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Editorial message

Dear Colleagues,

It is with pleasure to announce the new issue of the **Journal of Integrated Information Management (JIIM)** publication. **JIIM** is an international, multidisciplinary, blind peer-reviewed journal that publishes research efforts on all aspects and issues regarding Information Science and Integrated Information Management.

Expressing our commitment to promoting high-grade quality scientific papers, we present you with the current issue, which contains five articles.

The main theme of the first article concerns academic libraries' adaptation in the ongoing technological and management innovation. This is a meaningful contribution to the local and international library and information community's deeper understanding of the factors that hinder or foster Hellenic Academic Libraries' adaptation to the information society's demands. The next article presents and discusses useful findings of the perception and the implications of **Plagiarism**, derived from a survey that was conducted in 2018, in undergraduate students and academic staff. Plagiarism is one of the main aspects that **Information Literacy (IL)** seeks to face. Therefore, the third article is dedicated to an **IL Service SWOT analysis**, recording a real story of an IL Service development deepening in design, implementation, evaluation, successes and failures. The article concludes by proposing better practices that urge **Hellenic Academic Libraries** to create from scratch their own IL Services or to develop their existed ones further.

Next article is about different efforts exerted on the acquisition and preservation of industrial archives in Greece, aiming to uncover the challenges that new archivists may encounter. The final article focuses on the **Department of Archives, Library and Information Studies of the University of West Attica** curriculum reform. Specifically, the courses program expanded to meet the informational needs of cultural heritage institutions, such as museums and cultural centres, concerning the interrelationship of the Horizon2020 Project "**CrossCult**", in which the Department mentioned above participated.

We are aiming at making **JIIM** a reputable scientific communication channel, and we are now welcoming submissions for the upcoming journal issues as well as proposals for **Special Issues**. Your proposal should be no more than five pages and include at least an executive summary, a proper justification why the Special Issue is needed and how it is suitable with the **JIIM** topics. Special Issues proposals should be sent directly via email the Assistant Editor-in-chief (dkouis@uniwa.gr).

Finally, we expect your contribution and active support with remarks and points of improvement.

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Canvassing Greek Academic Librarians' Opinion of Their Organizations' Position on the Library Evolution Continuum.

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Abstract:

Purpose - The study analyzes academic librarian convenience sample's responses to an online survey seeking to identify the current innovation and transformation facts and figures of the Greek academic library in the overarching aim to contribute to the higher education community knowledge base on current trends and challenges along the academic librarianship evolution continuum[1].

Design/methodology/approach – The research involved the distribution of a questionnaire that sought to investigate library staff perspectives and considerations about service provision, innovation adoption, and organizational development-related aspects. It was further complemented with additional contextual information resulting from the inspection of official library webpages.

Findings - The survey results representing 25 Greek higher education Institutions through responses received by administrative and executive staff in 22 central and nine academic branch libraries indicate academic library services with the highest and lowest statistical presence. Partnerships development is acknowledged as a top library transformation motivator while budgetary, infrastructural, and staffing issues are listed at the top of the library transformation inhibitors. There were also indications of insufficient strategic planning. Findings also suggest the need to enhance organizational development processes for sustaining and increasing innovation by transforming the library into a double loop learning organization.

Index Terms — **academic libraries; library innovation; professional development; information commons; strategic documentation**

I. INTRODUCTION

The global economic recession, globalization challenges, scarcity of resources, and public funding cuts have caused deep changes in academic libraries around the world **[1]**. The

• repurpose the library space to support collaborative learning,
• redeploy the library staff and

situation of the Greek academic libraries[2] is not too different from the state of the American higher education (HE) system at the turn of the 21st century and the current South European counterparts. Within this evolving context, Greek academic libraries are being subjected to unparalleled degrees of public scrutiny and accountability, which exert considerable stress on their stability as components of the broader higher education ecosystem.

Besides the set of challenges that the digital revolution has confronted libraries with, it has opened up new opportunities for the libraries to (1) build ubiquitous, dynamic, varied, active, and immersive learning environments, within the coordinates of a pioneering dynamic cognitive ecosystem that shifts the education paradigm from simple content delivery toward engaging and connecting learners through active learning, critical thinking, collaborative exchange, and knowledge creation **[2-3]**; (2) re-conceptualize their operations in tandem with learning practice; (3) reweave together classrooms and libraries, labs and informal learning spaces; (4) respond and adapt to remain relevant by balancing new initiatives with core service areas such as instruction and collection development **[4]**.

The pressing requirements for new approaches to the design and delivery of new library services, as they are moving away from book warehouses to high tech study halls, information gateways, and learning and teaching partners **[5]**, have engaged libraries in an ambitious quest for useful models and innovations. They have also encouraged the experimentation with a variety of approaches that, drawing on new technologies **[6]** and in line with key stakeholders' demands and the European Higher Education Area (EHEA) mandates, have led to "…the birth of a new library model that is more firmly grounded in user engagement and participation than ever before..." **[7, p.475]**.

This new library model can be considered a response to the challenges associated with pressures to:
• reposition the role of the user in the contemporary information commons,
• stretch the budget and the organizational structures,
• come up with a new set of services and accommodations that necessitate a strategic paradigm shift that will eventually dim traditional organizational boundaries in such

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[1] The term 'continuum' is metaphorically used to express the library progression scale.

[2] For the purposes of our study, we have grouped the libraries in both universities and Technological Educational Institutes (TEI), under the 'academic libraries' umbrella term.

a way that the word library will be no more capable to adequately cover the entire scope of both virtual and physical academic support services that are offered to patrons today **[8]**.

These challenges have ultimately reoriented the research on academic librarianship and the foci of related interventions placing Information Literacy, E-learning, Social Media, Open Access, Knowledge Management, Altmetrics, Research Support, Scholarly Publishing, MOOCs, Service Quality, and Mobile Apps in Academic Libraries among the top twenty library and information science (LIS) most used topics since 2013 (>56 times) in the Web of Science (Figure 1). The argument of reorientation of LIS research and practice is also supported by a recent Scopus index database keyword analysis. Findings are indicative of a considerable increase in the use of the following keywords in LIS articles: Collaboration, Marketing, Distance Education, and Information Literacy, presenting a 718%, 566%, 453%, and 330% increase respectively between the years 2000-2006 and 2007-2013. They also illustrate the emergence of new keywords, namely Professional Development, Partnerships, Benchmarking, Open Access, Social Media/Networks, E-learning, Library 2.0, and Usage Statistics, as well as the transformation or obsolescence of old keywords such as Cooperation, Personnel Training, and Quality Control.
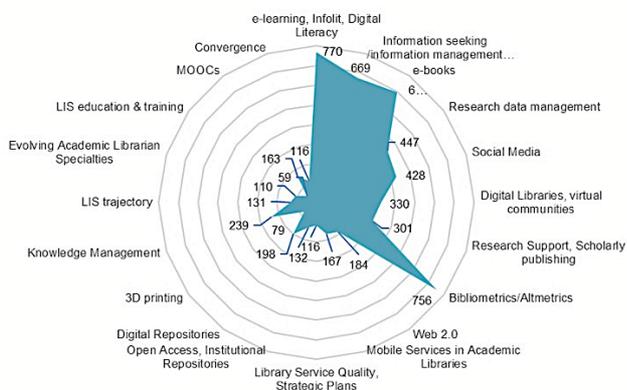
Figure 1. Most used LIS topics in the Web of Science since 2013 (data retrieved in August 2016)

II. AIMS AND OBJECTIVES

The main goal of this study is to contribute to the higher education community conversation about trends and challenges affecting the evolution of the Greek academic librarianship. The remarkable library automation and vertical and horizontal service enrichment developments initiated before the severe economic downturn of the last decade have been severely impacted by reduced total expenditures, and reference desk personnel decrease between 2011 and 2015, as recorded in the statistics of the Quality Assurance Unit for Academic Libraries. Also, according to the higher education public funding observatory Report **[9-10]**, the Greek HE public funding was among the 13 European systems in decline between 2008 and 2015 and among the 13 European systems in danger as

their funding to universities decreased while student numbers grew. Additionally, the National Bank of Greece Education Index **[11]**, an indicator of university independence based on the degree of flexibility in key issues such as student selection, staffing policy, budget autonomy, course content and performance evaluation, has placed Greek higher education in the 35th place. Overall, Greek universities rank at the bottom of international competition in terms of institutional independence, showing inflexibility in key issues such as student selection, staffing policy, budget autonomy— including sources of funding and allocation of expenditure— course content as well as setting objectives and performance evaluation.

In an attempt to better appreciate some of the complexities involved in the adaptation of Greek libraries to the evolving higher education landscape, the researchers decided to record and analyze the current innovation and transformation facts and figures of the academic library in a system thinking approach guided by the following research questions: (1) how the academic library is changing; (2) what the overall academic library innovation pace is; (3) how librarians stay current with latest developments in their field; (4) what the main factors hindering and enabling academic library transformation are.

The study's main objectives were to record academic librarian viewpoints on the degree of their libraries' transformation and pace of innovation and associated challenges. It was also considered essential for the purposes of the research to detect possible correlations between transformation, professional development, innovation, and organizational planning and, finally, to explore whether librarians are adequately adapting to the new generations' high valued attributes of building partnerships, teamwork, staff development, and initiative as identified in a study by Young et al. **[12]**.

III. METHODOLOGY

The design of the research methodology was inspired by previous studies **[13-14]** that provided an overview of the Spanish university libraries' status and their progress towards the Learning and Research Resource Centre model—also known as Centro de Recursos para el Aprendizaje y la Investigación-CRAI in Spanish, according to Pacios **[14]** which builds on the learning centers of the United Kingdom and the north American information commons. According to Beagle **[15]** and the Spanish University Libraries Network **[16]**, this new library model, a milestone on the library evolution continuum on the way to academic commons —is a dynamic student-centered setting that accommodates all the information and IT services necessary to support learning and research in the university **[15] [17]**.

