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Dissertation:

**Providing Electronic Information Sources to
Undergraduate Students**

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Summary

The electronic information sources have become an integral part of the library services and they have a crucial role to play in the higher education. Undergraduate students depend their studies on electronic sources. However, electronic information sources cannot be used effectively without the necessary training by the library. The right instruction should be given to students on how each electronic source should be used. The evaluation of the information electronic sources through a survey on the students' opinion is of equal importance. The survey can help the library to find the real educational needs of the students as regards the electronic sources, to discover any possible weaknesses in the whole process and to improve its electronic services.

Introduction

There is no doubt that information technology has invaded our life and affected it in different ways. Over the course of the last decade computers have become a commonplace and they impinge on many facets of life. Academic libraries, as one of the main sources of information for years, have also been affected with important results. University libraries all over the world reconsider their role in order to keep pace with the new technology and the new needs of their users. Libraries using the new technology have converted a lot of their traditional information sources to electronic. These electronic sources can be a very useful and powerful information tools if they are provided to the students with the necessary education.

The ultimate aim of this dissertation is to discover which is the appropriate way for an academic library to provide electronic information sources, effectively, to its undergraduate students.

The electronic information services which an academic library offers is considered in this dissertation as a complicated procedure which involves: a) the provision of the necessary electronic information services to students, b) the education of the students on how to use effectively these sources, and c) the evaluation of both the use of the electronic sources and the education (and instruction) given to students. In order to find the appropriate way for an academic library to provide its electronic sources to students, we have to examine analytically and find how all the above factors should be realised.

Chapter 1 starts with some historical aspects which will help reader to understand how and why academic libraries have included the information electronic sources in their collections. This chapter continues by offering an analysis of the role of the most common electronic information sources in academic libraries describing their use and showing their importance.

In chapter 2 it is investigated why it is important for academic libraries to educate their students, and various educational methods are analysed. In the same chapter is also considered the new role that librarians should play in the environment of the electronic library.

Chapter 3 is dedicated on how the library should evaluate the electronic information sources as well as the educational methods and the instruction that it provides to the students. In this chapter it is described how an academic library can investigate its users real needs through a survey. The final answer is given at the end, in Chapter 4.

Primary and secondary data for this dissertation have been collected with the following methods:

1. Unstructured interviews. Discussion with six academic librarians who work in the electronic information sources department and with librarians who are responsible for educating students and giving them instruction. These librarians work for University and Collage libraries in Cyprus and Greece and they were chosen because they considered as very experienced and successful in their field. Through unstructured interviews the above librarians were asked to give their critical comments on the importance of electronic information sources and the education that libraries should provide to the users. All opinions, observations and suggestions were written down, evaluated and been processed properly in order to become parts of this dissertation.
2. Literature research. The literature research has been done in Thomas Parry Library (the Library of the University of Wales at Aberystwyth) and in the University of Cyprus Library. The literature research includes books and articles from the collection of these two libraries as well as electronic documents that have been gathered from the electronic sources of the above libraries and via the Internet. The materials that have been used in this work were carefully selected among others.

CHAPTER 1:

Electronic information sources

Historical aspects

The role of an academic library is to support the educational work and to fulfil all the educational and informative needs of the university community (students, academic and administrative staff). The information sources that academic library have collected through the centuries were mainly the printed material (books, periodicals, newspapers, maps, etc.). The development of the new information technology naturally affected the society and the way that people think and act. Undoubtedly information technology affected the higher education system and the academic library's operations and services. At the beginning, libraries included in their equipment a simple computer to use it as a database to keep their book records. This electronic database had replaced the traditional card catalogue. Gradually libraries were depending on the computer for all their operations (acquisitions, cataloguing, circulation, etc.).

Within the last few years a number of changes in the higher education sector are observed which have exerted pressure upon the traditional role of the academic library. The most remarkable ones are the following:

- Rapid growth in student number (without a relative increase in the number of library and information services staff).
- Growth in non-traditional students (e.g. mature part-time and distance learning students) who have different needs and expectations from the traditional eighteen-year-old school leaver.
- Inflation in the cost of printed materials.
- Growing number of academic publications.
- Rapid flow of ideas and information especially via the Internet.
- Falling library budgets as a percentage of the total institutional budget.
- Changes in teaching and learning methods, towards a greater emphasis on student centred learning.
- Information Technology (IT) developments.

The increase in the amount of electronic information sources available has been significant within the environment of academic libraries. As a result there is a demand for

information skills training for both staff and students. Additionally the emphasis in the academic libraries is moving to the networked information and the provision of access rather than holdings. Nowadays the academic libraries try to provide quality services to their students using the new technology. The electronic information sources are part of the library enhancement programmes.

At the beginning electronic information sources were simply pointers to print-based material (such as books and journals) and they were giving only bibliographical information to the students. Gradually, electronic information sources started also to provide students with full text information (through electronic articles and web pages via the Internet). Thus, electronic information sources became essential for the university studies and the academic library became electronic.

According to Lucy Tedd *“the phrase electronic library as well as others such as digital library, virtual library, networked library, library without walls and sometimes hybrid library, are often used to describe the developments in information and communication technologies (ICT) in information and library services.”*¹

In parallel with the development of the information technology and the fast spread of the Internet some completely new applications appeared. These new applications had mostly to do with search services and were the Online Public Catalogue (OPAC), the Compact Disk Read Only Memory (CD-ROM) and the search engines on the Internet.

