Information Literacy Service: SWOT Analysis

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Abstract

Purpose - Information Literacy (IL) has nowadays a primary and substantial role within Academic Libraries worldwide. Aiming to respond to the new trends of education that the information society calls for, the Central Library of the National Technical University of Athens (NTUA) has developed the Service "Information Literacy Workshops". The purpose of this paper [1] is to describe the development of an Information Literacy (IL) Service in the context of a Hellenic Academic Library, by discussing the Strengths, Weaknesses, Opportunities and Threats that this project's team encountered.

Design/methodology/approach – Five IL workshop cycles took place in the NTUA Central Library. The first cycle was addressed to the NTUA library staff, endeavoring to establish a "learning organization" culture; three cycles were addressed to the NTUA graduate students and one cycle to post-graduate students. Each IL workshop cycle was designed, implemented and evaluated after consideration, study and adaptation of the international IL standards and strategies, as well as of four learning theories (Behaviorism, Social/Cognitive Behaviorism, Cognitivism and Constructivism) and by utilizing services and tools developed in the past by HEAL-Link within the framework of the Program "Digital Convergence".

Findings - The library, as part of an interconnected academic ecosystem, and especially because the volume of data available on the Internet is shockingly high and constantly increasing, should evolve and enhance its viability mainly through its intra and extra institutional collaborations and through its active involvement in the curriculum design with a vision to establish an "information literacy" culture.

Originality/value – This paper enhances academic librarians' understanding of an IL Service's development in three ways: firstly, by narrating a real story with failures and successes and thus offering the chance to reflect upon them; secondly, by deepening in this project's design, implementation and evaluation; thirdly, by proposing better practices that could urge Hellenic Academic Libraries to create from scratch their own IL Service or to develop their existed one further.

Index Terms — **Information Literacy, Learning Theories, SWOT Analysis, Learning Organization, Hellenic Academic Libraries, Scalability and Sustainability of Services & Tools of Previous Programming Periods in Greece.**

I. INTRODUCTION

In recent decades, academic libraries in many countries around the world, have been implementing Information Literacy (IL) standards and have been following the IL strategies devised by their national information and libraries associations and by the international ones, such as IFLA and UNESCO, as well as the predominant ALA, ACRL and SCONUL, with the vision to transform their universities into "information literate" organizations. The main purpose of the libraries is for all members of their institution - teachers, researchers, students and employees - to acquire and apply the skills defined by the IL concept, which are nonetheless transferable and in many areas of the socio-economic and personal life. Additionally, specific objectives are to strategically design, develop, evaluate, and integrate IL specialized courses into academic curricula and establish them as basic graduation requirements **[1]**.

The NTUA Central Library had attempted to tune in to this same trend, by discussing probationary IL actions, as early as 2008. In order to explore whether it could create an integrated IL Service, it carried out two relevant surveys **[2], [3]**. The surveys concluded that the vast majority of faculty members and students of the NTUA, used highly electronic resources of information and hardly any of the library's traditional sources and services. According to the same surveys, faculty members recognized the value of Information Literacy, but appeared unwilling to collaborate with the library for the implementation of pertinent IL programs, possibly because this required a serious effort to pass from the established teacher-centered model of education into a more learner-centered one.

Substantially, the surveys identified a huge weakness in the university's internal environment, the cautiousness towards intra-institutional collaborations and towards new models of education. Moreover, they located a major threat in the external environment, the Internet, even in its scientific version of credible data-bases, which most members of the institution used, without acknowledging the library's role in acquiring, managing and disseminating them. However, the surveys also underlined the arising opportunities coming from state or other forms of funding, that could upraise the library's role in this field and they recognized that, despite all the difficulties, the library had to turn the Internet from a threat into a capability to design and develop "IL programs", not only in-face-to-face, but also in electronic form.

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[1] This article is based on a paper that will also be presented at the 25th Panhellenic Academic Libraries Conference: Academic Libraries and Open Science, Rethymno: University of Crete, 10-11 October 2019.