This model goes beyond the access and retrieval function of the traditional reference service to support the full range of activities of information literacy, helping students to access, manage, integrate, evaluate, and create information

and knowledge. Since the year 2000, information commons have expanded their facilities and scope of activities by incorporating tutorial programs, writing centers, and faculty development centers to include a new focus on student learning, while many of them have also taken an additional step in changing their designation to learning commons **[18]**.

For the purposes of the study, we designed a mixed-methods instrument to specifically address the Greek higher education context, comprising 16 topic-specific items and nine socio-demographic questions. Before distributing the self-administered and anonymous questionnaire to the target population, namely academic library administrators[3] as identified in publicly available online resources, the questionnaire was forwarded to four LIS experts in June 2016 for initial feedback on the face and content validity. This first stage offered an initial check of the survey in terms of readability, clarity, comprehension and adequacy to the research objectives

Through the questionnaire's four basic constructs (Table 1), participants were asked to: (1) rate the importance of the collection of in-library use systematic data; (2) identify the level of transformation and innovation pace of their organization; (3) indicate their perceptions of barriers that the academic library faces today; (4) indicate the mode and frequency of continuing professional development (CPD); (5) briefly comment on newly introduced services in the open-ended survey item.

Survey instrument constructs

Construct A. Response Continuum: Library transformation		
No.	Questionnaire item	Item ID	Type
1.	Library transformation stage	Q.8	Likert
2.	Library transformation included in the university's strategic goals	Q.9	dichotomous
3.	Library transformation hindering factors	Q.10	Multiple-choice
4.	Library transformation conducive factors	Q.11	Multiple-choice
5.	Technological/organizational change implementation level	Q.17	matrix
Construct B. Response Continuum: Library innovation		
No.	Questionnaire item	Item ID	Type
1.	Innovation adoption culture	Q.21	matrix
2.	The necessity of other FOS processes integration in library practice	Q.12	Likert
3.	Newly introduced service innovation description	Q.23	Open-ended
Construct C. Response Continuum: Current and future service enhancement		
No.	Questionnaire item	Item ID	Type
1.	Officially/unofficially expressed service enhancement intention	Q.16	matrix
2.	Available library services	Q.18	Multiple-choice

No.		Item ID	Type
3.	Equipment / installations available	Q.19	Multiple-choice
4.	User training activities	Q.20	Multiple-choice
Construct D. Response Continuum: Organizational Development: Planning, funding, training			
No	Questionnaire item	Item ID	Type
1.	Organizational planning type	Q.14	Multiple-choice
2.	Importance of systematic in-library use data collection	Q.13	Likert
3.	Professional knowledge update actions/training frequency	Q.15	matrix
4.	Technological, organizational innovation service funding sources	Q.22	matrix

Additional Comments

Table 1.Survey items[4]

The survey was distributed to the librarians' institutional and personal email accounts, as listed on Greek academic library webpages. With the intention of improving response rates and judging from similar surveys, five follow-up reminders were sent to the survey recipients, the cover page was kept as brief as possible and the socio-demographic questions were reformulated so as not to collect any personal identification questions or contact information.

Despite the libraries' reduced summertime activity, outdated or obsolete library staff contact information, short-handed user services, and ongoing space renovation and consolidation works, participation to the self-selection survey can be considered adequate for this first explorative study. By September 15th, 2016, we had received at least one librarian response from either the central or departmental libraries of 25 out of the 37 higher education institutions, namely universities and technological educational institutes (TEI). During the survey period (July-September 2016) it was judged necessary to go through a series of different communication approaches, including regular follow-up reminders and telephone invitations to central libraries. Where faced with central library non-response cases, we extended our participation call to branch libraries as our best alternative. During our brief telephone conversations with the local directors or executive staff responsible of library operations in the absence of high rank administrators, it was made evident that branch libraries adhere to the same regulatory and operational frameworks as the central units and therefore can adequately provide reliable information on trends and challenges also affecting their central administrative units.

In parallel, we engaged in a university library website review in search of evidence for Learning Resource and Research Center (LRRC) model's integration. This review did not necessarily attempt to cross-validate the survey findings,

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[3] For the purposes of this paper, the term 'administrator' is used solely as an in-text umbrella term to describe decision-makers, that is non-executive staff.

[4] The survey items have been summarized for the economy of publication space. The questionnaire is nevertheless available upon request.

but rather to capture different dimensions of the examined phenomena, thus increasing our level of topic-specific knowledge and strengthening our standpoint at the time of data analysis.

IV. FINDINGS

The mixed-methods survey instrument (Table 1) was developed with the overarching intention of exploring academic librarian viewpoints on a series of interconnected variables associated with library transformation, innovation culture, and services, organizational planning and development. It received responses from 22 central and nine public university branch libraries, representing 25 Greek HE institutions. Inspection for missing data and duplicity of the total of 38 responses received returned 31 valid responses. In the case of duplicate records, the researchers opted for keeping responses from the head of the library over the responses from the executive staff.

Most respondents, nineteen library directors and deputy directors, ten librarians, and two library technicians, had more than nine years of experience in their current job posts and were within the 40–50 age range.

Twenty-eight out of the 31 participants reported some type of service change underway with technological change implementation rates outnumbering the organizational ones. As to the nature of these new developments, they revolve around the implementation of radio frequency identification systems (RFID), institutional repository development, participation in collaborative integrated library catalog initiatives, modern authentication systems, digitization, self-archiving, and self-check station services. Most frequently offered services were electronic journals, group study spaces, and information literacy courses while involvement in massive online open courses (MOOCs), blogging and e-learning courses, creation of audiovisual and language labs, and evaluation of research outcomes were found to be the least statistically significant. Furthermore, all the respondents acknowledged the process of systematically recording in-library use data from important to very important. When library administrators were also asked to rate the importance of enriching library services with products and processes originating in other fields of science (Q.12), 26 out of the 31 respondents considered it to be from somewhat important to extremely important.

According to participants' responses to questionnaire item Q.16, unofficial positive stance towards the upgrade of existing services is at least three times higher than the official standpoint. As to their reaction to the question about library transformation conducive factors (Q.11), respondents acknowledged technological progress and the development of partnerships as the first and second main factors respectively. When asked to indicate their library's organizational planning culture (Q.14), respondents reported a moderate predominance of tactical planning over strategic planning processes, with only four cases

recognizing the co-existence of both. On the other hand, librarians (Figure 2) indicated the lack of trained human resources, the lack of profession-specific knowledge update and the lack of institutional support as top library transformation inhibitors.
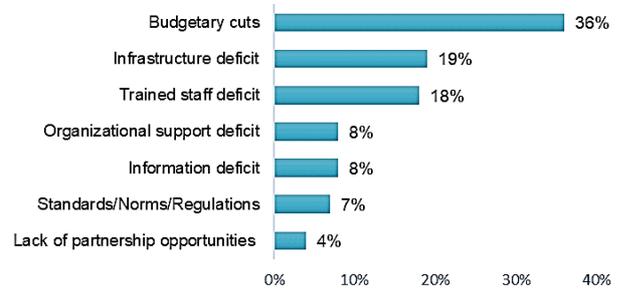
Figure 2. Library transformation hindering factors (Q.10)

Only 16% of the respondents recognized their organizations as fully evolved to have reached the fourth and final stage of full compliance with the LRRC model (Figure 3 - Q.8). As to the type of academic library innovation, 18 librarians reported a technological innovation profile between late adopter and laggard. On the contrary, organizational innovation adoption was leaning towards the innovator and early adopter type (Q.21).
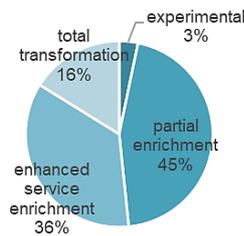
Figure 3. LRRC types distribution of participating libraries to the study (Q.8)

Finally, findings on participation frequency in continuing professional development activities (Q.15) reveal that seminars, conferences, and training attendance increases as the library advances to higher transformation levels.

Bayesian correlation pairs analyses between 'congress attendance frequency' and 'technological change implementation' (BF11.025) revealed a significant positive correlation. Conversely, 'organizational change' appears to have no significant correlation with 'conference attendance' or any other professional development interventions. Overall, no other noteworthy correlations were detected between other survey items.

Cronbach's alpha reliability value of 0.767 for questions Q.8, Q.13, Q.14, and Q.21 verified that these survey items were sufficiently intercorrelated. Nevertheless, researchers agreed on the necessity of modifying at a later stage dichotomous and matrix questions to Likert items, with the intention of increasing the number of variables in each subscale prior to disseminating the survey in a larger study. They were also convinced of the utility of co-developing

reliable rubrics for the questions in collaboration with the local library community to accelerate the instrument's future operationalization.

As to the library webpage search that followed the analysis of the survey findings with the intention to complement the research, it corroborated the research results on the degree of library transformation at the 25 participating institutions in about seventy-five percent (75%) of the self-reported cases. As to the rest of the participating libraries, three cases of the self-reported highly LRRC model-compliant ones were observed to project a moderate to low innovative institutional website profile, while an equal number of less LRRC model-oriented libraries were advertising a highly innovative agenda. The review of the library online documentation also revealed the scarcity of explicit reference to the LRRC model implementation and the lack of updates on library progress and future course of action (Figure 4).

Figure 4. Findings of the official university library online documentation's inspection

V.   DISCUSSION

The Bologna Declaration[5] marked the beginning of deep changes for the European university libraries, as they took a turn towards the adoption of new or enhanced services to respond to the new challenges. During that time (1994-2013) and in parallel with the initiatives of other European counterparts supporting their transformation process through a series of strategic plans inspired by the UK, USA, and Australian experiences, the Greek academic libraries had been capitalizing on both national and European Union funding **[19]**. These plans and investments supported numerous developments on an infrastructural, staff development, and interlibrary collaboration level, as reflected on their webpages, with the support and guidance of the National Documentation Center, and the Hellenic Academic Libraries Link. These substantial developments, however, run the risk of becoming compromised due to the budgetary cuts and expenditure decreases of the last decade.