The new information technology and especially the Internet have provided a great opportunity for improved global communication.

As the role of the information technology increased, it was necessary for libraries to act and communicate globally. Networking came to solve this problem. With their several computer systems libraries can be linked together in order to share their resources. At the same time different commercial organisations have developed high quality services offering to the libraries comprehensive library management systems, CD-ROMs and other powerful online services via the Internet.

Academic libraries, considering the cost of their subscriptions and the space problem that almost every library face, adopted a new policy. They started to cancel subscriptions of big multi-volume works (e.g. serials) and to buy new electronic services (electronic journals, online databases, etc.).

Of course, the increasing use of electronic information services in academic libraries has produced the need of new recourses.

The Joint Information Systems Committee of UK argues: *“At a time of rapid technological and educational change, and uncertainty as regards the economics of the information industry, there are great advantages in sector-wide initiatives which ensure that Higher Education loses no opportunity to take advantages of the extended range of electronic information resources which become available. Acting collectively, Higher Education can enjoy the benefits of lower costs, strategic partnerships and nationally-*

¹ Tedd, Lucy A. *The Electronic Library.* (3rd ed. Aberystwyth: Department of Information and Library Studies, University of Wales Aberystwyth, 1999), p.1.

focused external collaboration, while it can also experiment with innovative models of service delivery and charging.”¹

No academic library is considered as modern if it is not automated and if it does not provide some basic electronic information sources such as the OPAC, CD-ROMs and Internet to its students.

Electronic information sources in academic libraries

Electronic are the sources that provide information in an electronic and/or digital format. These sources are usually provided either on a CD-ROM or online (via a network or the Internet) and the user can use them through a Personal Computer (PC). Every modern academic library should have as a mission to ensure equity of access to information for all its users. Students must be able to use the library in order to get access to an ever-increasing amount of electronic sources.

Generally, there are three main kind of information that the electronic sources provide to users:

- Library catalogue information. This information can be gathered through the Online Access Public Catalogue (OPAC) and basically are bibliographical entries of books, journals and other library material. These entries include bibliographical references about each library holding and about its current status. After the user finds a record of item that interests him, he should go and get the actual item from the shelves of the library in order to gather physically the information resource.
- Bibliographical data. Online bibliographical databases (via the Internet or on CD-ROMs) include bibliographical references and citations to books, journal articles and other material. After the user finds a bibliographic record or citation that interests him, he should go to the library catalogue to search if the specific item exists in the collection of the library. If it does not exist, he can either order it by interlibrary loan (from another library) or search for it in a full text database (in the case of a journal article, for example).
- Full-text documents. The full text of a document can be gathered through an online database via the Internet, through a web page on the Internet, or through a CD-ROM database. These documents could be newspaper articles, journal articles, government publications, a specific chapter of a book or even (in some special databases) the whole book in electronic format. The electronic full text document may also includes pictures, charts, diagrams or photos and the user can

¹ *An Integrated information Environment for Higher Education: Developing the Distributed, National Electronic Resource (DNER)*. Hp. 2000. Online. Joint Information Systems Committee. Available: http://www.jisc.ac.uk/cei/dner_colpol.html. 12 Aug. 2001.

read the electronic document from the screen of his PC or print and read it in a paper format.

The most common electronic information sources that undergraduate students can find and use at the university libraries are:

1. Online Public Access Catalogue (OPAC). The OPAC is the library's computerised catalogue and is available to anyone using the library through computer terminals, which are usually installed for this purpose in the library building. Access to online catalogue may also be provided through a web-OPAC allowing people outside of the university campus (or even from another country) to have access to the catalogue of the library via the Internet. OPAC allows the user to search for a specific item or to search for information about a subject. Through the OPAC students can make searches with the author's name, the title of a book, the subject, with keywords or with a combination of all the above. The OPAC shows if a specific book exists in the library and gives information about its status at the specific time (if the book is on the shelves, or on loan, or if it is reserved by someone else, etc.). Some OPACs also allow the students to check their own account, to reserve a book, to renew their holdings and to communicate with library staff (by sending messages).

There are different kinds of OPACs that someone can find in an academic library with a variety of usages and abilities. An OPAC may operate in a Disk Operating System (DOS) environment, it may be a window based OPAC (operating in a widows environment), or it may be a web-OPAC (operating in the web via the Internet). A new trend that has been shown up from some libraries is to develop their OPAC in to a virtual library by providing digitalised documents (except from the bibliographical records) though it.

2. Compact Disk Read Only Memory (CD-ROM). Most of the university libraries include multimedia and databases on CD-ROMs in their collections. Some CD-ROMs are very attractive to the students because they can combine the information they provide with voice, picture and movement. In the indexes of a CD-ROM database someone can easily and quickly find the information he is looking for among a wide range of data and information. The above characteristics have made the CD-ROM very popular to the users. Most libraries use CD-ROM towers (servers that give the ability to a number of students to use the same CD-ROM at the same time) or they network their CD-ROMs in order to face the increased demand from the users.

