Learning and teaching theories, instructional strategy and instructional design for information literacy programs: a model for academic libraries

Kyriaki Balta

University of Macedonia Library
Digital Library & Institutional Repository Office
156 Egnatias Str. PO Box 1591, Thessaloniki, Greece
balta@uom.gr

Abstract

Changes in educational thinking, the explosion of digital information and the rapid advancements in technology comprise major challenges academic libraries have to face when it comes to their educational role within the institution they operate.

Academic librarians, as facilitators of the educational procedure, design and deliver information literacy (IL) programs. In most cases, they take up a new role as instructors in these programs, bringing the academic library in the center of the institution’s educational procedure. This necessitates the acquisition of new skills, besides the ones gained by their typical library training, such as instruction skills, pedagogical skills and educational design skills in order to become effective instructors.

More than a century, models for the design and provision of IL programs in higher education, have been a major discussion topic for many researchers. Several models have been proposed and analysed, covering subjects from the adaption of a learning theory up to the design of the educational material.

The proposed model consists of 18 elements, aiming not only to describe the educational goals, techniques and material but also to enable students to approach IL as an integrated learning environment.

Keywords

Information Literacy, Information Literacy Programs Design Models, Instructional Strategy, Instructional Design, Learning Outcomes, Learning Theories, Constructivism

Introduction

It is widely accepted nowadays that skills such as information retrieval, evaluation and usage are an every day necessity for all citizens. As a result of this, our societies need modern higher education systems, that emphasize on knowledge management, information technologies and lifelong learning along with sciences. As key players in this procedure, higher educational institutions need to stand up to this challenge and prepare their students adequately. Academic libraries, as an integral part of any higher education institution, turned their emphasis from collection development and information provision to educating their users, in order to acquire these skills that will make them capable of retrieving, evaluate and use information under a model of self-serving.

Changes in educational thinking, the explosion of electronic information and the rapid technological changes constitute big challenges academic libraries have to face, concerning their educational role. The most common educational programs academic libraries offer are those of IL. Academic librarians, acting as educational designers and facilitators, take up new initiatives by adding a new role to their libraries. All these, impose to academic librarians the acquisition of a new sets of skills such as: knowledge of educational design, pedagogical theories, didactics and instructional skills (Peacock, 2001; Powis, 2004).

History, definitions and standards of Information Literature

Efforts to provide IL programs in school, academic and public libraries began in the 19th century (Lee, 1966). Indications of IL courses exist in Harvard University since 1820 (Salony, 1995). In 1876 the
didactic methodology changes in American school and higher education, including courses such as reading, independent study and research instead of just lectures and textbooks (Salony, 1995). In 1886, Melvyl Dewey noted about textbooks: “they hand their overrated position to much cleverer and wider approaches” and he continued “professor after professor send their classes or escort them to the library and teach them how to perform research, use the books, going beyond school education methodology and memorized recitation of a text” (Dewey, 1886, p. 50). Within the same period, Otis H. Robinson 1 (1880), described knowledge acquirement as “learning how and where knowledge is gained”. George H. Baker 2 (1897), noted that: “it is very important for students and their own benefit to know something about the library and its usage”. In 1897, Harry H. Koopman 3 taught 30 3 hours classes on library usage and Cyrus Adler 4 (1897) stated at his 1897 ALA Annual Conference presentation “I believe that a large number of students don’t know how to use books that will help them as professionals...I also believe, that somehow we have to educate them because we ought it to them”. According to Rubin (1997), Azariah Smith Root, director of the Oberlin College Library, during 1887-1927, designed three IL courses described in Oberlin College Catalog 1899 as: a) use of the library, b) elementary bibliography, c) history of the printed book. As we see, the explosion of sciences during the 19th century lead to the development of experimentation in providing IL courses either in the form of seminars or as part of the educational programs.