A few years later, HEAL-Link implemented the Project "Advanced Open Access Digital Libraries Services" under the "Digital Convergence" Operational Program of the 2007-2013 NSRF, offering an opportunity for Hellenic Academic Libraries to upgrade their role via a series of online services. Among them were implemented the "Information Literacy Platform for End users and for Librarians - ILSeab" **[4]** and the "Law Advisory Service for Intellectual Property-HEALLEGAL" **[5]**.

This opportunity, along with any funding opportunities, as well as free tools and scientific networks, in the wider environment of the Hellenic higher education and of the library sector internationally, should be exploited and any threats, such as the general financial crisis and the bureaucratic drawbacks had to be addressed. Additionally, taking into account the internal environment's strengths, such as the positive attitude of the library's management, its specialized staff, their interest in learning, and simultaneously its weaknesses, with most important the lack of sufficient number of technical support staff, the unwillingness of faculty members in co-operating and their cautiousness in the creation and support of a new service, accompanied by the extra workload, the lack of additional incentives and the librarians' doubts in taking up teaching duties, the endeavor to set up an IL service in the NTUA library was indeed difficult, but it was considered necessary **[6]**.

II.   First step: Applying the LO concept to prepare an IL Service

Utilizing the two aforementioned HEAL-Link Services, but also adopting the modern international trend of the so-called 'Learning Organization' (LO), that proposes a different approach to human resources management, this of establishing a learning culture within an organization **[7]**, the NTUA Library decided to apply an "Information Literacy Hour" (ILH) learning program for its staff. The ultimate aim of the ILH was to promote the idea that, in addition to their traditional role of accumulating, managing, and disseminating information, as well as science and fiction works, libraries need to change their orientation and become "learning organizations", both for their users and their staff, if they themselves want to be modernized and to take a more active role in the community they serve **[8]**. The specific objectives of the ILH were to familiarize librarians with the concept of Information Literacy and to make them capable users and designers of IL programs. Consequently, an "indoors" Information Literacy program could be used as one of the best opportunities to establish a "learning organization" culture in the Library and to help it become a more active partner within the NTUA.

In more detail, two experienced librarians, with official training in the fields of IL and of Education respectively, on their own initiative and by the support of the library's management, undertook the task to study the material provided by the relevant HEAL-Link Services, as well as additional IL material and to adapt it to the objectives of the ILH. Furthermore, it was considered necessary to study and present the most important learning/teaching theories (Behaviorism - Reproduction, Social / Cognitive Behaviorism - Simulation, Cognitivism - Discovery, Constructivism - Production) **[9]**. This decision was made because of the IFLA's guidelines for the IL in Lifelong Learning **[10]** and due to the scientific position that there is no right or wrong learning theory, since not all educational practices are based on a particular school of thought **[11]**.Therefore, librarians need to choose that theory, with its variants, which is compatible with their teaching style, as well as with the subject to be taught.

The "Information Literacy Hour" (ILH) - training program was designed and implemented mainly based on the educational model of the so-called "Production", which derives from the learning theory of Constructivism. This model was chosen because it was considered more suitable for adult practitioners who own formal knowledge and years of experience, which usually lead to 'consolidated views', or, in the terminology of learning theories, to a 'cognitive balance'. This balance, however, can and should be 'disrupted' in order to bring about new knowledge. An effective way to achieve this is by asking learners to resolve problems **[9]**. For this reason, eight ILH workshops with distinct objectives were created and each workshop was built, as the titles indicate below in Figure 1, on questions to be answered. Furthermore, the "Production" teaching model gave participants the opportunity to approach each question in their individual way and find the answers that best suited each one. During the workshops, presentations were made using power point and live exercises took place. Interaction with participants, questions and comments were also strongly encouraged.