Some of the most common CD-ROMs that someone can find in an academic library are the following:

- ABI/Inform
- Econlit
- ERIC (Educational Resource Information Centre) CD-ROM
- Humanities Index
- The Philosophers Index
- Bookfind

3. Online databases via the Internet. Most of the university libraries are subscribers to online databases via the Internet. These databases allow students the quick and easy search and the retrieval of bibliographic results, abstracts and full text articles. Most of these databases can be accessed from the university campus through the Internet Protocol (IP) addresses of the university, or through a login and a password that the library provides to the users in special occasions.

Some examples of online databases via the Internet that academic libraries provide to students are the following:

- Bath Information and Data Services (BIDS): <http://www.bids.ac.uk>
- The Dialog Corporation: <http://www.dialog.com>
- OCLC FirstSearch: <http://www.oclc.org>
- Questel – ORBIT: <http://www.questel.orbit.com>
- LEXIS-NEXIS: <http://www.lexis-nexis.com>
- SearchBank (by InfoTarc): <http://infotrac.galegroup.com/>

4. Electronic journals and electronic books. The journals and the books that provide their full text documents in electronic format are called electronic. These documents can be accessed from a PC. Lately, a lot of journals use to be issued in electronic format. The trend for the biggest publishing organisations is to provide their journals (and) electronically. Some of the traditional journals, although they continue to be issued in a paper format, they also provide their articles in electronic format. Additionally, new electronic journals, magazines and newspapers appear every day in the Internet. Some of them give a free access where some others need a subscription. Electronic publications can add more value to a publication by including colour, high quality graphics, searching facilities, multimedia presentations and direct links to other related electronic material.

The issue is totally different from the electronic books. The most databases of electronic books that someone can find in the Internet include old or rare books and other publications, which are not affected by the copyright law. The digitisation of a book can be used for other special purposes as well. Blind and visually handicapped readers, for example, can “read” electronic text either vocally (with the help of a special software) or by touch (with the help of a Braille display especially designed for this purpose). The digitisation of a book or a manuscript can also protect it from a heavy use, especially if it is unique or rare. The electronic text of the book or the manuscript can be provided to users either online through the Internet or on a CD-ROM.

A small sample of electronic journals is the following:

- Academic Psychiatry: <http://ap.psychiatryonline.org/>
- Educational Studies in Mathematics:
<http://www.wkap.nl/journalhome.htm/0013-1954>
- Food Control: <http://www.elsevier.nl/locate/issn/09567135>
- IFLA Journal: <http://www.ifla.org/V/iflaj/index.htm>

- Library Philosophy and Practice:
<http://www.elsevier.nl/locate/issn/09567135>

A few samples of electronic book databases are:

- Antique Books – Library: <http://www.antiquebooks.net/library.html>
- Books in the Victorian Web:
<http://landow.stg.brown.edu/victorian/misc/books.html>
- The Complete Works of William Shakespeare:
<http://tech-two.mit.edu/Shakespeare/works.html>
- The On-Line Books Page: <http://www.digital.library.upenn.edu/books/>
- Virtual library for Library and Drama: <http://vl-theatre.com/list4.shtml>
- WWW Virtual Library: <http://vlib.org>

5. Internet. A number of different kinds of facilities and information services are offered over the Internet. Electronic mail (e-mail), telnet protocol, File Transfer Protocol (FTP), Hyper Text Markup Language (HTML) and the World Wide Web (WWW) are only some of the tools that have been developed in the Internet to help the user to find, transmit and retrieve information. The Internet through WWW and its search engines became a powerful searching tool where someone can find almost everything. However, the explosion of information in the Internet and the increasing number of web pages create a chaotic situation.

There is an unaccounted number of web pages that someone can access via the Internet covering all subjects and topics.

Some search engines are specialised in only one topic where some others are for a general search.

Some of the most famous general search engines in the Internet are the following:

- o Alta Vista: <http://www.altavista.digital.com>
- o Excite: <http://www.excite.com>
- o LookSmart: <http://www.looksmart.com>
- o Lycos: <http://www.lycos.com>
- o Yahoo!: <http://www.yahoo.com>

Examples of web pages specialised on one topic are:

- o Libdex: <http://www.libdex.com/> (A library directory to 17.000 libraries and OPACs).
- o In.gr: <http://www.in.gr> (covering all Greek web pages and every web page about Greece).
- o Sports.Com: <http://www.sport.com> (a sport web page).

Other informative and useful web pages on the Internet are:

- o Encyclopaedia Britannica: <http://www.britanica.com>
- o English language dictionary:
<http://education.yahoo.com/reference/dictionary/index.html>

Furthermore, almost every university library has its own web page with information, guidance, instructions and useful links to the students e.g.:

- o Thomas Parry Library (University of Wales, Aberystwyth):
<http://www.inf.aber.ac.uk/tpl/>
- o Oxford University Libraries: <http://www.lib.ox.ac.uk/>
- o Harvard University Libraries: <http://lib.harvard.edu/libraries>

- University of Cyprus Library: <http://www.ucy.ac.cy/library>

*“In summary, a vast number of electronic information resources are available – some highly structured and compiled by professionals and others unstructured and made available by anyone. The ways of accessing such resources can be either via an online search service (which usually costs money), via an OPAC developed by a library or information service (which is usually free), via a CD-ROM database (for which an annual licence fee will probably need to be paid), or via the Internet (which may or may not be free).”*¹

Electronic sources became essential for the university studies and are very popular to most of the students because they can provide a number of advantages over traditional print based sources.