During the last decades scientists, engaged in an extensive dialogue on the definition of the term IL and its content in particular. In 1974, Paul Zurkowski defined the term as: 1) the use of information at work, 2) the techniques and skills necessary for the use of information, 3) the use of information in problem solving (Behrens, 1994; Corrall, 2008). Many scientists accepted that the term IL replaced terms such as: library instruction, bibliographic instruction, user education (Rader, 1991; Snively & Cooper, 1997; Bruce, 2000). In 1979, Information Industry Association defined the information literate person as someone who: “knows how to use the techniques of information tools in problem solving” (Behrens, 1994; Garfield, 1979). Typical examples of definitions of the term given during the same period are: a) the position text of Mancall, Aaron and Walker (1986) for US National Commission on Library and Information Science, stating the necessary information skills (Spitzer et al, 1998), b) Kuhltau’s (1987) view that IL is: “not only a set of acquires skills but a way of learning”, c) ALA’s statement (1989) that “IL is a model of resource-based learning that describes the information literate person as someone who is able to identify when information is needed, has the skills to locate it, evaluate it, and finally effectively use it”. In the ’90s, ALA’s definition was widely accepted. By that time, IL matured as a concept and scientists started to search for new ingredients to add to it, under the new light of life long learning concept that started to appear in educational thinking. In 1992, Doyle, after performing a Delphi study, defined information literature as: “the ability to access, evaluate and use information found in several resources”. Since that, major organizations dealing with library science issues, gave their definitions of the term. ALA-ACRL (2000), CAUL (2001), IFLA (2006) and the Alexandria Proclamation (2005) described IL as: “an educational procedure that aims at the development of skills on information research, analysis, evaluation, use, share, diffusion in ethical ways regardless its typology, content and organization”. In 1998, Unesco with its “Framework for priority action for change and development in higher education” and “World declaration on higher education for the twenty-first century: vision and action”, introduced a student-centred model of education, in order to promote the idea of citizens with a critical mind in problem solving, finding solutions and social responsibilities take up. A lot of work to define the term has also been done by the EU. With several texts (EC, 2000:5; EC, 2000:11; HECTIC, 2001; COIMBRA Group of Universities, 2002; EC 2003, EUA 2003) many EU related organizations stated: “students should be able to learn how to use electronic information, in order, to improve their working and social skills”. This statement reflects the point of view of most societies, underlying the need for IL programs provision in all levels of education.

IL programs in academic libraries

According to Nuget and Meyers (2000), the academic library should serve as: “an access point to information, work station for research activities of the institution and finally as knowledge lab”. This, along with the fact that higher education shifts from a “teaching” point of view to “learning” in

---

1 Librarian, Rochester University Library
2 Librarian, Columbia University
3 Librarian, Brown University
4 Librarian, Smithsonian Institution
educational design, shows how important is for the academic libraries to provide IL courses, that will allow the students to acquire information related skills, while experiencing a continuously changing experience within a higher educational institution. Under this notion, Grafstein (2002), Gee (2005) and Gillani (2003) described three major categories of skills that students should have or must develop during attending higher education courses: a) generic or primary competences (skills they already posses when they came to higher education), b) subject –specific or secondary competencies (skills they will acquire during their presence in higher education, science related) and c) interdisciplinary skills (skills they will acquire during their presence in higher education, information related).

Many scientists also described the skills needed by the academic librarian who will teach IL (Peacock, 2001, Powis, 2004, Young and Harmony, 1999, Kirk, 1995, CAUL, 2001, Core, 1996, Albrecht and Baron, 2002, ALA, 1999, Mandernack, 1990, Oberman, 1998, Shonrock and Mulder, 1993, Akers, 2004, Cleyze, 2005, Lynwood, 2001, Mitchell, 2001, Nalani Meulemans and Brown, 2001, Patterson and Howell, 1990, Powell, 1988, Powell and Creth, 1986, Smith, 1982). Peacock (2001) noted that: “librarians who will teach such programs should equally possess library science skills and educational skills”. This fact makes more than necessary the collaboration between academic librarians and educators, in order to create a successful IL program. Such programs are fundamental in all levels of education. They allow both the active involvement and the critical thinking development of the students. Instead of the typical consumption of pre-composed data packages and educational material (Dewald et al. 2000), they help students use information not only within an educational setting but through their whole lives. In the relative literature, we see a number of models for IL programs design and provision by academic libraries. Dabbour (1997), El mborg (2003) and Pilerot & Hiort af Ornas (s.a.) stated that autonomous action and full awareness of the library’s value accomplished better when the used information is thematically linked to specific courses. Corrall (2008), in her study of the 10 British Universities’ IL programs, found that embedment of such a program to the existing content of a specific course, is the most effective technique to provide it. According to Bundy (2004), who commented Bruce’s (2004) opinion of how such a program should be offered in higher education students, four different ways with escalating percentages of sophistication exist: a) as a course that would be offered through personalized material packages and didactics (generic program), b) as a course that would be offered through personalized material packages and didactics that will supplement the main educational program (parallel program), c) as an autonomous course that would be offered through personalized material packages and didactics and it will support the rest of the educational program (integrated program) and d) as part of each course in which the students will have constant interaction with information (embedded program). When choosing a model for an IL program provision, every academic library should take into account several factors such as:

- the structure and culture of the parent organization
- the structure and culture of the educational programs
- the structure and culture of the library
- the human resources of the library
- the nature of the courses offered by the institution
- co-operation and relationships developed by the library within and outside of the institution
- the library’s infrastructure
- the library’s concept about its role within the university and the educational process

As we see, the final decision is unique as every academic library is.