The emergence of new librarian profiles, precipitated by socioeconomic and technological advances, has redefined the position of the library at the higher education pedagogic debate table, inspiring at the same time a pluralistic vision and a culture of wider convergence within the institutions. While librarians around the globe are streamlining their transformation through key drivers such as trend-watching, competitive intelligence and technologic vigilance, the Greek academic librarians are struggling to make the best of their decimated available resources against a series of deficiencies.

Responses to the open-ended questions emphasized this situation. For instance, one respondent took the opportunity to comment inter alia on the: "Shortage in staff and financial debility [that] make library initiative ineffective; the same goes for planning, implementation and evaluation issues. How can one deal with variables in the absence of constants? ..." The comment of another respondent focused on the impact of the economic crisis emphasizing that due to the "library complex role, the state ought to reconsider staff allocation" and funding:

''Economic crisis [that] compromises all the work done in terms of new services and inter-university collaboration. The lack of the necessary trained personnel and shortage in staff will eventually degrade certain services in the future as it is difficult for existing workforce due to excessive workload to participate in seminars, training, and conferences, etc. and doesn't, therefore, stay current with latest advancements in the LIS field. [...] Library is not in the position to offer portable equipment and more generally speaking new information management devices neither can it provide digital content (e.g. e-books via KALLIPOS[6] system) due to copyright and funding issues.''

Overall, participants reported that major changes revolved around the implementation of radio frequency identification systems, institutional repository development, participation in collaborative integrated library catalog initiatives, modern authentication systems, digitization, self-archiving, and self-check station services. Regarding the average number of services offered, at least a hundred percent (100%) increase in the number of services between the library experimental and the total transformation levels was observed. Another noteworthy finding was that, as academic libraries progress towards the LRRC model total integration level, they are gradually slowing down progress related to infrastructure and gradually increasing their focus on user training. Overall, electronic journals, group study spaces, and information literacy courses were found to be the services with the highest statistical presence. On the other hand, involvement in massive online open courses (MOOCs), blogging and e-learning courses, creation of audiovisual/language labs, and evaluation of research

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[5] Bologna Declaration is a commitment freely taken by each of the 29 signatory countries to reform its own higher education system or systems in order to create overall convergence at European level. More information on https://www.eurashe.eu/library/bologna_1999_bologna-declaration-pdf/

[6] The project Kallipos is the first comprehensive effort to introduce electronic, interactive multimedia textbooks in Greek higher education. More information is available online at https://www.kallipos.gr/en/

outcomes are roles that few libraries seem to have assumed very actively.

A positive aspect is that librarians are beginning to consider the recording of in-library use data, a development just as important as the introduction of tools, knowledge, and techniques from other disciplines in the academic library routines. This could be an indication of an attitudinal change and a growth mindset towards adopting a new type of organizational culture involving knowledge management and innovative capitalization of the institution's intellectual capital. In an era that necessitates a "common space to strengthen academic community and foster new developments in teaching and research within the institution" **[20]**, convergence, multi-disciplinarity, and powerful user-centric infrastructure, Greek libraries still seem resistant to actively embark on a more dynamic participation in less traditional interventions such as e-learning and social media, and the challenging conversation focusing the transition from information to learning commons.

According to participants' responses to questionnaire item Q.16, unofficial positive stance towards the upgrade of existing services is at least three times higher the official standpoint. This could be partially attributed, to the fact that library administrators and higher ranked library staff are more aware of the full range of implications linked to the reconceptualization of services, products, and processes within the institutional settings from an organizational, financial, operational, and strategic alignment point of view. As a result, library directors are more skeptic about disruptive innovations as they are fully cognizant of the existing constraints that arise from the condition of the bureaucracy-embedded state university. These constraints are further complicated by contracts, faculty norms, and traditions from which the research library inherits many of its characteristics as part of a larger organization **[21]**, with significant external controls and authority residing outside its walls, as well as their obligation to act within these institutional authorities articulated frameworks.

As to the question (Q.11) about library transformation conducive factors, respondents acknowledged technological progress and the development of partnerships as the first and second main factors respectively. When library administrators were asked to rate the importance of enriching library services with products and processes originating in other fields of science (Q.12), 26 out of the 31 respondents considered them to be from somewhat important to extremely important. These observations signpost a significant turn in what used to be considered a priority in the traditional library functions. They reflect the changing librarian mindset from the more traditional collection development to technology advances and partnerships' enhancement. The results also reveal a noteworthy low percentage associated with the impact of social demand on academic library transformation which possibly denotes a moderate disconnection not just

between the library and broader institutional strategic goals but also between the inner world of the academia and regional or national reforms **[22]**.

When asked to indicate their library's organizational planning culture (Q.14), respondents reported a predominance of tactical planning over strategic planning processes, with only four cases recognizing the co-existence of both. These answers could explain why the organizational and technological innovations are faced with an institutional 'FAST' and 'FASTER' two-speed approach as the tactical planning makes the organization fast-track library IT changes, while the rest of the management structures and processes continue operating at the old pace. This situation eventually leads to an operational disconnection further leading to complexity, lack of coordination and quality issues, not to mention low organizational performance as explained in the organizational lag study by Damanpour and Evan in 1984 **[23]**. Overall, the responses reveal too much planning and not enough strategic thinking and action, which suggests that existing structures are built for a slower pace of change and the library program is not linked to institutional priorities.

In line with the previous observations, responses (Q.10) related to factors hindering the deep and pervasive library transformation from information to learning commons **[18]**, spotlight a series of issues associated with communication and knowledge transfer, organizational support and employee development (Figure 2). More specifically, besides budgetary and infrastructural aspects, respondents indicated the lack of trained human resources, profession-specific knowledge update and institutional support to be among the major reasons for the slow-paced adaptation to the LRRC model. Their choices indicate the importance attributed to staying current with recent academic librarianship developments by attending CPD activities—seminars, conferences, training sessions, etc.—as one way to prevent what McLuhan very eloquently described as "trying to do today's job with yesterday's tools and yesterday's concepts" **[24, p. 110]**..

Only a few librarians recognized their organizations as fully evolved to have reached the fourth LRRC stage (Figure 3 - Q.8), according to the American Council of Education typology **[15]**. As for the type of academic library innovation, most librarians reported a late adopter/laggard profile of technological innovation. On the contrary, the predominant organizational innovation adoption type was more on the innovator/early adopter side (Q.21). Several conflicting responses between staff members of the same organization in relation to their library's transformation and innovation pace reflect the rather diversified mix of academic and professional backgrounds, communication styles, and personal values of the library staff and may be also considered an indication of the ambiguity that surrounds the existing library typology. Furthermore, findings support the argument that there is not a single academic library LRRC model and that libraries, in their attempt to promptly

address local challenges, are not judging necessary the adoption of the LRRC title and its full range of services.

As for service innovation, 28 out of the 31 participants reported some type of service change underway. The fact that the technological change implementation rates outnumber the organizational ones may be attributed to the fact that organizational change is a more complicated and time-consuming process that involves the reconceptualization of both institutional policies and organizational culture. As for the predominance of evaluation and redesign cases where organizational change is concerned, authors believe this is an issue that could and should very well become the object of further research (Q.17).

The creation of learning environments to promote active learning, critical thinking, and knowledge creation is among top higher education challenges as illustrated in the Educause Teaching and Learning Challenges 2009 Project [3]. This endeavor, apart from the creative imagination to ask the right questions, the courage to pursue real and risky changes, discipline, and critical thinking [2], requires proactively setting up a continuing education project portfolio that would constitute librarians' first line of defense against obsolescence [25].

Survey results indicate that there is still room for Greek academic libraries' improvement in terms of their responsiveness to the learning organization principles that make librarian continuing professional development an integral part of its policies, structure, and culture. These principles are essential to foster employee engagement and double-loop learning through a series of initiatives that go beyond the monitorization of the environment to the questioning of the impact of learning and change on the organization [26-27]. Overall, it seems that the underlying culture within Greek academic libraries inhibits their ability to promptly address international trends, developments, and effectively manage innovation. As argued by Myburgh [28] and Weiner [29], such a situation can be further exacerbated by the strong mimetic forces that originating in official curricula, professional networks, and hiring processes create a sphere of common organizational structures and practices that minimize the influx of new knowledge and consequently reduce the academic library innovation rates.

The findings on participation frequency in continuing professional development activities (Q.15) reveal that seminars, conferences, and training attendance increases as the library advances to higher transformation levels. This increase, which may be attributed to the pressing need for ex-post in-depth familiarization with changing paradigms to successfully cope with newly introduced services, suggests that most CPD activities follow, rather than precede, changes. It also highlights a significant organizational

development gap which can and should be addressed appropriately from the early stages to minimize the risk of failing the stakeholders' expectations.

More specifically, our findings support the prevalence in Greek academic libraries of developing or applying tools without preparing the organizational culture beforehand as our research revealed that the frequency of CPD activities increases only as libraries progress to the next transformation stages. This situation is further aggravated by the absence of structures that support the systematic diffusion of developments that would eventually help librarians to maintain their skills-based timeliness and enhance their adaptability to change within a holistic reconceptualization framework. The importance and necessity of these skills have been repeatedly emphasized by LIS experts [30-31], [25]. As to interrelations between the variables of continuing professional development and organizational and technological change, our Bayesian correlation pairs analyses [7] revealed a significant positive correlation between 'congress attendance frequency' and 'technological change implementation' (BF11.025). Conversely, 'organizational change' appears to have no significant correlation with 'conference attendance' or any other professional development interventions. Overall, no other noteworthy correlations were detected between other survey items.

While the survey did not ask for details on the 'other' professional development activities' questionnaire option, this aspect ought to be further investigated in future research. Nevertheless, if taking into consideration Online Computer Library Center's (OCLC) 'A snapshot of Priorities & Perspectives' Report [32], this dimension might very well include but not necessarily be limited to social media, internet, in-person discussions with colleagues at the workplace, listservs, and scholarly publications.