Advantages of using the electronic information sources

According to Brophy (1993)² some of the advantages of using the electronic information sources are the following: the information needed can be delivered from the most appropriate source to the user; the user can re-specify his or her needs dynamically; the information is obtained when it is wanted, so becomes "just in time" rather than "just in case"; the user selects only the information needed to answer the specific question and, finally, the information is stored only if the user wishes, and very often by the user, not the library.

It is easy for someone to understand the importance and the usage of electronic sources, especially if he adds to the above the follow advantages:

- ✓ The speed with which the user can make a search.
- ✓ The ability of the user to make complicated searches using a combination of keywords.
- ✓ The possibility of searching multiple files at one time.
- ✓ Electronic resources can be printed and searches saved to be repeated at a later date.
- ✓ They are updated more often than printed tools.

¹ Large, Andrew, Lucy A. Tedd and R.J. Hartley. *Information Seeking in the Online Age*. (London: Bowker Saur, 1999), p.69.

² Brophy, P. (1993) “Networking in British academic libraries”. *British Journal of Academic Librarianship*, 8.1, (1993): 50-51.

- ✓ They are available from outside the library by dial-up access twenty-four hours per day.

However, students should notice that electronic information sources are not the panacea remedy for all their problems and their information needs.

Disadvantages of using the electronic information sources

Electronic information sources (as every information source) have also their disadvantages. The main disadvantages of using an electronic information source may be:

- ✗ The cost. Although the cost of electronic sources is considered as one of their advantages against printed material, it also may be a disadvantage depending on the circumstances and the pattern of use. Some databases for example charge their users according to the time of use or according to the number of the searches they do. For heavy users of such databases, buying a printed source or a CD-ROM is bound to be cheaper.
- ✗ Special equipment and access to communication networks, electricity supply, etc. are necessary for the online searching through databases.
- ✗ Electronic information sources use a wide variety of systems and software for their operation, therefore it is difficult for students to learn the use and the special characteristics of all the electronic sources provided by the library.
- ✗ There is a need of training and practice to students in order to use electronic information sources effectively.

It is essential for students to be aware that electronic and print-based sources complement each other and so it will be for many years. Especially the older material is very difficult to be found in electronic format apart from some exceptions, such as rare or unique books and manuscripts.

Essential elements for the use of the electronic information sources

The following elements are essential for the students in order to use all the above online electronic information sources:

- Student workstation. The students should have access to a PC terminal with the appropriate software, a connection to the Internet and a printer in order to be able to use the electronic sources and retrieve information. The workstation may be provided by the library (in the library building or in the university campus) or it may belong to an individual (usually students have limited access from a distance access point). The academic library should provide sufficient number of PCs from

where students can use the electronic sources (especially at peak times). If students go to the library to use an electronic source and they don't find a free PC, they may be disappointed and may not try to use the same source some other time.

- The electronic information source. The library must have the specific electronic source (purchase it or pay subscription for it).
- Information skills. In order to be able to use an electronic information source, students should have some basic information skills and instruction on how to use the specific source.

CHAPTER 2:

Educating the students on how to use effectively the electronic information sources of the library

The importance of educating the library users

Every individual, and especially students through their studies, has today an increasing need to be able to find information out. Nowadays a lot of information is available to students and their studies and personal lives depend on their ability to handle information. The fact that electronic information sources give to students the ability to have access to a variety of information more easily and more quickly makes these sources essential for the students and for their studies.

According to librarians who have worked on the electronic information services department of an academic library, there is a disproportion in the information knowledge that students have. *“There are some first year students that rush up on the first day asking where they can find the e-mails, the BIDS and the e-journals whereas some others don't have any idea of how to turn the PC on.”* (Academic librarian).

Some students appear to have great expectations about the capability of the electronic sources and they are clearly unaware of the limitations and uses of many of them.

It is obvious that students, in order to be able to use effectively these sources, should take a basic training and they should have (at least at the first stage) the library support.

Students should not underestimate the skills required to search electronic sources.

*“The skills required to maximise the potential of electronic resources are much greater than those required for searching printed sources. These skills include a knowledge of the structure of the database and the instructions which must be input into the computer by the searcher, as well as an understanding of the ways in which the instructions are linked with one another.”*¹

As Brophy argues, libraries should *“reach a position where the acquisition of information skills is acknowledged as one of the key learning objectives for every student entering a*

¹ Ray, Kathryn and Joan Day. “Student attitudes towards electronic information resources”. *Information Research*. 4.2 (1998): 57 pars. Online. Available: <http://informationr.net/ir/4-2/paper54.html>. 13 Aug. 2001, par. 9.

university, so that no student leaves without being fully equipped to cope with the information intensive world - the information society - as an end-user."¹

Sometimes users don't know what exactly an electronic source can provide to them, how it can help them in their studies or they do not know how to get access and use it.