Information Literacy Hour for Librarians (ILH)
1. What is a reference desk for an academic library? Which is its purpose and what are its specific objectives?
2. Information Literacy. According to your opinion, what is IL? Do you believe that libraries can undertake an active role for its development and its promotion?
3. Examples of IL programs in libraries IL Standards: which of these do libraries implement? IL organizations, units and networks. Which services of the NTUA Library do its faculty members really use? What are their opinions on IL?
4. What is plagiarism?
5-7. IL exercises based on four teaching models: Reproduction, Simulation, Discovery, Production.
8. Evaluation: IL Exam.

Figure 1- Information Literacy Hour for Librarians (ILH)

The "Information Literacy Hour" (ILH)-training program took place from January to April 2015, twice a week, within the library's working hours, so as everyone interested could participate without the library's operations being disturbed. After the completion of the program, the following

Strengths, Weaknesses, Opportunities and Threats were identified:

Information Literacy Hour for Librarians - SWOT Analysis

Strengths - What do we do best?
- Accumulation, management & dissemination of information and knowledge.
- Information searching strategies / techniques.
- Techniques of information evaluation.
- Avoiding plagiarism.
- Compiling bibliography and references.

Weaknesses - What could we improve?
- Techniques for analyzing academic/scientific topics in appropriate search terms and keywords.
- Dissemination/promotion of ways to access information and knowledge.
- Dissemination/promotion of information evaluation techniques.
- Strategies/techniques for studying and effectively integrating information into academic/scientific papers.
- Dissemination/promotion of the IL value.
- Quantitative and qualitative adequacy of infrastructure (software, sites, computers, promotional material).

Opportunities
- Free tools on the Internet.
- Free quality electronic services with Greek content.

Threats
- The Internet.
- Lack of adequate number of technical and scientific support staff for the freely available online services of HEAL-Link.
- Lack of a national and/or intra-institutional strategy for further utilizing the library and the IL in learning processes.

III. Second Step: Designing and Implementing the IL Service

In the fall of 2016, the first attempt was made to design a general IL program for the NTUA students, modeled on the aforementioned HEAL-Link Service "Information Literacy Platform for End-users" **[12]**. Failure to cooperate with HEAL-Link, mainly due to lack of adequate number of staff for scientific and technical support of its freely available online services, coupled with the same lack at the NTUA Library, led to a provisional decision of utilizing a simple online blog, which was free, easy to use and open to anyone interested, but with little interaction, as well as with commercial advertising.

In March 2017, the responsible librarian designed the program "Information Literacy Workshops", based on the blog's material and on the theory of constructivism, where possible. With the valuable help of the only and therefore overloaded computer staff of the library, the blog's content was transferred in the new web site of the NTUA Library, but in a more interactive format.

Finally, in the fall of 2017, the IL team collaborated with the NTUA graphic designer to create promotional IL material (IL Leaflet), which, however, was printed at private expense

due to the financial and bureaucratic difficulties of the institution.

The project was disclosed to the NTUA Library Senate Committee (NTUA-LSC), in which at least one faculty member from each of the 9 Schools of the institution participates. Although the NTUA-LSC viewed the project with interest, only one of its members ultimately agreed to use it.

More specifically, in February 2017 a collaboration was made between the IL team and a faculty member of the NTUA School of Chemical Engineering, in order to adapt the material of the existing IL general program to the requirements of the course "Analytical Chemistry, Semester II, Inorganic and Analytical Chemistry Laboratory". The faculty member introduced a task in the form of an academic paper, which all students in the course were required to write, in order to pass the course. A first round of one-shot workshops took place eight times, from the end of February to the end of March 2017, in the library's workshop room. The librarians, with the presence of the pertinent faculty members and using the previously mentioned blog as a key-guide to the Information Literacy Skills, instructed about 14 students each time, how to write the paper on task. In February 2018, the same faculty member collaborated again with the IL team and a second round of workshops took place in the same way, but this time, using as a key-guide and tool the aforementioned website.