Library webpage search, conducted in parallel to the survey, corroborated the survey findings on the degree of transformation of Greek academic libraries in about seventy-five percent (75%) of the self-reported cases. An inconsistency, however, was detected in relation to investigated libraries' innovation profiles. More specifically, one-third of the self-reported highly LRRC model compliant libraries were observed to project a moderate to low innovative institutional website profile, while a similar percentage of the least LRRC model-oriented libraries were nevertheless showcasing a highly innovative agenda. This disagreement could be attributed to the self- reporting approach adopted for the study that relies on the participants' own experience, beliefs and attitudes. If taking a closer look to the individual lenses that may have affected to a certain degree the responses and subsequently the validity of conclusions that have been drawn, we could also suggest the necessity to further explore the library website

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[7] Analyses conducted using JASP Team. JASP (Version 0.9) Computer software. <https://jasp-stats.org/>

update policies and procedures, including the investigation of whether and how it involves library staff input at any stage. One should also take into consideration the fact that there exists no LRRC universal model and that the lack of standardization of the information commons' enhanced functions, as they are developed to basically respond to local needs, in combination to the respondents' own definitions of innovation and progress, may have skewed their responses and could become object of future research.

The online publication of academic library strategic documentation can be considered an integral part of the library's identity. According to Kuchi **[33, p.153]**, communicating a clear message that library users can understand helps the organization to better handle changes in a turbulent environment, as well as to reduce confusion and ''…ensure the stakeholders continued participation, trust, and confidence with the library's programs and activities''. The review of the official library online documentation of the 25 survey participating institutions showed that, apart from the explicit reference to the parent institution's goals and a moderate library mission sophistication, when available, it barely makes explicit reference to LRRC implementation. Neither does it detail library progress achieved and its future course of action (Figure 4).

VI. Conclusions and Future Lines of Research

Libraries under the EHEA requirements and thanks to the latest technological and pedagogical developments are seeing their role, impact, and visibility upgraded on their way to becoming a crucial university quality indicator. Although investigations have recently been focusing on how changes affect library operations, including space accommodations, service development, quality assurance models' implementation, partnerships and librarian competencies for the new educational scenarios **[34-41],** the researchers were not able to identify any specific study exploring the Greek academic library evolution towards the LRRC model.

Therefore, in the face of increased circulation against the decreased funding and subsequently staff shortage and resource reduction caused by one of the worst economic crises in the Greek history—according to the statistics of the Greek Quality Assurance Unit of Academic Libraries' (MODIPAV) between 2011 and 2015—the authors decided to embark on a study of the country's library transformation by directly surveying library administrators in order to generate an up-to-date snapshot of the Greek public academic libraries' ecosystem. The aim of this mixed-methods first exploratory study was twofold: (1) it envisioned adding current information to the local and international academic library community's knowledge base around Greek public university libraries' position on the evolution continuum, which has not to the day been thoroughly investigated; (2) it aimed to pilot a new survey instrument that, building on past international research, intends bringing to light academic librarians' perceptions

around library transformation, innovation culture, organizational planning, and development. At an overarching meta-level, this study has attempted to identify the factors that weigh upon the library transformation phenomenon as well as to investigate in the international literature the reasons impacting the development of the Greek LRRCs.

Though restricted budgets have considerably slowed down inter alia digitization projects and put a hold to digital academic journal library subscriptions, they do not seem, however, to have affected the librarians' willingness and determination to move the academic library forward. Their responses demonstrated a strong positive stance towards the adoption of multidisciplinary approaches in library operations, and the systematization of library use data collection processes. Nevertheless, regardless of how positive the library administration may seem toward changing paradigms, responses associated with library staff continuing professional development suggest a gap in the organizational development mechanism and are indicative of several issues related to strategic planning and the effects of disjoint incrementalism. These responses are expected to contribute to the discussion around: (1) the urgent need to re-conceptualize the new information professional training and development to adequately address tech-diffused scenarios and workflow changes, as according to Marcum and George **[6]** "the most critical part of technology is not the tool but the human skill that uses it to accomplish a task"; (2) the re-alignment of library operations to strategic planning; (3) the importance of updating institutional web pages so as to accurately reflect the identity, direction, and accomplishments of the library in a way to support sustainability, stability, and long-enduring benefits.

The analysis of the results also highlights the necessity to take actions to close the Greek academic library strategic knowledge gap and align strategy to knowledge **[42]**, establish or enhance the critical processes essential to developing and mobilizing intangible resources on all potential dimensions. It finally suggests the enhancement of organizational development structures in a way to best support the transformation of the library into a double loop learning organization encouraging knowledge acquisition and diffusion among the members of the organization and closely affiliated stakeholders. Detected correlations and differences of opinion between library colleagues, namely administrative and executive staff, mirror the problematic nature of a system that lacks the frequency and intensity of interactions (collaboration, communication and coordination) between members of the organization necessary to foster a shared understanding of their definition of progress and development and is seen by the authors as one more opportunity to conduct further investigations. Finally, as the growing complexity and dynamics of the field call for an increased specialization and collaboration that should be better addressed with a holistic approach, it would be interesting to further investigate in a

future study the degree to which the target population considers innovation, CPD, and the change of organizational culture as critical components of the same broader ecosystem.

The merit of this study resides not so much in the number of responses collected but in the current information it would add to the local community's knowledge and understanding of the trends, shared challenges, and interrelations in the area of public academic library transformation, innovation, planning and staff professional development. However, readers should not extrapolate findings of the nonrandom sample to any population other than the individuals expressing their points of view as it could lead to drawing far-reaching conclusions on the context and its constituents. Despite the study limitations, as most of the participants were personally invited to share their opinion, this study is expected to make a valuable addition to the conversation about the reconceptualization of organizational development in Greece and other similar academic library contexts until conducting a larger study that would provide a greater diversity of viewpoints on the investigated topics.

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Plagiarism: initial research findings in undergraduate students

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Abstract:

Purpose - This paper presents and discusses the main results of a small-scale research concerning students' and academic staff's perceptions about plagiarism and its implications. The research was conducted in 2018, at the Department of Archival, Library & Information Studies, University of West Attica, with the use of two separate on-line questionnaires.

Design/methodology/approach – The questionnaires, consisted of open and closed-ended questions, were sent respectively to the undergraduate students and to the academic staff of the Department. As a result, 62 questionnaires were completed by the students (~10% of the whole population) and 9 by the academic staff, which was the total number of the faculty members at the time of the study.

Findings - The findings demonstrate that the students' and the academic staff's comprehension and perception of the term plagiarism, as well as their attitude towards the disciplinary implications, that this phenomenon entails, make it an imperative for academic realm and especially for libraries to deal with it actively and proactively.

Originality/value – Useful findings were made regarding the perception and the comprehension of plagiarism phenomenon for undergraduate students.

Index Terms **— Plagiarism, Understanding plagiarism, Information Literacy, Higher Education, Statistical analysis.**

I. INTRODUCTION

Currently, there has been much debate regarding plagiarism. It is indisputable, that plagiarism is a controversial issue, and thus it is open to a number of interpretations. But what is plagiarism? Plagiarism is the act of appropriating the expressions or the wording and consequently, the thoughts and ideas of someone else, without crediting them to their creator or without referencing the used source. Similarly, Stern **[1, p. 1]** points out that plagiarism is the use of someone else's work, that might consist of words, ideas or images, either published or not, without attributing this work to its creator. Essentially, plagiarism means to commit intellectual property theft, in order to present it as new and original. Practically, a plagiarist steals someone else's work

and at the same time they lie about their act, because they present it as their own **[2]**.

Given the fact that, plagiarism is a confusing concept, there is confusion defining it **[3, p. 32]**. It is obvious that there are many definitions of the term plagiarism **[4]**.

Plagiarism is not a problem only for the academic community. Apparently, it is related to the ethical use of information and it entails both social and economic implications. It is worth mentioning that, due to the scientific and the economic value of information, the person who commits plagiarism can obtain benefits related to his professional or academic status. Therefore, when plagiarism has been detected, it may bring significant and various implications. For example, in academic realm, committing plagiarism may result in academic staff losing their position, or in students encountering disciplinary implications, such as suspension from studying. Moreover, given the fact that plagiarism is an unethical act can also tarnish the reputation of a university **[5, p. 610]**. In business world, it may result in lack of trust and simultaneously, in endangering someone's career **[1, pp. 1-2]**, **[6, p. 34]**.

Furthermore, plagiarism, apart from infringement of academic rules and ethics, is a linguistic phenomenon **[6, p. 1]**. In other words, it is directly related to language use and to ways in which an author embeds data, information and views in their text. There are many kinds of plagiarism. However, the most severe of them, according to Klausman **[7]**, are direct plagiarism, paraphrase plagiarism and patchwork plagiarism. Direct plagiarism occurs when someone copies phrases verbatim, without referencing the source, while in paraphrase plagiarism, someone alters the wording in order to change the language used in the original source. Finally, patchwork plagiarism occurs when someone copies expressions or wording from different sources and different writers, either verbatim or in paraphrasing and mingles them with their own language **[8, pp. 24-26]**.

At last, plagiarism can be defined as deliberate or unintentional. The key to avoid unintentional plagiarism is fair and correct use of bibliographic references **[1, pp. 2-5]**. Perhaps, it is useful to point out that one controversial form of plagiarism is self-plagiarism, for which there are many questions and a lot of discussion, because it is confused with republication. However, the current paper does not intent to analyze the term plagiarism in such a detail.

II. AIMS AND OBJECTIVES

This paper is based on the results of a small-scale research, which was conducted in the University of West Attica, in Spring of 2018. The research's tools consisted of two electronic questionnaires, which contained open and mainly closed-type questions. The first questionnaire was answered by 62 undergraduate students of the Department of Archival, Library & Information Studies, while the second questionnaire was answered by 9 members of the Department's academic staff. It is remarkable that the population of the faculty of the Department was 9 members at the time the research was conducted and all of them had answered the questionnaire. In addition, the student's population was approximately 600. 62 students had answered the questionnaire (~10%), which is an adequate sample of the total population.