*"As librarians, we certainly understand why information literacy is essential; however, we face a number of challenges in sharing that understanding. First, we must change the misconception believed by students (and sometimes faculty) that knowing how to use a computer is the same as knowing how to find information. Computer literacy is only one of the many skills needed to access and retrieve information. Second, we must stress the importance of evaluating the retrieved information, and not just the process of knowing how to use indexes, online catalogues, or CD-ROM databases."*²

Libraries, in order to keep pace with new technology and to help their users to retrieve more information more easily, provide new electronic sources that are getting more complicated every day. The students who want to use the electronic sources of the library should not only know the meaning of terms such as Telnet, FTP, HTML, IP address, Acrobat Reader, etc., but they must also know how to work and handle them.

It is responsibility of the Library to let users know about its electronic services and to give them some basic instruction on how to use them. Students who do not know how to use a service will have a serious disadvantage in their studies against the others.

Information literacy and the ability to seek effectively the electronic information sources have become crucial in the information age. Academic libraries have an important role to play in equipping students with the ability to access and use information.

According to LaGuardia *"teaching students to use electronic resources is a powerful hook into all kinds of library research."*³

There are some groups of undergraduate students that have special educational needs and the library should treat them in a special way. Distance learning students, for example, whose studies depend a lot on electronic information sources and Internet, have the need to use these sources from their homes. They may have to follow a different approach (e.g. the use of password to gain access instead of the I.P. address, etc.). Disabled students, such as blinds, have also different needs. Library should consider these groups of students (if they exist at the university) and design special instructions for them.

¹ Brophy, P. (1993) "Networking in British academic libraries". *British Journal of Academic Librarianship*, 8.1, (1993): 55.

² Young, Rosemary M. and Stephen Harmon. *Working with Faculty to Design Undergraduate Information Literacy Programs: A How-To-Do-It Manual for Librarians*. (New York: Neal-Schuman, 1999), p. 4

³ LaGuardia, Chely , et al. *Teaching the New Library: A How-To-Do-It Manual*. (New York: Neal-Schuman, 1996), p.20

Aims and objectives of the education

The academic library is the responsible organisation to educate the undergraduate students on how to use effectively the electronic sources that provides to them. The aims of the education should be:

- a) To inform students about the existence of the library electronic information sources. This should be the first step of the education. To let students know which electronic sources does the library provide to them, from where and how they can gain access to them.
- b) To explain students what they can expect from each electronic information source and how this source can help them in their studies. It is necessary to explain to the students how important these electronic sources are for their studies and how useful they can be to them.
- c) To give students the necessary skills in order to use each electronic source effectively and efficiently. It is not enough to show users how to turn on the PC and how to get access in each electronic source. It is equally important to teach them the necessary search strategies and techniques that will enable them to retrieve the appropriate information. A student uses effectively and efficiently the electronic source when he can find what he is looking for as quickly as possible, with the minimum effort and when he knows how to retrieve it.
- d) To give students the skills to understand and utilise the information they gather. It is important for students to be able to distinguish what is really important for them among a vast of information.

Analytically, the objectives of the students' education on how to use each electronic source in an academic library should be:

- 1) OPAC. After the training of the students on how to use effectively the OPAC, they shall be able to: a) recognise and use the Boolean operators (AND, OR, NOT) in order to make a combination of searches b) recognise all the information that is given in the bibliographical entry about the specific item c) recognise the status of the item and where they can go and get it d) make a reservation of a book and renew their holdings by their own and e) access the OPAC via the Internet.
In the education session students should make a practical exercise by making searches and go to the shelves to retrieve the items they have found. They can also try to make a reservation and to renew a book from their account during this session.
- 2) CD-ROMs. The training of the students on how to use the CD-ROMs should aim to teach them how to: a) get access to a CD-ROM even if it is available at a stand-alone workstation or if it is in a CD tower or a network server b) use Boolean operators

(AND, OR, NOT) in constructing a search and c) retrieve the information they have found.

In the education session students could use a specific CD-ROM database (from a topic related to their studies), make a search and retrieve information from it.

- 3) Online databases via the Internet. Students should learn how to: a) get access to the Internet and find the necessary database b) recognise which is the most appropriate database to search in according to their needs c) search online databases using the Boolean operators (AND, OR, NOT) and d) retrieve the necessary information.

In the education session, students should be connected to the Internet and access a specific online database (of their interest) to see how it works. They could make a search and retrieve information from it.

- 4) Electronic journals and electronic books. Students should be trained on how to: a) get access to these electronic sources b) search effectively in order to find what they are looking for and c) retrieve the information they need.

In the education session students could access an electronic journal and learn about document delivery services, the FTP and the printing facilities of the library. They can also access an electronic book database in order to get an idea of what it offers and how it works.

- 5) Internet. Users should be trained on how to: a) get access to the Internet and to the search engines b) choose the appropriate search engine to search in and how to search in the right way by using the subject trees that most search engines provide c) how to select, evaluate and retrieve what they really need among a mass of trash data and information. *“Students who turn to the Internet for research usually head straight for the major search engines. That’s too bad, because there are important differences among search tools in terms of the scope and quality of information.”*¹ The researchers have to pass a lot of “trashes” before they find what they want. Besides they should always have in mind that *“Internet users can access a vast array of information and statistics, but much of the data can often be found with less effort and cost at the library or through other conventional sources.”*²

In the education session students could access an electronic information resource on the web, use the e-mail and the FTP in order to transfer and receive information.