In the fall of 2018, the same faculty member of the School of Chemical Engineering of the NTUA co-operated again with the IL team. The third round of workshops took place in October 2018, twice, in one-shot style, in the laboratory of the School of Chemical Engineering, with the presence of the pertinent faculty members and with the participation of approximately 60 students each time. Unlike the two previous cycles, where there was only one PC for 14-15 people, each student was now constantly interacting with the content of the workshop, because each one was working individually in front of a PC. However, this lacked the benefits of the collaborative teaching model, while the large laboratory room required more staff and time for explanations and comments and greater effort to coordinate the trainees. In this case, the weaknesses of the design of the program were more pronounced, particularly in relation to the inter-individual and socio-cognitive learning, proposed by constructivism. This is an important conclusion that should be taken into account in the future opportunity of redesigning the program.

IV. Third step: Evaluating the IL Service

During the second round, after the end of each of the 8 IL workshops, evaluation questionnaires were distributed to the participants, aiming to examine the extent to which the workshop's objectives had been achieved and to collect information that would allow the extraction of valid conclusions for future improvements. Out of 137 respondents, the results were as follows:

In Assessment Exercise 1 (Figure 2), the participants were asked to identify 8 words, derived from the title of their academic topic, as a "subject term" or as a "keyword". 114 participants were able to identify correctly 5 or more words,

with the average of the successful answers being ~6 out of 8. This understanding on their behalf, helps them to articulate appropriately their topic with regard to the search tool they use, e.g. bibliographic catalog or the Internet, when searching for scientific information.
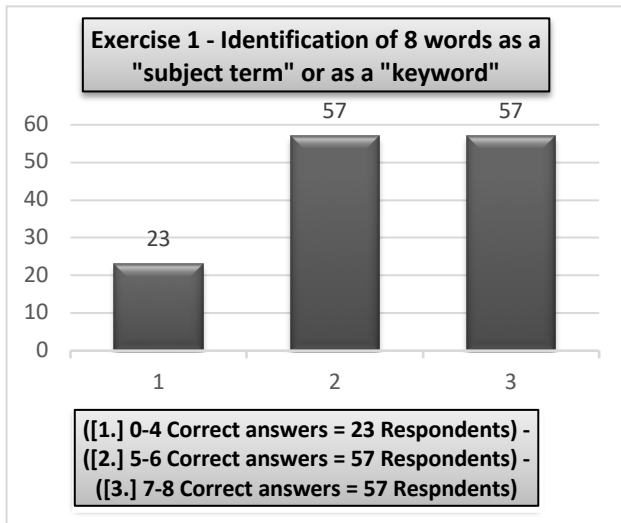

Figure 2 – Exercise 1

In Assessment Exercise 2 (Figure 3), the participants were asked to match three terms with the corresponding type of scientific work. The purpose was to examine if the participants understood what is a primarily study scientific work, a mainly research scientific work, and what is a mixed type of scientific work. 104 of them fully understood the basic categories of a scientific work, with the average of the correct answers being ~2.5 out of 3. This knowledge facilitates them to conduct the bibliographic search and the literature review that is required by the type of their academic work.
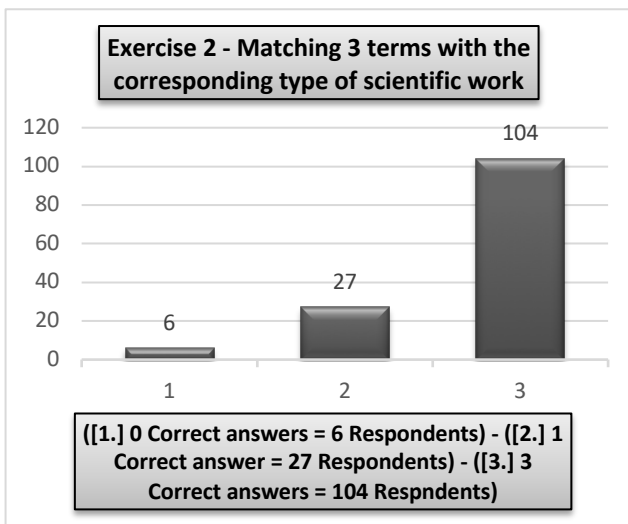