Models for IL programs design: general design vs goal driven design

How an IL program will be designed, organized and finally offered is closely related to its goals, means and human resources. Speaking about this type of design, we refer to the design of the whole program and not one or more of its components. The main tendencies found in relevant literature are: a) the general design for such programs and b) the goals driven designed. In the former category, Curzon and Lampert (2007) proposed a design model consisting of 18 elements covering all parameters of the design. (pic. 1)
Another example of this category is Addie (pic 2.) (Branson et all., 1975), a model that consists of 6 sequent steps of action, each one leading logically to the next.

In the later category, a widely accepted goals driven model in IL programs design is the “Nine Steps Plan” by Michael Cook which was published in Marland’s book in 1981. Cook proposed a 9 questions-goals program design that includes the following: 1. What do I need to do? – (formulate and analyze need), 2. Where could I go? (location), 3. How do I get to the information? (access), 4. Which resources shall I use? (evaluation), 5. How shall I use the resources? (analysis and relevance), 6. What should I make a record of? (sorting), 7. Have I got the information that I need? (interpreting, analyzing, synthesizing, evaluating), 8. How should I present it? (communication), 9. What have I achieved? (evaluation). In 1985, Kuhlthau proposed her ISP (Information Seeking Model) (pic. 3) according to which there are 6 stages in information research, each one also defined by its goals. These stages are: 1. initiation, 2. selection, 3. exploration, 4. formulation, 5. collection, 6. presentation.
The main characteristic of this model, is the description of its goals in terms of their relation to emotions during the information seeking process. It describes them in three different emotional levels as: 1. the emotional experience, emotions, 2. the cognitive experience, thoughts and 3. physical experience level, actions. Another model of this category is Eisenberg’s and Berkowitz’s (1990) Big6 (pic 4.). According to Big6, the path to learning proceeds in 6 stages each one consisting of 2 steps. The Big6 is widely used because of its simple and clear design. The 6 stages and their steps are: 1. Task definition (1.1. define the information problem, 1.2. identify information needed), 2. information seeking strategies (2.1. determine all possible sources, 2.2. select the best sources), 3. location and access (3.1 locate sources-intellectually and physically, 3.2. find information within sources), 4) use of information (4.1 engage, 4.2 extract relevant information), 5. synthesis (5.1. organize from multiple sources, 5.2 present the information), 6. evaluation (6.1. judge the product-effectiveness, 6.2. judge the process- efficiency).

Besides these two tendencies and the models that represent them, there are also the models that major library related organizations have proposed. Such models are: ACLR’s (2001) Objectives for IL instruction: a model statement for academic librarians which is based on the Association’s (1987) Model statement of objectives for academic bibliographic instruction and according to its IL competency standards for higher education. The model describes 22 performance indicators (pic. 5) for higher education IL programs, organized under 5 standards.
Table 1: Coding list for ACRL IL objectives

<table>
<thead>
<tr>
<th>ACRL IL objective</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abilities defined</td>
<td>The information competent student determines the nature and extent of the information needed</td>
<td>The information competent student accesses needed information efficiently and effectively</td>
<td>The information competent student evaluates information and its sources critically and incorporates selected information into his or her knowledge base and value system</td>
<td>The information competent student individually or as a member of a group, uses information effectively to accomplish a specific purpose</td>
<td>The information competent student understands many of the economic, legal, and social issues surrounding the use of information and accesses and uses information ethically &amp; legally</td>
</tr>
<tr>
<td>Reference assistance offered that attempts to teach ACRL IL objectives</td>
<td>Need to conduct reference interviews</td>
<td>How to access databases remotely</td>
<td>Help evaluating the source on its own (e.g., look at indexes, abstracts, etc.)</td>
<td>Help with uploading coursework (such as Manni) on blackboard</td>
<td>Help with sending text from source material into student paper</td>
</tr>
</tbody>
</table>

**Pic. 5**

Under the same perspective, in 2004, the Council of Australian University Librarians (CAUL) with its Best practice characteristics for developing IL in Australian universities: a guideline proposed guidelines of best practices in designing IL programs. In 1999, SCONUL introduced Information skills model (pic. 6.) consisting of 7 pillars of actions for the design of IL programs.

**Pic. 6**

In 2005, the National Canadian Advising Association (NACADA) with the Academic advising program: CAS standards and guidelines, introduced a 16 desirable student learning and development outcomes model for students in higher education. As we can see, each model reflects the educational approach of the system under which it was developed. Every one of them, try to adequately cover the educational, social, economic and technological needs of the institution, and the society by extension, it will be applied to.