Educational methods

Most academic libraries organise instruction programmes for their first year students at the beginning of each academic year. The programmes usually begin with a general tour

¹ Kuntz, Jerry. “Teach and They Shall Find: Teaching Students Successful Online Searching”. *School Library Journal*. 47.1 (2001): 54

² Caragata, Warren. “Information Overload: The Internet is Fun but is it Useful?” *Maclean’s*. 107.38 (1994): 60

in the library building where students get a comprehensive idea of what the library is like and what services is offering to them.

Most specific instruction programmes are organised to show to the first year students how to use the information services and sources of the library.

The major formats that academic libraries use to educate their undergraduate students on how to use the electronic sources are the following:

- Printed guides. This is a very popular method among academic libraries. In most universities, especially the big ones, it is very difficult to demonstrate to all undergraduate students how the electronic services work. With the printed guide library can inform massively all its students about the electronic services. Usually libraries give printed guides to all first year students where it is written in details what each electronic source offers and step-by-step how it works. Additionally, the printed guides can easily be updated and be available in a visible place in the library for any student or visitor. Library should promote all its electronic information sources (especially the less popular ones) through printed guides, additional training and online help in order to encourage students to see their potentials. If the printed guides are attractive (both in the appearance and in their contents) and clear, they can be a useful tool for promoting and advertising the library and its specific services.
- One-to-one instruction. This method is very familiar to most students and librarians. Most of the times there is at least one available librarian who can give his help to any student using the electronic sources. This is probably the best way to give instruction to a student. It is a direct method of teaching on the time and place where the student really needs to learn how a source is working. However, this method can be extremely time consuming and it is impossible to be applied to all undergraduate students. This is a very good method, when it is applied in special cases and it is very effective in order to solve particular problems and answer to specific questions that students may have when they are using the electronic resources.
- Lectures and courses. *“The lecture, the most traditional way of presenting information, is a popular format and a good vehicle for conveying knowledge to users.”*¹ Tutorials, seminars and courses are also popular to students and they can be extremely interesting for them especially if they involve videotapes, slides, transparencies, presentation software (such as PowerPoint) or on-line presentation of the electronic information sources. Computer workstations where students can come in touch with electronic information sources and apply what they have learned during the course will be very helpful. Instructions in this format can be given to all first year students in groups. Courses or lectures should be well organised and their duration should depend on the number of the electronic sources that the tutor have to teach. This kind of training requires expert librarians

¹ Roberts, Anne F. and Susan G. Blandy. *Library Instruction for Librarians*. (2nd rev. ed. Englewood, Colorado: Libraries Unlimited, 1989), p. 64.

with special educational and communicational skills. Problem may appear again if the number of the students is large in each session. In some libraries that use this method the lectures or the courses are not obligated and a lot of students do not attend them. Libraries should give a motivation to all first year students to attend these lectures. Some universities give credits to students who pass a simple test after their participation in such library courses and some other academic libraries give to students the library card (and the right to use the library facilities) only if they attend the courses.

- Online instruction. A lot of electronic sources (e.g. most of the OPACs and most of the online databases) provide to the users online instruction and on line help. Additionally, some of the academic libraries provide online instruction through their web pages and answer online the students' questions via the e-mail. Lately some independent web pages have appeared on the Internet that aim to help users to search effectively the electronic sources and especially the Internet. An example of such a web page is "The Cyberlibrarians' Rest Stop" (<http://www.angelfire.com/in/virtuallibrarian>). This web page "*contains helpful tools for the web searcher, research on virtual library collections, web searching methodologies and a collection of resources for keeping current with Web-Based resources.*"¹

All the above educational methods have their advantages and strong points where at the same time have some weaknesses. A successful education should include a combination of the above methods (printed guides, lectures, one to one instruction and support by librarians and online help) according to the ability of the library and to the real educational needs of the students. The latter can be found after an objective evaluation of the education and the instruction given from the library (see the chapter 3).

Observations and suggestions from librarians.

Librarians with experiences in running education and training programmes for undergraduate students outline through the unstructured questionnaires interesting observations. These observations and suggestions were resumed and are presented below:

- ✓ The level of the training and the aims of the course should be defined by the teaching librarian.
- ✓ Structure sessions should obtain an appropriate balance between lectures, practical exercises, self-help workbooks, discussions, etc.
- ✓ The appropriate teaching aids (overhead transparencies, live demonstrations, prepared exercises, PowerPoint demonstrations, videos, computer aided instruction, etc.) should be used.

¹ *The Cyberlibrarians' Rest Room*. Hp. 2000. Online. Angela Elkordy. Available: <http://www.angelfire.com/in/virtuallibrarian>. 13 Aug. 2001, par. 1.

- ✓ The training should be planned at an early stage and integrated into the curriculum.
- ✓ During the education courses library should ensure that information skills are pitched at a level, which is appropriate to the individual needs of the undergraduate student. The training should include subject-based assignments. It is better for the examples to be given on subjects that students are familiar with (according to their particular topic of study).
- ✓ Emphasis should be given on hands-on and on student-centred experience.
- ✓ Feedback and review should be part of the process.
- ✓ The sessions should be part of the student's formal timetables.
- ✓ The appropriate course documentation should be developed, whether printed or online (or in both formats).
- ✓ The motivation of the students to join the organised trainings of the library is very important. The academic staff can play a crucial role in motivation by explaining to the students the importance of the electronic information sources for their studies. It is very important for the academic staff to be aware of the electronic information services that the library provides. If the members of the academic staff know which sources are beneficial for their course and therefore for their students, they will exhort students to use the electronic information sources of the library and take more seriously the education. There are also some examples of teachers who accompany their students to such educational programmes and consider them as a part of their course.

