unimaginably vast amount of digital information which is getting vaster ever more rapidly, (Economist, 27 February 2010), which was impossible once before. The same article also reported that the world is undergoing an industrial revolution of data which is revolutionizing not only the academic world but other spheres such as business to science and from government to the arts.

One successful method for developing information literacy skills is through resource-based learning which involves having students to assume more responsibilities for locating the very materials from which to learn. This approach develops life-long learning skills because students are learning from the same sources which they will come to use in their daily lives such as books, newspapers, televisions, databases, government documents, subject matter experts, and others (ALA, 1989). Thus, information technology not only makes an abundance of information available but it also makes the student more self-reliant. Previously the lecturer was thought as a Guru from which all learning and wisdom emanated, currently the database becomes the new Guru. The difference being that the digital guru is managed and customized by the user in his own way, in his own time and at his own pace.

Additionally, resource-based learning provides an added advantage (i.e., it allows students to choose materials that match their academic levels and preferred learning styles thus individualizing the learning process for the individual student). Korobili et al., 2009 mentioned that a significant 64.5 % considers

that an information literacy course should be integrated in their curriculum. Korobili is no doubt correct as the proliferation of data may ironically make them increasingly accessible as people grope about trying to make sense of all these data. Therefore, as per Korobili's postulation, information literacy should be integrated in the curriculum so that students become smart users of the digital repository and are able to become selective and discerning who are able to skillfully navigate the unimaginably vast amounts of data at near the speed of life and zero in on areas relevant to them.

2.2 Implications for Librarians and Libraries

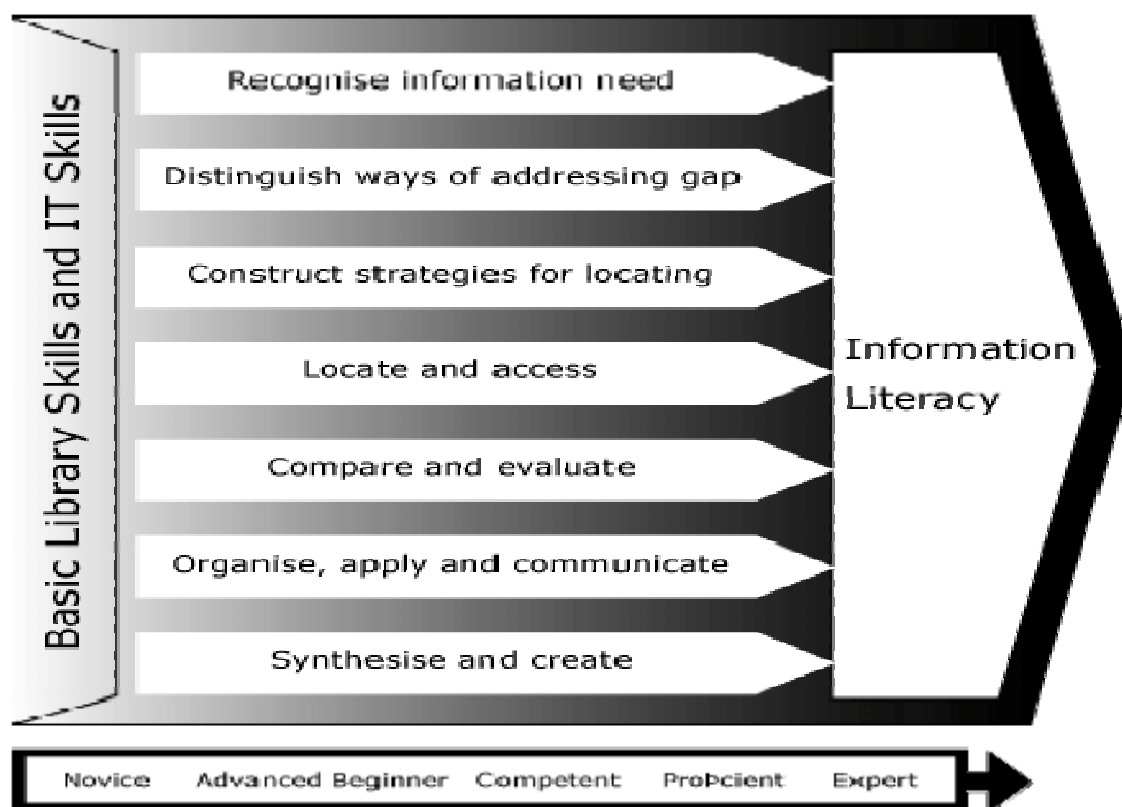
Librarians led the way in the early 1970s in conceptualizing the idea of information literacy and its relationship to lifelong learning. Early development of the concept of information literacy frequently focused on the future role of libraries and librarians in helping with the use and application of information (Behrens, 1994). The impact of moving from text-based learning to resource-based learning will involve heavier use of library materials and demand for varied media resources, including printed and non-printed. Consequently, university administrators will need to re-evaluate on how funds are distributed between the textbook and the library media resources budget. Public libraries will have to coordinate more closely with universities and other learning sites to ensure sufficient access to information resources and technology for all ages and abilities to remain a strong community resource for life-long learning. The libraries should be highly adaptive of the new digital possibilities and ensure that information technology facilities are user friendly so that their roles as life-long learning resources are not jeopardized.