The research's results were used for the fulfillment of the Bachelor's thesis entitled: "Information law and plagiarism", written by the students Panagiota Gazi and Nikolia Mavropoulou. However, this paper focuses on the discussion of only certain research questions, which were chosen because they are considered primary to the library community. These are the following:

- What is plagiarism? Are we aware of its meaning?
- What do students and academic staff of the Department consider as plagiarism? Do they really understand it?
- Have they ever committed plagiarism, deliberately or not? What points do students and academic staff underline concerned with the plagiarism cases they have experienced?
- Why do students commit plagiarism? What are the main reasons?
- Should plagiarism be punished? What do students and academic staff of the Department, believe about disciplinary implications of plagiarism?

III. DISCUSSION

In this article[1], we will comment on answers of only certain questions, which were chosen because of their primary research interest. At first, it is worth mentioning that 38 out of 62 questionnaires (61,3%) have been answered by graduate students of the Department of Archival, Library & Information Studies. Graduates are considered by default more knowledgeable and experienced than undergraduates in plagiarism, as they have written a considerable number of papers and essays during their studies.

The first important question asked if the students are aware of the meaning of the term plagiarism. The overwhelming majority of them answered that they are. Only 3 students (4,8%) stated that they are not certain of its meaning (Figure 1). The majority of the answers in this question may not be objective and therefore may be

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[1] This article is based on a paper presented in the 24th Panhellenic Academic Libraries Conference, which was held in Larissa, Greece, November 2018.

misleading. Do students really know what plagiarism is, or they just believe that they do so? Is there a possibility that some students would not like to admit their ignorance on a subject they should have understood by now, because they are approaching the completion of their studies?
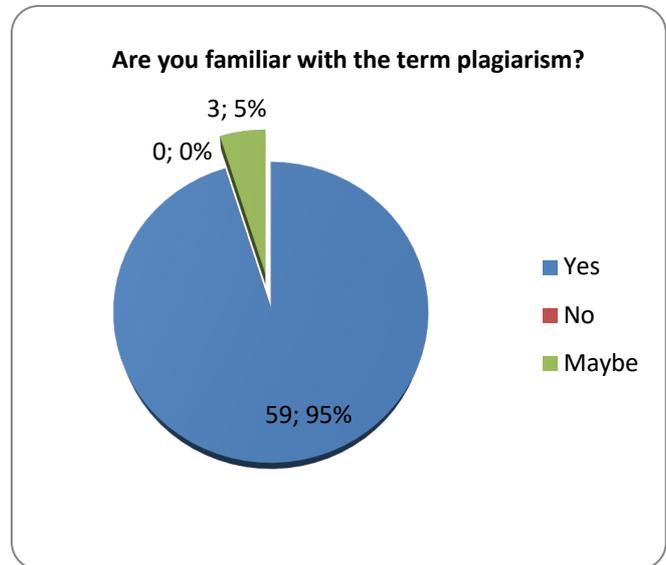
Figure 1. Understanding plagiarism (Students)

At this point, it would be useful to know, what did the Department's faculty members answer, to a related question. The question concerned their own beliefs about the extent to which students understand the term plagiarism. The answers evince a clear uncertainty that students have really comprehended the term plagiarism. In more detail, 5 members of the academic staff (55,6%) stated that, according to their opinion, students have not comprehended the meaning of plagiarism, while 3 of them (33,3%) answered that they are not certain to what extend the students are knowledgeable of it. Only one (1) member declared positively certain that students are knowledgeable of plagiarism.

We observe an important disagreement between students' and academics staff's views on the subject. In order to investigate the reason of this disagreement, it is necessary to compare the present research with similar ones. Sidera-Sideri **[9]** reports in her research that although students think they know the meaning of the term plagiarism, they have not really comprehended what plagiarism is **[9, pp. 235-236]**. Many students think that plagiarism is an act which concerns only verbatim copying and not paraphrasing **[9, p. 238]**. Evidently, students have not comprehended that paraphrasing, without referencing the original source and its creator, is also plagiarism.

Do you consider that your students have comprehended the meaning of the term plagiarism?

- Yes
- No
- Maybe

1; 11%
3; 33%
5; 56%
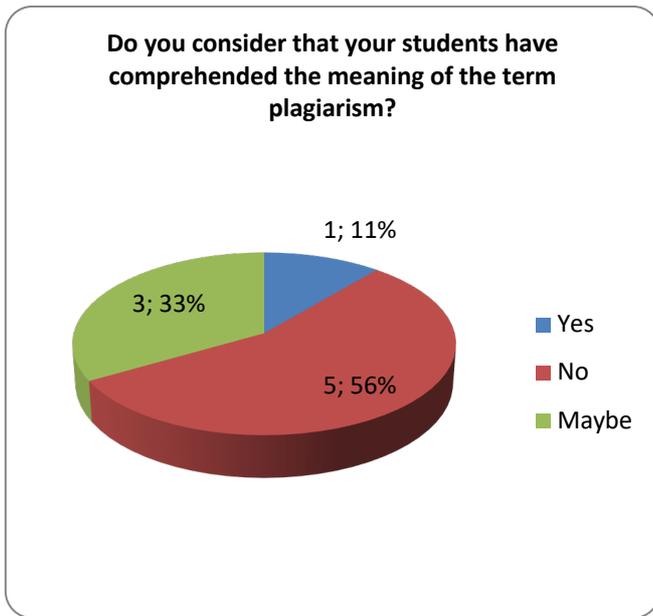
Figure 2. Understanding plagiarism (Academic staff views of their student's comprehension of plagiarism)

Do you believe that you have copied words, phrases or ideas of other authors without referencing them?

6; 10%   1; 1%
24; 39%
31; 50%

- Never
- Sometimes
- I am not certain
- I do it in every paper
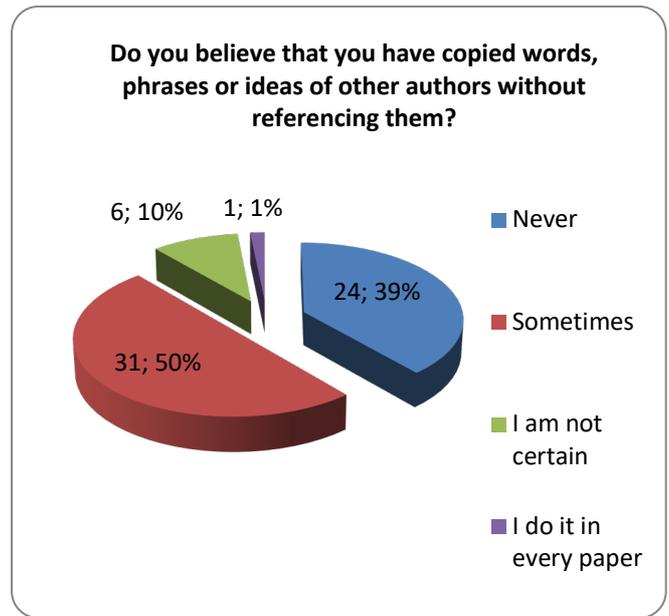
Figure 3. Plagiarism cases (Students)

Students' answers with regard to what degree they believe that they have committed plagiarism are quite interesting. 31 students out of 62 (50%) declared that they have copied words or ideas of other writers and therefore they have committed plagiarism. On the contrary 24 out of 62 (38,7%) answered that they have never done it, while 6 (9,7%) stated that they are not certain whether they have committed plagiarism and if so, they have probably done it unwittingly. The above answers are only indicative but they reinforce the conclusion that students do not know, to a satisfactory degree, the meaning of the term plagiarism and as a result they are unable to evaluate their own academic papers. In other words, they are not certain if their papers reflect the knowledge that they have derived after having studied and having understood the information contained in various resources and then producing their original wording or ideas, or if their papers are mainly copies and/or paraphrases. Finally, 1 student answered, probably in a sense of humor, that he/she commits plagiarism in his/her every academic paper (Figure 3).

It is worth mentioning that all 9 members of the faculty staff gave a positive answer to the question "Have you ever experienced plagiarism, on behalf of your students?" (Figure 4). Therefore, plagiarism, deliberate or not, to a larger or smaller extent, is present and it cannot be ignored.

Have you experienced plagiarism on behalf of your students?

0
9

- Yes
- No
- I do not know/I do not answer
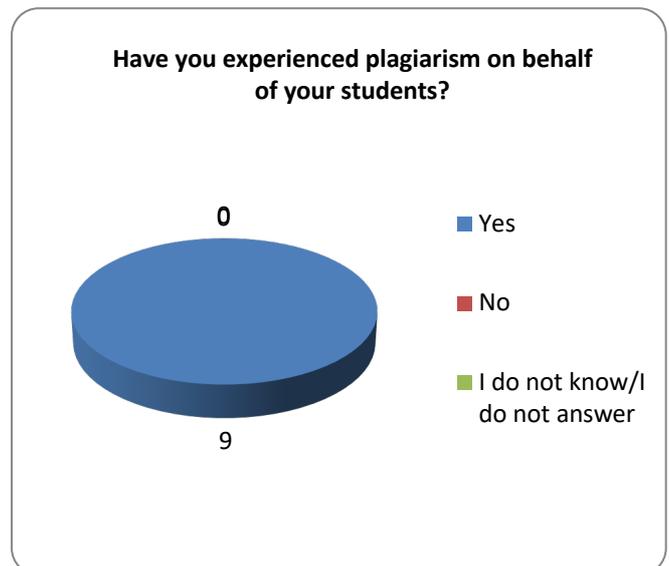
Figure 4. Plagiarism cases (Academic staff)