All the above recommended approaches might support the academic library to provide electronic information sources to undergraduate students more effectively.

The role of the librarian

In the information age, the university library became less a physical place and more an organization of people who gather, organise and distribute information electronically. The increasing importance of educating the users has brought change on the traditional role of the librarian. Librarians have moved out of their traditional role as custodians of information to become primary instructors of research and critical thinking skills. They have mutated to system designers, information consultants, educators, web page designers and Internet researchers. With the use of new technology and Internet, librarians have become information professionals and they are responsible to evaluate, analyse and organise the information in a way that users would access and retrieve it

effectively. Librarians have the duty to collect and provide information from different kind of sources.

*“Traditionally, reference services focused on helping faculty and students locate material within the four walls of the home library. With the advent of the electronic library, librarians must now teach not only these home resources, but also point to the existence of, and means to access, the vast aggregate of global material. They must indicate local, national and international catalogues, an immense world of government and business resources, local and distant CD-ROM bibliographic databases, an abundance of full-text databases, the increasingly important realm of electronic journals, and up-to-the-minute news of local and world events on the Internet.”*¹

Library staff is responsible both for the management of the electronic sources as well as for the support and education of the students. In order to do their job successfully librarians must have the necessary knowledge and experience. It is important for the library manager to develop a culture in which the process of continues learning and an acceptance of change by staff is the norm. There is a need for the library staff to be adapted to the new environment. Library staff should undertake more training themselves and try to get more involved with the electronic sources of the library, especially the new ones. Any librarian, who wants to be effective in his job, must be up to date. He must watch carefully the changes in the profession and in the society and try to be informed about the abilities that new technology offers. The continuing education with trainings, conferences and new readings is essential for the academic librarian to stay “alive” and useful in the world of information and library services.

¹ Rapple, Brendan A. “The librarian as teacher in the networked environment.” *College Teaching* 45:3 (1997): p.114.

CHAPTER 3:

Evaluating the use of electronic information sources and the education given to the users

Why the evaluation is important

The new technology is developed every day and this affects both the electronic services that every academic library offers to the students and the educational needs of the students. It is wise for every academic library to make a survey in order to discover how effectively the electronic information sources are used and what the real educational needs of the students are. Evaluation should also be done to the instruction that is provided to the students on how to use the electronic information sources in order to indicate any possible weaknesses.

It is very important for the library to see the situation firstly through the eyes of the student – user and then of the information professional. *“The views of users should be a vital form of analysis into the effectiveness of these sources, as well as enabling the varying needs of students to be met, and monitored.”*¹

Academic library should be able to discover and understand the real educational needs of the students. This can be obtained with the frequent use of questionnaires and interviews

¹ Ray, Kathryn and Joan Day. “Student attitudes towards electronic information resources”. *Information Research*. 4.2 (1998): 57 pars. Online. Available: <http://informationr.net/ir/4-2/paper54.html>. 13 Aug. 2001, par 11.

to the students. Only after such an evaluation the library will have the ability to design and develop appropriately its electronic information services

Aims and objectives of the evaluation

The objectives of such an evaluation should be:

- To count the use of each electronic information source separately and find out which sources are the most popular to the students and if a specific source needs more promotion. This is necessary for the library in order to see if its sources (for most of which library may pay a subscription) are useful and necessary to undergraduate students. This will enable the library to reconsider if an electronic information source should be provided to students or not.
- To discover why a specific electronic information source is not so popular to the students. The survey, for example, may indicate that an electronic source needs better promotion or that its interface is not user friendly and this avoids students from using it. It may also show that the content of a source is not what students have expected or that the library hasn't given the appropriate instruction to the students.
- To find out if the education given to the students is the appropriate, if the students are pleased with it or if they think that something in the educational process should be changed. The real educational needs of the students as regards the electronic information sources can only be found after such a survey by the library.

The most important aim of the library should be to record the general opinion that students have about the electronic services of the library (to find out if they are satisfied with the electronic information sources that library offers to them and how do they feel about the instruction and the education they get). The suggestions of the students should be written down and be considered as very important for the library's future decision making on electronic services.

Although a survey may not always discover how exactly students respond to a particular electronic information service in the library, it can surely provide valuable ideas for the improvement of it.

Research methodology

Information about the undergraduate students' knowledge on the electronic sources, about the time they spend using them, as well as about the effectiveness of the education and instruction given to the students can be collected through the following methods:

1. Questionnaires to the students. A number of anonymous questionnaires could be given to undergraduate students randomly. Since the anonymous questionnaire is a more personal way for students to express themselves, it is estimated that through questionnaires library can collect more personal and objective information. The students should complete the questionnaire in the library, in the presence of a librarian who can give them any needed explanations about the questions. After that, students should enclose the questionnaire in an envelope and put it in a box.
2. Opinion leader interviews. Interviews could be done to a guided audience of undergraduate students that should include both males and females and should contain a representative number of all the departments of the university and of all the academic years of undergraduate students. If the university supports alternative ways of education (e.g. part time or distance learning education) library should include a representative number of these undergraduate students in the survey. It will be better if the interviews are recorded on tapes and written down later. Interviews will give to the librarians the opportunity to contact with students in a direct way through the conversation and this may help them to learn something more about how students feel and act. The interviews can be taken in the Library building by appointment.