3.0 Model of Information

The model below shows the Seven pillars models of Information Literacy developed by the society of College, Nationals and University libraries (SCONUL);

SCONUL Seven Pillars Model for Information Literacy

© Society of College, National and University Libraries



The Seven Headline Skills expanded

Author by: Sheila Webber

Pillar 1. The ability to recognise a need for information

Recognising that you have an information need, and being able to analyse that need are essential first steps to information literacy. At university, assignments and course work present an obvious “information need”. However, students may find it difficult to move beyond the wording used by a lecturer (e.g. an essay title) to identify the gap between what they already know, and what they need to know to complete the assignment. Research has shown that this becomes even more of a problem in the workplace, where business people may not see the information need within the business problem.

Pillar 2. The ability to distinguish ways in which the information ‘gap’ may be addressed

Once you have identified where the gaps in your knowledge lie, then you will need to have an awareness of the different ways in which you might meet your information needs. Information can be obtained from a wide variety of sources and channels: books, electronic journals, websites, people, organisations etc.

Mastery of this Pillar involves not just knowledge of what resources are available, but also being able to identify which ones would be a “best fit” for the task in front of you.

Pillar 3. The ability to construct strategies for locating information

There is no strategy that suits all types of information resource. One part of becoming information literate is learning that, for each new source you encounter, you need to stop and think how you can get the best out of it. The best strategy for searching Google is not exactly the same as the best strategy for using a library catalogue, or for finding relevant information within a book, or for motivating an expert to respond to your email request for information.

Pillar three therefore involves understanding that you need to learn something about how each kind of information resource works, so that you can match your information need against it, to produce effective results.

Pillar 4. The ability to locate and access information

Once you have identified the most appropriate information resources to use, and strategies to get the best out of them, then you need to have the knowledge and skills to access the information resource and extract the information. This may involve developing associated skills, such as the use of Information and Communication Technologies (ICTs) and related academic literacy such as note-taking. Someone who is proficient in this Pillar will be fluent in different kinds of search technique: for example understanding the best way to develop a search in a relevant ranked search engine, or one using Boolean logic.

You will also know that different kinds of information resource are useful at different stages of the search: for example, abstracting services and citation searches can provide an effective way to identify key references. Building on the awareness of relevant resources developed through Pillar 3, you will feel confident about accessing and using all the resources appropriate to your information need. This Pillar does not just cover search activities. It also involves being proficient in acquiring information in any appropriate way e.g. effective web browsing, or using services such as RSS feeds to provide ongoing information on the relevant topic.

Pillar 5. The ability to compare and evaluate information obtained from different sources

Information is not necessarily neutral: different kinds of information resource, author and publisher will provide different perspectives. Which perspective is the right one for you will depend on the nature of the information needed. What is important is to be able to evaluate the piece of information in front of you carefully and critically in relation to that need. To do this, you will need some knowledge about the way the media operates, and certain processes which are particularly important in the academic context, such as peer review of scholarly articles.