When students were asked "Has it ever come to your attention any incident of plagiarism, committed by a fellow student?", 25 students out of 62 (40,3%), namely the largest percentage, answered "Yes". Another 20 students (32,3%) gave the answer "I do not know/I do not answer", either due to the fact that no incident of plagiarism has come to their attention, either because they do not wish to refer to any incident of plagiarism, that may put them in a difficult position. The rest 17 students (27,4%) answered that they

are definitely unaware of any incident of plagiarism which has been committed by a fellow student (Figure 5).
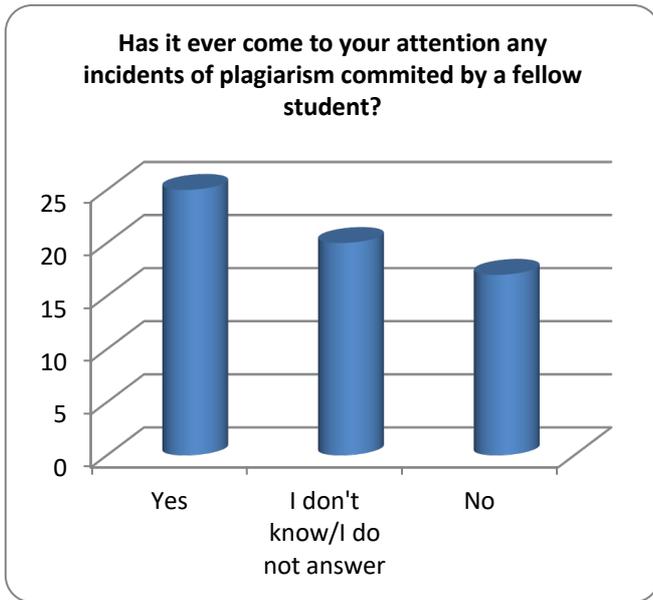
Figure 5. Plagiarism cases (Students)

When students were asked to complete a multiple choice question concerning the reasons why they choose to commit plagiarism, 40 students out of 62 (64,5%) chose as first option "Due to lack of time", while 37 students (59,7%) chose as second option "I consider that my academic paper and my ideas would not be good enough" (Figure 6). 36 students (58,1%) answered that they do not know if they have committed plagiarism, whereas 18 students (29%) answered that they believe they will not be caught and consequently they will not be punished.
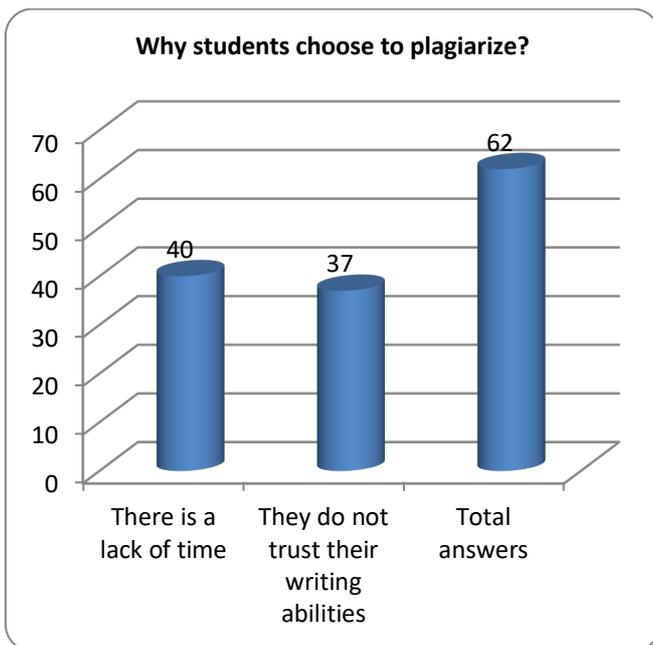
Figure 6. Reason of plagiarism (Students)

These answers are similar to those of two corresponding questions in Avramidou doctoral thesis, where students attribute the main reasons of committing plagiarism to lack of time and to poor trust into their academic writing skills **[8, pp. 102-106]**. It is particularly interesting that 64% of the respondents, in the same research **[8, p. 104]**, stated that they had committed plagiarism in the past, without encountering any disciplinary implications and therefore they did not hesitate to re-commit it deliberately. Liddell **[4, p. 45]** confirms that students plagiarize because they think not only that they won't caught, but also that if they caught, they will not be punished.

The next research question is related to the disciplinary implications which draw or should draw any proven cases of plagiarism committed by students. The 62 students of the Department were asked to answer the following question: "Do you agree that it is right for someone to be punished if he/she has committed plagiarism?". Most of the students consider that it is right, as 24 students agree (38,7%) and 17 students completely agree with plagiarism punishment (27,4%). Namely, the 66,1% of students in total, understand that plagiarism is an unethical action, is a violation of rules and it must be punished. Only 9 students (14,5%) answered that plagiarism should not draw any disciplinary implications. The rest 12 students (19,4%) preferred to take no position on the subject, as they answered, "I do not know" (Figure 7).
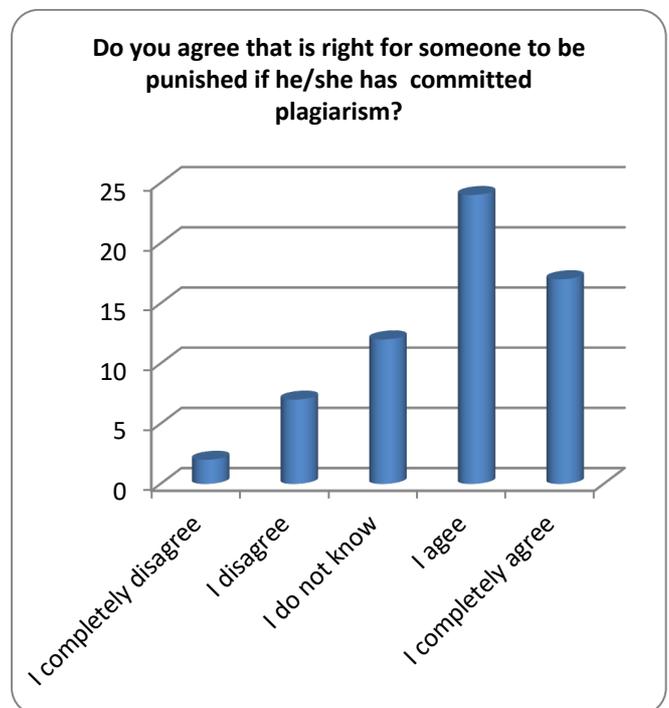
Figure 7. Punishment (Students)

In the same question, all 9 members of the faculty staff agree that incidents of plagiarism are blameworthy and therefore they should be punished. In more detail, academic staff was asked to answer the following question: "Do you agree that is right for someone to be punished if he/she has committed

plagiarism?" and they all agreed with punishment. It is characteristic that most of the academic staff members choose the option "I completely agree" (77,8%) while a remarkable percentage of them (22,2%) seem to be more lenient by choosing the option "I agree" (Figure 8).
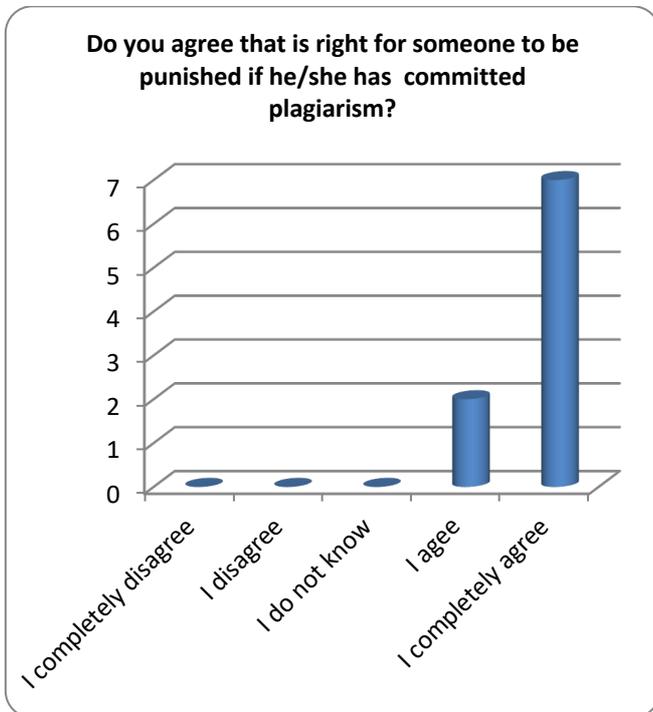
Figure 8. Punishment (Academic staff)

IV. CONCLUSIONS

The initial findings that derived from the interpretation of the students' and the academic staff's answers demonstrate their comprehension and their perception of the term plagiarism. It is essential that we have to point out the fact that most of the students have not understood completely the meaning and the implications of plagiarism. This assumption is also confirmed by the academic staff's answers. What is for sure, is that there is an underlying confusion about what exactly plagiarism is and about the ways of this phenomenon's handling and confrontation.

Furthermore, it should be highlighted that several students have committed plagiarism with the academic staff having noticed this. Therefore, they have undertaken the necessary disciplinary actions or recommendations towards students. Students and academic staff agree that disciplinary implications are imperative in order to prevent plagiarism among students.

It is obvious that plagiarism exists in academic world and consequently academic institutions, as well as libraries should take care of this phenomenon. In line with this, there have been developed software applications for the detection of plagiarism. Most of the Hellenic Universities have been subscribed to specific plagiarism detection software, called Turnitin [2] (Originality Check). Turnitin

juxtaposes texts of academic papers and articles with texts from the Internet, with published papers, such as articles and books and with students' papers or essays that have been submitted into the institutional repositories. In addition, it provides the ability to detect plagiarism even in a translated text.

Suffice it to say, that the role of the academic library is crucial. What actions should academic libraries take in order to eliminate plagiarism cases in academic realm? Actually, the use of a detection software, in general, seems to be helpful so as to eradicate the phenomenon [10]. Apart from that, a first step should be information literacy skills development of library users. Information literacy objectives focus on the effective retrieval and use of information and include directions on how to avoid plagiarism [11]. This fact leads us to acknowledge the importance of information literacy skills for students, scientists and researchers. After all, a core academic library role in the current information society is the promotion of information literacy with an emphasis to learning how to learn. In any case, information literacy skills improve learners' insight and consequently their critical thinking via the process of information review and evaluation.

Librarians are considered to be the experts who can play a new and active role in the learning environment [12, pp. 48-49], in teaching and learning [13] mainly because of their ability to provide access in information, anytime within any place or context. They are in a position to educate users through appropriate and adequate workshops in the library's physical and virtual environment. Users' education, in person (lectures and presentations) or from distance (on-line tutorials), should aim at developing skills such as, information retrieval techniques, sources' evaluation, bibliographic references, ethical use of information and scientific writing for academic purposes.