Figure 3 – Exercise 2

In Assessment Exercise 3 (Figure 4), the participants were asked to choose the appropriate way to access the full text of a source, depending on its type (e.g. print, borrowed or inter-loaned from a library, or electronic, which they download either via an institutional network because it is contained in a fee-paying database, either free of charge,

etc.). The average of the right answers was ~2 out of 4, while only 33 answered all 4 questions correctly. This means that 91 persons do not fully understand how to access the full text of each source they discover, while 13 do not understand it at all. This may be due to the lack of library use in Greek secondary education, a fact that leads many undergraduates to believe that everything is free on the Internet. However, a lack of understanding of how to access the full text of a source may also be due to a failure in the wording of the specific question, or even to a failure in the design of the exercise during the teaching process. In any case, a more effective strategy is needed to promote the understanding of how to access the full text of the sources, as well as to 'advertise' not only the wealth of the reliable sources provided by the library, but also the costs and the labor required for this purpose.
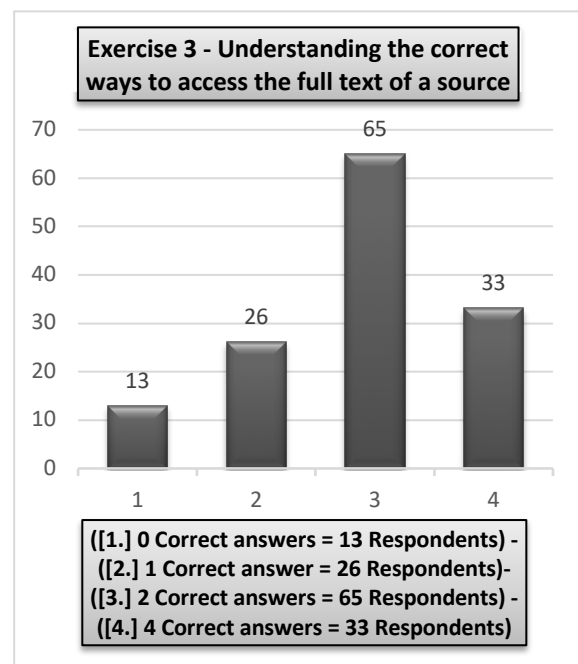

Figure 4 – Exercise 3

In Assessment Exercise 4 (Figure 5), the participants were asked to identify the basic criteria for assessing the reliability of the source that they obtain, as well as its relevance to the subject of their academic topic, which would help them use its content more critically when writing an academic paper, a dissertation, etc. In this exercise, they demonstrated a high success rate, with 130 participants answering 6 to 9 questions correctly, while the average of the correct answers was ~7.6 out of 9.
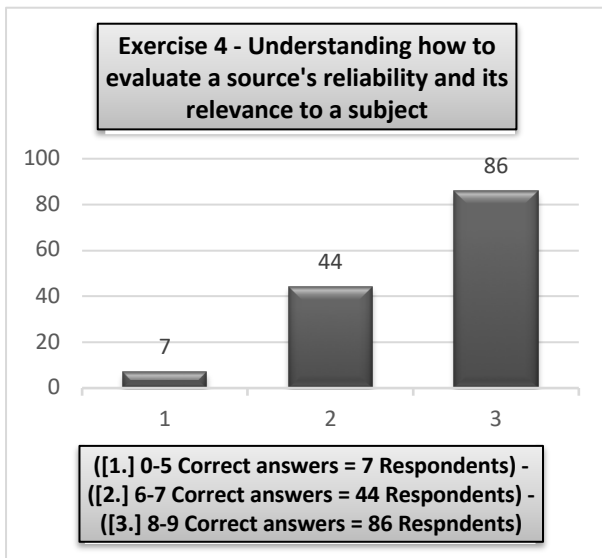
Exercise 4 - Understanding how to evaluate a source's reliability and its relevance to a subject