With some forms of information (e.g. numeric or chemical) skill and knowledge in manipulating data, specialist software may be needed in order to evaluate and compare.

6. The ability to organise, apply and communicate information to others in appropriate ways

Information is usually obtained for a purpose, and very often this purpose involves communication and sharing. In the academic context, this may involve communicating with tutors and fellow students; as in the workplace and in the personal context, it may involve managers, clients, family, or the public. The medium used will also vary, for example in writing, face to face, on the web, or via email. An information literate person will be able to communicate information effectively using the medium appropriate to the task.

*In some contexts, for example research projects and theses, being able to **organise** the information for easy retrieval and communication will be important. This may involve understanding the use of bibliographic software and other personal information management tools.*

*In all circumstances, understanding how to use information **ethically and legally** is vital. Through this Pillar, you will understand the basics of intellectual property rights and law, and be able to use and cite information appropriately.*

*Finally, this Pillar encompasses knowing about the **application** of information in different situations and for different purposes: for example in problem solving and decision making.*

Pillar 7. The ability to synthesise and build upon existing information, contributing to the creation of new knowledge

Someone who is adept in the seventh Pillar will be able to identify, select, compare and analyse needed information to produce a synthesis which provides a new perspective, and which may enable the creation of new knowledge. For example: you might produce a critical business report building on analysing existing information to produce fresh insights and forecasts; you may create a website which links to and synthesise other information, but at the same time include new content to present a unique product.

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The Seven Pillars model was designed to be a practical working model which would facilitate further development of ideas amongst practitioners in the field and would hopefully stimulate debate about the ideas and how those ideas might be used by the library and other staff in higher education, concerned with the development of students' skills. The model combines ideas about the range of skills involved with both the need to clarify and illustrate the relationship between information skills and IT skills, and the idea of progression in higher education embodied in the development of the curriculum through first-year undergraduate up to postgraduate and research-level scholarship.

In 2004, five years after the model was first introduced in "Information skills in higher education: a SCONUL position paper", the model was redesigned. Four versions of the original model were created to aid clarity in the presentation of the model. This page presents the four new models which can be downloaded and saved to facilitate further development.

3.1 Other Information Literacy Models

The following are the models for Information Literacy which generally and widely used across the United States. Different places develop their own stages based on one of these models.

1. The Big6 (Eisenberg and Berkowitz, 1990)

www.big6.com

Developed by Mike Eisenberg, Professor of Information Science at Syracuse University and Bob Berkowitz, a practicing library media professional in Syracuse, New York. One of the most well known models in the field and it is being taught widely to students as a guide for their research, especially at the K-12 level. The Big 6 steps include: task definition, information seeking strategies, location and access, use of information, synthesis, and evaluation.

2. Information Search Process (Kuhlthau, 1989)

http://library.humboldt.edu/ic/general_competency/kuhlthau.html

Developed by Carol Kuhlthau, a Professor of Library and Information Science at Rutgers University, New Jersey. This model shows how users approach the research process and how users' confidence increases at each stage. These stages include initiation, selection, exploration, formulation, collection, presentation and assessment.

3. Stripling and Pitts Research Process Model (1988)

<http://witloof.sjsu.edu/courses/250.loertscher/modelstrip.html>

This model guides students through the stages of creating a research paper. The 10 steps begin with choosing a topic and end with creating and presenting the final topic.

4. Pathways to Knowledge Information Skills Model (Pappas and Tepe, 1995)

<http://www.pathwaysmodel.com/the-model/>

Teaming with the Follett Software Company, Professor Marjorie Pappas and Follett's Director of Curriculum, Ann Tepe, developed an elaborated model of information literacy complete with recommended strategies, forms of expression, and methods of teaching and learning embedded in the model. The stages in this model include appreciation, pre-search, search, interpretation, communication and evaluation.