Many Hellenic Academic Libraries have already taken the initiative to develop information literacy programs and workshops, as well as to create sources and educational material concerning not only information literacy, but also plagiarism. Such an example is the information literacy on-line program that has been developed by the Central Library of the National Technical University of Athens (NTUA) (http://83.212.168.16/?page_id=559). Among others, the program provides an interactive exercise based on the book «What every student should know about avoiding plagiarism» [1].

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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.

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.
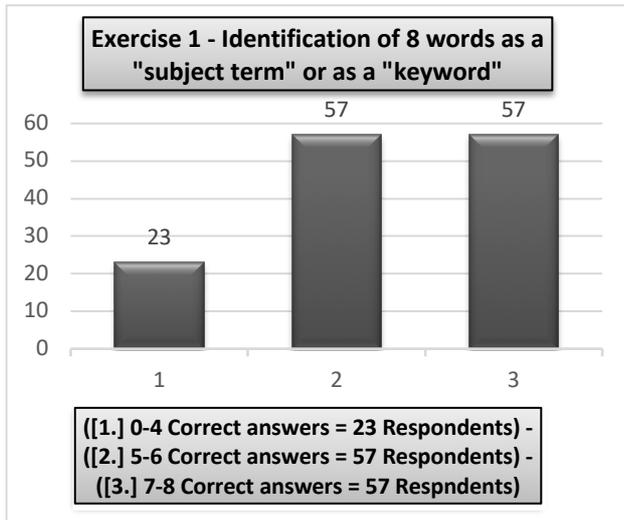
Figure 2 – Exercise 1

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.
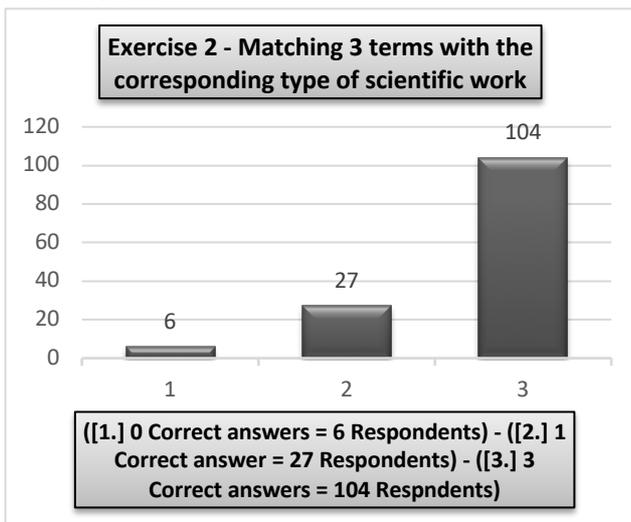
Figure 3 – Exercise 2

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.
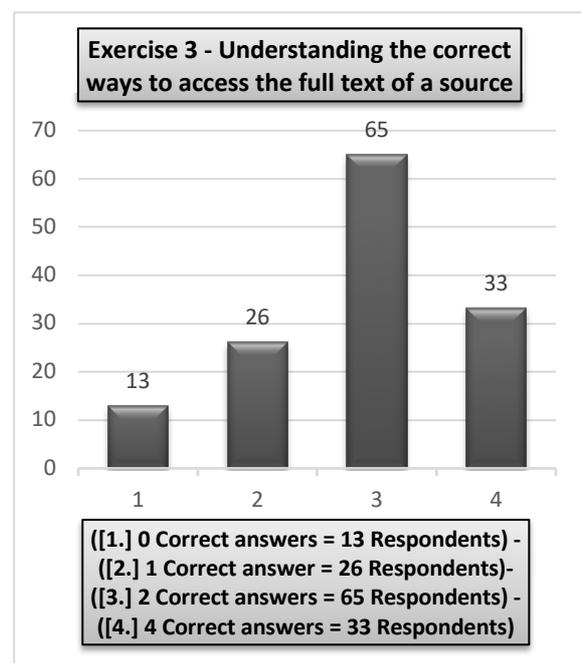
Figure 4 – Exercise 3

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)
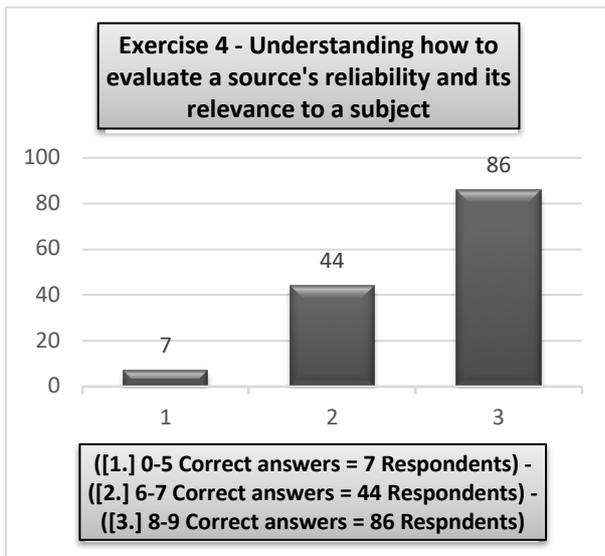
Figure 5 – Exercise 4

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)
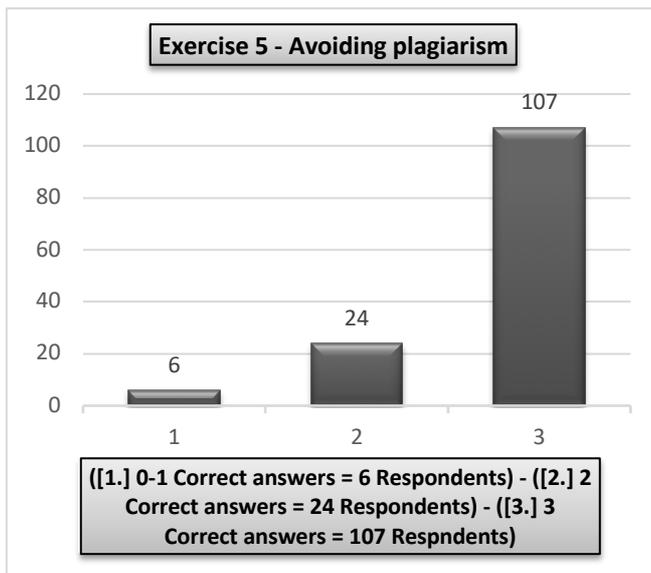
Figure 5 - Exercise 5

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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Acquiring Industrial Archives. Reviewing the Greek example

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Abstract:

Purpose - *In an era that any information is searched and understood in a digital environment there is still workload to be taken on a physical basis. Small and larger corporations keep abandoning their archives in dark storerooms. In order to bring these stories into the light of history and to broaden the available sources for researchers this article describes the efforts taken on the acquisition and preservation of industrial archives in Greece and discusses the steps that young archivists could follow for enriching business archives deposits.*

Design/methodology/approach - *The text recounts different efforts of managing industrial archives (acquisition, appraisal). This paper is mainly a retrospective that aims to summarize different cases in order to uncover the challenges of this field for young archivists.*

One of this text's assets is the discussion about the ways that the archival community has dealt with business archives and what could be done in terms of archives management policy. This article will prove useful to young archivists interested in the process of preserving historical business archives and managing future accruals.

Index Terms — Acquisition, Industry, Business Archives, Archival Heritage, Archival Policy

I. Introduction

In the late 1980s architects and historians introduced the interdisciplinary field of industrial archaeology to the Greek research community. Schools of Architecture started discussing the modern forms and design principles of industrial buildings, while industrial heritage specialists constituted in 1992 the Greek Department of the International Committee for the Conservation of Industrial Heritage (TICCIH). In the 1990s cultural heritage and related issues was a matter left in the hands of activist researchers. Uniting forces under one scientific club seemed the only way to persuade public servants and institutions for the social and economic value of these remnants. At the same time, researchers and engineers interested in historical machinery walked into various abandoned factories in search for various remnants of a productive period. In certain cases, they came across with piles of boxes including documents, accounting books, photographs and technical drawings and succeeded in preserving large industrial archives.

The young and small community of Greek archivists at that time left no other choice to engineers and historians but for urgent action. Thus, a scientific activism trend arose among researchers fascinated by industrial era and its historical landscape. It is quite possible that the adventurous spirit of industrial archaeology enhanced young researchers' interest. Many corresponded to this call for the preservation of the nation's productive heritage. In these early days of interdisciplinarity, team working must have been quite tempting for young historians, social scientists, conservatists and engineers. Their researches focused on documenting the long forgotten industrial past of Greece and tracing remnants of this activity. The 1990s was the most appropriate time for such a turn as deindustrialization was almost completed in the country. Large firms were transferring their establishments from Athens to its periphery. Architects and historians took active part in acquiring, cataloguing and preserving large units of corporate archives. Such cases are the archives of the French (1875-1989) and the Greek Mining Company (1873-1930), the Industry for Agricultural Fertilizers of Drapetsona (1909-1999), the Retsina Textile Industry (1872-1987) and the Couppas S.A. Machinery (1882-1987) [1, 2, 3]. Not all business archives were treated the same way. In the cases of the French and the Greek Mining Company and the Industry for Agricultural Fertilizers archives were stored for more than two decades. The absence of funding left those collections in the dark. Any archive stored without being indexed falls into oblivion. Similar acquisitions took place in the rest of the country were business archives were located inside abandoned offices and storage houses.