The questionnaires and the interviews, in order to archive the objectives of the evaluation, could include guided questions asking information about the following¹:

- a) If the students know the existence of all the electronic information sources of the library.
- b) If they know how to use them.
- c) If they find it easy to use these sources and if they believe that electronic sources are useful for their studies.
- d) Which electronic sources use most, which they avoid and why.
- e) If they have joined the basic training on how to use the electronic sources of the library (in case that the basic training is not obligate).
- f) If students are generally satisfied with the instruction that the library gives them on how to use the electronic sources.
- g) If they think that the instruction must be improved in any way and how.
- h) If they think that more training on how to use these sources is essential.
- i) If they think that more/better instruction must be held near the workstations where students use the electronic sources.

¹ Useful information on how to construct a questionnaire for such a purpose someone can find in: Shonrock, Diana D., ed. *Evaluating Library Instruction: Sample Questions, Forms and Strategies for Practical Use*. Chicago: American Library Association, 1996.

- j) If the on-line instruction and the on-line help (if there exists any) for the electronic services are clear and helpful for them.
- k) If they are satisfied with the help and the support they get from the library staff when they ask for it.
- l) Finally undergraduate students should be asked to give their own suggestions and critical comments.

A pilot stage and an evaluation of the questions should be done before the final design of the questionnaires and the interviews.

3. Observation and experience. The observation and the experience of the library staff that works at the information desk should be considered as very important for such a research. The library staff can give information on how often students have difficulties during the use of the electronic sources, how often they get stuck and ask for help and how often they can find what they seek for with out any problem. The most common problems that undergraduate students face when they use the electronic information sources of the library and the most frequently asked questions to librarians can lead the library to very useful conclusions. For the collection of this information all the members of the staff who work in the information desk should be asked if they have anything to report on this matter. The members of the library staff can provide their observation through open conversation or through a guided questionnaire especially designed for them.
4. Electronic statistical data. A lot of OPACs, online electronic databases and electronic journals provide useful statistical data for the use of the specific source, the way students use it, how and what they search and how many of these searches have been successful. The right process of these data will help the library to draw useful conclusions.

The evaluation on the use of the electronic information sources and on the satisfaction of the students will help the library to find any possible gaps in its electronic information services, to improve them and to keep its users satisfied. The evaluation should be repeated after a period of time, in order to show any improvements or changes that have been done by the library. The whole survey should also be evaluated in order to be improved and become as objective as possible.

CHAPTER 4:

How an academic library should provide the electronic information sources to undergraduate students

Considering the findings from all the above chapters, we should mark that the most appropriate way for an academic library to provide effectively its electronic information sources to the students is by follow successfully the above steps:

- 1) Find the most appropriate electronic information sources for the educational needs of the undergraduate students according to the university curriculum.
- 2) Provide the necessary equipment and access to electronic sources for all the undergraduate students of the university.
- 3) Provide to students the most appropriate educational method (or the most appropriate combination of methods) in order to educate them effectively.
- 4) Evaluate the electronic sources and the education providing to students.

The information age has transformed the way in which people live and offers new opportunities to the academic libraries for serving their users. Electronic information sources can be a powerful tool for all the members of the academic community if they learn to use it effectively. It is obvious that electronic sources such as OPAC, online databases, electronic documents and Internet are essential every student or researcher.

Especially for the undergraduate students new horizons will be developed on the way they search and retrieve information if they only get the necessary information skills. *“This is no to argue that information seeking requires knowledge and skills only painfully*

won after years of concentrated study. But as with many tasks a little advice backed up with well chosen examples can save a lot of time and trouble.”¹

The skills that undergraduate students will get on how to search effectively through the electronic sources and on how to retrieve useful information are transferable. These skills will help students to cope in our information-based society, later in their life if they decide to continue their studies, in their future job and in their daily life.

The objective of every academic library should be the provision of the most appropriate information source to the students each time they need it. There is no doubt that the provision of the electronic information sources to undergraduate students is an imperative but complex library operation. This can be done effectively only if it is accompanied with the right training and the right support from the library. The evaluation of all the above (provision of information, training programmes and support by library) and the ability of the library to be adapted to the new IT developments is crucial especially in our changing world.

¹ Large, Andrew, Lucy A. Tedd and R.J. Hartley. *Information Seeking in the Online Age*. London: (Bowker Saur, 1999), p. viii.

List of Acronyms

BIDS	Bath Information and Data Services
CD-ROM	Compact Disk Read Only Memory
DOS	Disk Operating System
E-journals	Electronic journals
E-mail	Electronic mail
E-sources	Electronic sources
ERIC	Educational Resource Information Centre
FTP	File Transfer Protocol
HTML	Hyper Text Markup Language
Http	Hyper Text Transfer Protocol
ICT	Information and Communication Technology
IFLA	International Federation of Library Association
IP address	Internet Protocol address
IT	Information Technology
OCLC	Online Computer Library Center
OPAC	Online Public Access Catalogue
PC	Personal Computer
WWW	World Wide Web

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