([1.] 0-5 Correct answers = 7 Respondents) - ([2.] 6-7 Correct answers = 44 Respondents) - ([3.] 8-9 Correct answers = 86 Respndents)

Figure 5 – Exercise 4

Finally, in Assessment Exercise 5 (Figure 6) the participants were asked to identify how to avoid plagiarism. 107 of them answered all three questions correctly, while the average of correct answers was ~2.7 out of 3, which indicates that they understand the importance of ethical use of information, data and knowledge.
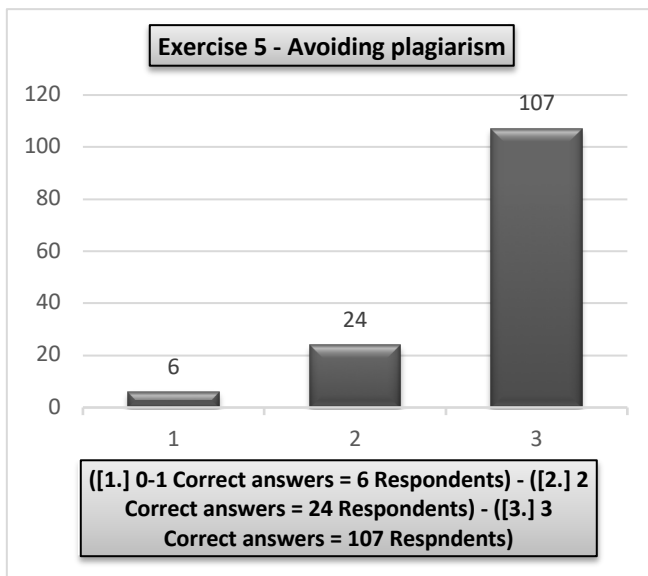
Exercise 5 - Avoiding plagiarism

([1.] 0-1 Correct answers = 6 Respondents) - ([2.] 2 Correct answers = 24 Respondents) - ([3.] 3 Correct answers = 107 Respndents)

Figure 5 - Exercise 5

At the beginning of 2019, a collaboration was made with the lecturers of the NTUA Interdisciplinary Postgraduate Program "Environment and Development". As in the previous three undergraduate student IL workshop cycles, the 22 post-graduate students were also given an academic topic to write. This time, the workshop's evaluation took place in two different stages, firstly, at the introduction to the workshop and secondly, after it was completed. The purpose of this process was to compare students' responses at the beginning and at the end, in order to assess the impact that the workshop had on the students' IL knowledge.

In summary, the percentage of the improvement in the responses regarding the proper way to access the full text of

a source, but also in recognizing its credibility and relevance to the topic, was satisfactory, averaging 20%. Regarding plagiarism, the improvement was quite little (less than 5%), but with a very good percentage of answers (over 95%) in the introduction of the workshop. While students appear to be sufficiently aware of plagiarism, questions are raised about the reasons why they eventually do it, according to this Postgraduate Program teachers' opinion, which is a subject that needs further investigation.

Finally, it is worth noting that the cross-sectional nature of this Postgraduate Program requires the use of additional sources of social information coming from the free web, such as blogs, websites, forums etc. Such sources often lack formal and reliable supervision, leaving the responsibility for evaluation to the end users [13]. Therefore, in a future redesign of such a workshop, it is necessary to provide up-to-date evaluation guidelines for this type of digital sources, especially as the volume of data available on the free web is shockingly high and constantly increasing [14]. Essentially, a 'digital literacy' framework should be developed to stimulate students in order to think critically and to identify any 'fake information', if they are to survive in today's digitally interconnected and saturated world [15].

CONCLUSIONS

As a general conclusion, below are depicted and summarized all the Strengths, Weaknesses, Opportunities and Threats that have been identified during this almost ten years process of thinking, surveying, discussing, designing, implementing and evaluating an IL Service in a Hellenic Academic Library.