Besides the design model, an academic library should define two more parameters in creating an IL program: a) its instructional strategy, b) its instructional design. As instructional strategy we can define the procedure of the educational intervention for the development of skills. By instructional design, we
mean the procedure of designing the educational intervention, beginning with the adoption of a learning theory and finally, deciding on the instructional methods, the educational material types and the outcomes assessment methods (Carlson and Miller, 1991). Specifically, it consists of: a) defining the existing learner understanding state, b) the determination of the final educational outcomes and c) the development of an intervention by using specific means (educational material, tools etc) to assist the transition to the new-desired level of understanding. In fact, instructional strategy is considered to be the application of instructional theories, while the instructional design refers to, the educational content and the way the strategy will be applied in order to be more efficient in outcomes produced, and finally the way the educational material will be presented. Choosing a learning theory is a complex procedure and depends on the designers’ point of view about learning. There are three major school-theories the designers can apply: a) behaviourism, b) cognitivism and c) constructivism. Scientists expressed several points of views about the most adequate learning theory in higher education IL programs design (Pilcrot and Hiort af Ornas, sa; Bruce 1997, 1997a; Ryder, 2008). As previously stated, the design model a library will choose to use, is depended on its own dynamics. More specifically, on the intensions-goals of the program’s designer, its suitability in terms of labor allocation during its application and finally its ability to turn the students interest from the program itself to its goals.

An academic library case

The University of Macedonia Library, located in Thessaloniki, Greece, is a medium sized academic library. hosted by a medium sized public university. The University’s departments mainly cover scientific fields in Social Sciences. The library works as a grid of the central one, in Thessaloniki, with 2 branches in the cities of Naousa and Edessa and offers IL courses since 1998. After receiving funding from several EU programs, it developed a significant number of tools and services that made clear a revision of the whole program was necessary. In 2008, (March-May), a users’ satisfaction survey took place, including questions about the Library’s IL program. Four major findings concerning the program gave the IL Team a quite clear point about the extent of the revision needed. The survey revealed that 67,4% of the trained users were satisfied by its content, 70, 1% of the users hadn’t attended the program, among them 48,9% felt that it was not necessary for their studies to do so, and finally 71, 79% of the trained users, felt that the program should become a mandatory course of the curriculum. Taking into consideration these findings the Library’s IL team developed a new program. The main consideration of this new program was not only to describe the goals, the content and the means of its provision, but to introduce a whole new approach of it as a complete system. Following the parts of the instructional design and the instructional methodology are only presented. The rest of the scheme’s elements are still under process. The instructional design was based on Curzson and Lampert’s general design model while instructional strategy was based on the Big6 scheme, according to knowledge building and social constructivism theories. The following were created: a) a package of materials for face-to-face teaching containing: 1) the instructor’s manual, 2) a study guide and 3) supplements of the study guide and b) an electronic equivalent of the study guide within the Library’s learning platform, to be used either as tool to face-to-face classes or as stand alone educational material in distance learning IL courses. According to Big6 scheme, 6 educational units were created: 1) where am I, containing all the needed information, theory and activities related to the Library’s space, procedures, regulations, hours of service etc., 2) the resources, containing all the needed information, theory and activities related to the print and electronic collections, 3) research methodology, containing all the needed information, theory and activities related to how to design, perform and evaluate a research strategy, 4) the tools, containing all the needed information, theory and activities related to the Library’s print and electronic tools, 5) writing a paper, containing all the needed information, theory and activities related to paper writing from a term assignment up to a thesis and a scientific article, 6) assessment, containing activities that allow the students to evaluate what their learned during the program (pic. 7, 8). Each of the 6 units consists of a mix of theoretical parts, bibliography in the form of texts created by the instructional team as long as texts by scientists and researchers and finally by several sets of personal and group activities (case studies, research exercises, projects, questionnaires, gap filling exercises etc). Each unit also contains a part labelled “the librarian says:” which allows the instruction team to present theoretical information of more specific nature ex. in the resources unit at the point that scientific journals are discussed, there is a presentation of the peer-review process in order the students to learn how to publish a research article in a peer-reviewed journal. In the end of each unit, there is a self assessment part in order to help students assess what they have learned.
As stated above, each academic library is a unique case. Many parameters have to be considered during the design of an IL program and the decisions to be made reflect a lot of unique characteristics of the Library itself and its hosting institution as well. There are no right or wrong design models or decisions during this process, there are only decisions that describe specific needs and goals.
References

5. ALA (1999). Instruction in the use of libraries. *Policy manual* (Section 2, number 52.6) Available at: http://www.ala.org/ala/policymanual
69. UNESCO, the International Federation of Library Associations and Institutions (IFLA) and the National Forum on IL (NFIL) (2005). *Beacons Of The Information Society: The Alexandria Proclamation On IL And Lifelong Learning* Available at: http://www.ifla.org/III/wsis/BeaconInfSoc.html