Comparison of Information Literacy Models

Eisenberg/Berkowitz Big6 Information Problem Solving	Kuhlthau Information Seeking	Pitts/Stripling Research Model	Pappas/Tepe Pathways to Knowledge
1. Task definition 1.1 Define the problem 1.2 Identify	1. Initiation 2. Selection 3. Formulation of focus	1. Choose a broad topic 2. Get an overview of the topic 3. Narrow the topic Choose a broad topic	1. Appreciation

information Requirements		4. Develop thesis/ purpose statement	
2. Information seeking strategies 2.1 Determine range of sources 2.2 Prioritize sources	4. Exploration (investigate information on the general topic)	5. Formulate questions to guide research 6. Plan for research and production	2. Pre-search • Develop overview • Explore relationships
3. Location & access 3.1 Locate sources 3.2 Find information	5. Collection (gather information on the focused topic)	7. Find, analyze and evaluate sources	3. Search • Identify information providers • Select information resources & tools • Seek relevant information
4. Use of information 4.1 Engage (read, view, etc.) 4.2 Extract info		8. Evaluate evidence, take notes, compile bibliography.	4. Interpretation • Interpret information
5. Synthesis 5.1 Organize 5.2 Present	6. Presentation	9. Establish conclusions/organize information in outline 10. Create and present final product	5. Communication • Apply information • Share new knowledge
6. Evaluation 6.1 Judge the product 6.2 Judge the process	7. Assessment (of outcome/process)	[Reflection point – is the paper/project satisfactory]	6. Evaluation • Evaluate process and product

This article was the framework for the book, *Information Literacy: A Review of the Research* (2002). Hi Willow Research and Publishing. (www.lmcsource.com).

4.0 A Strategy for Using Literacy Skills

What is the strategy for using literacy skills? In order to obtain the information, students may utilize an information retrieval system, found in a library or in databases accessible by computer from any location. Therefore, the library is the first place where the students should go to find the information. In Malliari et al., 2008 research stated that a considerable proportion of the teachers (47%) reported that their students encountered problems in finding and using source material in the library. Most of these have to do with using keywords to describe a topic, searching in the OPAC, and locating the material in the Library. It is, rather, “a complex of knowledge, skills, and attitudes which must be developed over a period of time through repeated and varied experiences in the use of library resources” (Knapp, 1956). The library has a tool to identify materials located there and identify information in sources which are

not owned by the latter. Most of the tools used in libraries are in the electronic format, such as online catalogs and electronic databases; print format, such as card catalog and print indexes; books, magazines and journals. Most of the books and other materials available in libraries are in print format, although materials such as newspaper and magazines articles increasingly have been made available in electronic format. Malliari et al., 2008 stated a clear majority of 61.7% students mentioned that they were given assignments that required library use.

Most of the libraries have used Online Public Access Catalog (OPAC) as a tool to find information. OPAC is an online to a database containing all the cataloging information of a particular library only. It may also provide access to the collections of other. By using OPAC, the students will find the required item via the title and then get the rest of the information they need – such as the author, date of publication, call number and so on.

From the library, students can get information through a database. A database contains machine-readable record for the purpose of information storage and retrieval. Vast and continuously updated file of information abstracts or references on a particular subject. On-line databases are designed so that by using subject headings, keywords, key phrases, or author's, users can quickly and economically search for, sort, analyze and print out data on their terminal.

The first databases were:

-) Bibliography, providing information about a given source: author, title, publisher, price, etc (ii) Citations, giving location of article, the journal which appears – date, volume, and pages with abstract (iii) Directory-type providing names, addresses about persons (iv) Statistical, providing statistics about various subject (v) Legal, giving citations to and information about laws, court cases

The Internet is 'another place' to find information. The Internet is a worldwide network of large computers. Information is available on computers connected to this network. The Internet allows us to use a personal computer to connect to and use information on this network. Anyone with access to the Internet can publish information on it. Salaway et al., 2008 reported in *The ECAR Study of Undergraduate Students and Information Technology: . . . a full 79.5% give themselves glowing reports about their ability to "use the internet effectively and efficiently to search for information," with half of them rating themselves as "very skilled" and another third as "experts."* Further, about half of [all] respondents say they are "very skilled" or "expert" when it comes to "evaluating the reliability and credibility of online sources of information" or "understanding the ethical and legal issues surrounding the access and use of digital information" (Salaway et al., 2008, p. 11).