Information Literacy Service - SWOT Analysis
Strengths
• Positive attitude of the library management.
• Specialized staff.
• Staff interested in continuing professional development.
• Library best-fitted for the role of IL promotion.
• Accumulation, management & dissemination of information and knowledge.
• Knowledge of information searching strategies/ techniques.
• Knowledge of techniques of information evaluation.
• Knowledge on how to avoid plagiarism.
• Specialized Knowledge for compiling bibliography and references.

Weaknesses
• Academic staff's cautiousness towards intra-institutional partnerships and new models of education.
• Quantitative shortage of technical support staff.
• Cautiousness about the creation and support of a new service, due to extra workload and due to concerns of librarians about their capability in taking-on an educational role.
• Lack of additional incentives.
• Insufficient knowledge of techniques for analyzing academic/scientific topics in appropriate search terms and keywords.

- Deficient dissemination/promotion of ways to access information and knowledge and to promote the library's wealth of quality and credible sources.
- Deficient dissemination/promotion of information evaluation techniques.
- Insufficient knowledge of strategies/techniques for studying and effectively integrating information into academic/scientific papers.
- Deficient dissemination/promotion of the IL value.
- Quantitative and qualitative inadequacy of infrastructure (software, sites, computers, promotional material).

Opportunities
- Free tools on the Internet.
- Free quality electronic services with Greek content by HEAL-Link.
- State or other financial aid.
- Networking with national and international associations of professionals and scientists.
- Implementing new human resource management models that promote continuing professional development in the working environment (e.g. Learning Organization).
- Exploitation of the emergence of continually developing IL Standards, such as, "media literacy", "digital fluency", etc.
- Official/obligatory establishment/use of the use of a plagiarism software.
- Development of intra-institutional partnerships.

Threats
- The Internet.
- Lack of adequate number of technical and scientific support staff for the freely available online services of HEAL-Link.
- Lack of a national and / or intra-institutional strategy for further utilizing the library and the IL in learning processes.
- Financial crisis.

As discouraging as it may seem, it is an imperative for every library to endeavor to establish an IL Service because, according to the new ACRL Framework for Information Literacy (IL) **[16]**, "The higher education environment is transforming very rapidly and is in constant interaction with the dynamic and often uncertain information ecosystem in which we all now live and work, requiring us to re-focus our attention on the fundamental ideas around it:

- Students have a greater role and responsibility in understanding the outlines and changing dynamics of the information world, in the ethical use of information, data and knowledge, and in the creation of new knowledge.

- The teaching staff has a greater responsibility in curriculum design and assignment, so as to encourage a more active interaction with the concepts of information and knowledge within their discipline.

-Librarians have a greater responsibility in identifying key ideas within their own field of study, so as that they can expand students' learning, greater responsibility in creating a new coherent information literacy curriculum, and greater responsibility for extensive collaboration with schools, faculties and educational units.».

PROPOSALS

Bearing in mind what the new ACRL framework highlights and those calling for more action **[17]**, as well as the conclusions of the SWOT analysis, what should the library do? We live in the age of information, interconnection and globalization, where barriers of all kinds are gradually disappearing. As part of this interconnected academic ecosystem, the library can increase its viability and evolution through its involvement in the curriculum design and in the educational process **[18], [19]**. For these reasons, the NTUA Central Library:

- Drafted a proposal for the "Establishment of Information Literacy Workshops in the Curriculum", with no academic credits, intended for submission to the newly elected Rectorate. In the proposal, it sets as its primary goal to equip faculty members, researchers, students and employees, with 'information literacy' (IL) skills, which will enable them to make the most of the library's information sources and of the services it offers.

- Strives to develop inter-institutional collaborations, with the NTUA Schools, the Network Center, the Computing Center, and other NTUA Units, in order to achieve quantitative and qualitative adequacy of infrastructure (software, sites, computers, promotional material).

- Further promotes the use of a plagiarism software within the institution, via informative workshops and promotional material.

- Re-establishes staff training seminars within the library, in tune with the "Learning Organization" trend.

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