Notwithstanding the above, it must be bear in mind that there are astronomical amounts of information on databases which lead the databases to quantify the information in terms of petabytes. A petabyte of information may contain loads of information equivalent to 165 times of the books in America's library of congress (The Economist, 27 February 2010). The same article mentioned that quantifying the amounts of information that exists in the world is hard, however, the compound annual rate was shown to accelerate by 60%. According to 2007 study by the International Data Group (IDG), a market research firm, around 1200 Exabytes of data will be generated this year. Hal Varian and the late Peter Lyman of the university of California of Bekerley, who pioneered the idea of counting the world's bits, came out with a smaller amount of 5 exabytes in 2002 as they only counted the stock of original content.

In view of the monstrous amount of data available, users such as students should know how to manage

the information so that they will not be looking for the needle of the haystack. What they need are details referring to the information, where the librarians and computers scientist call it metadata (The Economist, 27 February 2010). Lippincott et al., 2004 studied on information seeking strategies of the undergraduates, found that 90 % of them used search engines on a daily or weekly basis and 19 % used the library daily. In another study on undergraduate engineering students, Kerins et al., 2004, found that the majority of the students indicated that the internet was the first source of information they used for projects, course assignments and course-related information (Mittermeyer, 2003).

Similarly, Seiden, Szmborski and Barbara as cited in Callinan (2004) conducted a focus group study with undergraduate students from Skidmore College in New York and found that the students had a strong overall preference for digital resources. These preferences were explained as a lack of familiarity of printed sources. Folster (2004) reviewed social scientist information seeking patterns and found that they preferred journals instead of other sources, to follow citations instead of using indexes or abstracts to find articles. The World Wide Web (WWW) is the most important tool to use to find information on the Internet. On the WWW you get web pages that contain information. Databases for articles are beginning to be made available on the WWW, but they cost money. Many libraries are beginning to subscribe to these electronic databases on the WWW and make them available for their users. In March 24, 2009; Google announced the following improvement to their search service: *We're deploying a new technology that can better understand associations and concepts related to your search, and one of its first applications lets us offer you even more useful related searches . . . For example, if you search for [principles of physics], our algorithms understand that "angular momentum," "special relativity," "big bang" and "quantum mechanic" [sic] are related terms that could help you find what you need (Allon et.al 2009).*

5.0 Conclusion

Information Literacy, which encompasses knowledge of one's information needs, is a prerequisite for participating effectively in the information society, and it is part of the basic human right of life-long learning. Also, it concerns the control over how information is created, processed, organized, stored, distributed and used by the students in their academic work. Moreover, these skills were required in order to complete their assignments as well as know how to start their 'journey'. Various tools had been identified earlier that can be used to find information. In that case, the library must play the important role. Student may have picked up the skills to send electronic mail, chat and download music, but many have not learned how to effectively locate, evaluate, and analyze information.

Moreover, the skill is 'compulsory' when the lecturer assigns them to do assignments. The lecturer wants to see the quality of students' work, and students have to become more confident in their ability to complete assignment, carry out research projects and become active, independent learners. This paper has also emphasized that information literacy is more than computer literacy or the ability to use technology. as a matter of fact, it is the ability to find, evaluate, analyze, integrate, communicate, and use information to solve problems, create new ideas, make informed decisions, and turn data into meaning. It is the responsibility of the entire college or university to help the students to become information literate, an essential element for future success. The university should organize many information literacy programs as a result of seeking new directions.

Currently, some of the universities are designing online tutorials for their information literacy

programme and at the same time, they are also trying to implement the online tutorials in the near future. One critical element in developing information literacy skills is the role of lecturer in the university. If the lecturers are convinced about the significance of these skills, they may become willing partners in the process and encourage the use of library resources and services. They need to work collaboratively with librarians staff for preparing assignments and projects that would require the use of these information sources. The lecturers need to be made aware of the information literacy's content and the appropriate pedagogical technique they can use. Last but not least, The Ministry of Higher Education should consider offering seminars and training sessions for the lecturers as well.

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