II. The Historical Bank of Greece

But these were only some of the total initiatives. Many of the preserved industrial archives in Greece ended in the hands of two Greek banks: The National Bank of Greece and the Piraeus Bank. Both institutions funded the country's postwar industrial development and thus bankrupting industries together with their archives ended in their hands. We should mention at this certain point that Piraeus Bank (ETBA-Investment Bank for Industrial Development at that time) took up the responsibility of managing the postwar Marshall plan. This Plan (officially known as the European Recovery Program-ERP) was an American initiative that aimed at helping western European countries to rebuild their national economies after WWII. The National Bank had interfered already since the Interwar period in funding the industrial sector. Since the end of the Greek Civil War both banks accepted loan requests from old and new companies who wanted to become part of the vision for national rebirth. This activity succeeded in

preserving several documents of business activity in Greece. Due to the absence of any thorough and national registry, bank archives are still one of the most convenient and rich sources for research in economic studies.

As far as the National Archives were concerned, it seems that at that time there was neither any acquisition policy towards private and business archives nor any discussions took place in the public space for an industrial archives depository. Before 1990s the General State Archives were facing many problems in their internal structure and there was no published policy towards archives. Thus, the management of bankrupted businesses and their archives was a matter concerning mainly the Greek banks. In the early 1980s the Historical Archive of the National Bank of Greece was reformed and introduced international practices of archives management. In its depositories large industrial archives were stored along with NBG's institutional archive. The bank's early interest for the national industrial economy and its potentials already since the late 19th c. resulted in a large series of files named Industrial Trust. Documents concerning every company's personnel, establishments, mechanical equipment and economic viability were filed in one or more files. The file's size depended on the activities and the operation time of each company. NBG's inspectors submitted one evaluation essay for all these companies that the bank was interested to loan. These evaluations include many useful information about corporate management, advertisement strategy, investment policy and risk management. Today the Industrial Trust series is possibly one of the most trustworthy sources for the documentation of past activities in the country's industrial sector.

III. THE CASE OF A DE-INDUSTRIALIZED HARBOUR

Greek public institutions had their share in the attempt for acquiring and preserving our late archival heritage. In the port-city of Volos an archival initiative appeared in 1991. It was the same year that the City Board of Volos decided to establish a City Archive, which would be enforced with the task of acquiring, organizing, indexing and preserving public and private archives produced inside the city's boundaries. The Municipal Center for Historical Research and Documentation (DIKI) in approximately 10 years succeeded to acquire large records units from abandoned factories that had operated in Volos. Nowadays its collections involve the archives of textile factories, a unique brick & tile industry, a cotton industry and the local electrical power company. The case of DIKI is possibly one of a kind in the Greek territory that the local authorities decided to take an active part in rescuing the local cultural heritage. This interest for corporate archives was not irrelevant to the City Board's decision to restore and reuse abandoned industrial buildings. The 1990's discussions for preserving industrial heritage brought up the question of how they should cope with large business archives.

In this case the acquisition proved a useful choice for the restoration projects as the architectural drawings of these corporate archives were used by architects in order to restore the buildings to their original form. In other cases of reuse, the restoration of these establishments to industrial

museums was completed based on documents from its business archives. Thus, in the case of Tsalapatas Brick & Tile Museum the preserved by DIKI corporate archives documented its expansions, the technological updates and its decay.

In the same city industrial archives were acquired also by the local Department of the Greek State Archives. The above industries of Volos were active in different sectors (agricultural technology, textile, food, alcohol, commercial etc.). Today the city continues to restore remnants of its industrial past. These archives are the key to the documentation of the city's and its citizens' past. The case of Volos is a successful example of how local initiatives activated public services for preserving the urban past for the sake of the future generations.

IV. THE PPC CASE

Quite lately another challenging initiative was taken by the Public Power Corporation, as the national electrical energy industry is named since 1950. PPC holds one of the largest preserved industrial archives. Its corporate records testify how energy industry developed in postwar Greece. Before WWII 400 small energy units operated across the country and powered cities and towns. Some archives of these small energy units were transferred to PPC from 1950s and on. Despite PPC's consistent policy of collecting these archives in 1960's, quite a number has been left inside these establishments and ended at the hands of other institutions or individuals.

Today, only a small but significant series out of PPC's huge archive has been arranged and indexed. The documents produced by the General Director's office were organized by its secretaries in files. The archivists had to deal with some major but frequent problems such as the inconsistence between the file's description and its content, the mixture of different documents in one file and unlabeled files. Still, these were not common cases. Most files were classified, and an expert could build the archive's series quite straightforward. The archive's series included topics such as international congresses and co-operations, payroll issues, occupational accidents and prohibition measures, directors' travels, technology transfer, mechanical equipment brochures and leaflets, the construction of hydroelectric stations, mining works and steam-powered production units. There is no doubt that the Director's Office series is one of the most interesting and challenging testimonies of how a large energy industry of public interest was established in post-war Greece. The citizens' letters to PPC concerning the benefits of electricity unveil the lust for technological improvement in postwar southeastern Europe. Apart from large public works and the inhabitants' reaction to them, a researcher may study the State-citizens relations in post-WWII Greece. An intriguing sub-series of files involves the correspondence of Greek citizens asking PPC to hire their relatives due to multiple reasons (victims of political discrimination, social incompetence, economic hardship).

In 2014 the company's Archives Department decided to acquire and transfer in its repositories the postwar archive of Couppas S.A. machinery company. This decision was the

outcome of the industrial archaeology's tuitions that had inspired young scientists in the previous decades. This archive had initially been taken away out of the factory's premises by the National Hellenic Research Foundation's research team.

This industrial archive was removed finally in 2015 out of Sivitanidios School storage rooms to the PPC's establishments in the neighborhood of Kolonos. One year later the process of opening the boxes started. The material was interesting at the first sight as Couppas S.A. had operated for more than a century (1882-1987) in the port city of Piraeus [4]. It was thought to be one of the most innovative and pioneering machine industries in Greece. Apart from the mass production of steam-engines and pumps in the pre-WWII period, during the following decades (1950s-60s) this industry took up some large public works concerning power units in Greece, eastern Mediterranean, Middle East and South Asia. Couppas S.A. was openly involved in the postwar program of launching and expanding the country's electrical network. In 1970s Couppas S.A. introduced the first Greek steamroller.

Couppas S.A. archive is a challenging training opportunity for young archivists and historians as one will have to deal with a vast variety of document types (corporate correspondence, financial accounts, engineering plans, administrative board's records, clients' files etc.). The archive remains enclosed in approximately 1.000 boxes in PPC's establishment. Professional archivists and interns are expected to take up the project of building a corporate archive in PPC from the point it was left. This is a unique opportunity especially now that the company is moving from coal-based production of electricity to eco-friendly renewable forms and all its records will soon need to be appraised, arranged and stored. The arrangement of these archives and the foundation of an archival service under this company could prove another challenge for Greek archivists.

V. MISFORTUNES

Apart from the aforementioned successful cases of dealing with large corporate archives, there are also some misfortunes that we need to refer to.

Case 1: For almost 10 years the Piraeus Bank Group Cultural Foundation together with the University of Thessaly co-organized a research program that aimed at locating and registering pre-industrial and industrial units that operated in Mt. Pilio in modern times (19th-20th c.). During this program (2000-2010) a group of historians located forgotten and sometimes covered by greenery industrial establishments and their remnants [5]. Most of them had not preserved their mechanical equipment nor written documents of their activities. The research team listed more than 200 mills where neither a document nor a photo surviving from its operation period was preserved.

Case 2: In January 2013 the Industrial Gas Museum gave the Greek public and the visitors of Athens the opportunity to revisit the Greek capital's past and wander into the buildings of an energy unit that inaugurated its operation more than a century ago. Though most of the plant's equipment has been maintained [6], only a few items out of

the company's archive have survived up today. Since 1984 that the Athens Municipal Gasworks Company (as it was renamed, after the French company dropped out in 1937) stopped operating, the premises were sealed till the mid-1990s. During that obscure period, the factory's archive was carried away and no one heard anything of it in the years to come.

Multiple documents from this corporate archive are being traded today by various collectors in the streets of Athens. A little number of documents and some relics have been preserved by the Industrial Gas Museum of Athens, where visitors can have a glance only at memories and individual documents. I should mention here that the factory's archive dated since 1857. The exhibited documents do not form any kind of archive as they had been selected by ex-workers in order to be exhibited.

This story brings in our mind the current state of corporate archival heritage in Greece and what needs to be done [7]. During the current economic crisis, a great number of companies have stopped operating while no one has any information about their archives and how they are handled. Large archival units are still being abandoned inside the corporate establishments as are of little value in comparison to machinery that can be sold for reuse. It is certain that the Greek State has dealt with serious losses as far as it concerns its public and private archives. Thus, the current crisis retains for Greek enterprises the challenge of dealing with their past. Usually, the absence of state provision is to be blamed though this could not be deemed as the main factor. The American example proves that companies can and should deal with their own past. The Business Archive Section Quarterly hosts in its volumes various projects organized by corporate archivists [8].

Unfortunately, most companies in our country have not realized the significance of their heritage and the possible profits-to-be-gained from their holistic management. The next task that the community of Greek archivists needs to take up is the introduction of the international perception for corporate archives as part of a company's and a country's cultural heritage inside academic curricula. We cannot invest anymore on infrequent factors for preserving and acquiring archives. We need to discuss and form a successful national strategy. To my views the success of such a plan can be secured only if companies are involved into this cause and archivists realize their role as heritage managers.

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LIS education and cultural heritage information management

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Article Info

Abstract:

Purpose - It has been more than two decades that LIS Education has been regarding information organizations (libraries, archives and museums) as an integrated field sharing a common basis of acquiring, handling and disseminating information independently of its source or substrate. In this respect LIS curriculum has treated resources at the basis of their descriptive, structural and administrative metadata; their semantic value; and the employment of technology as the means for creating a common platform for its organization, accessing and dissemination purposes.

Design/methodology/approach - Within this framework, LIS curriculum has expanded in order to meet the informational needs of cultural heritage institutions, such as museums and cultural centers. Furthermore, their requisites to create the fundamentals for their digital information management and digital presence in the web and their obligations to supply information and communicate with each other became also part of the curriculum. The latter introduced almost simultaneously the need to operate in common environment with archives and libraries that not only hold a significant amount of related information but also have common operational attributes. The latter has brought forward issues of interoperability, communication between metadata standards, the use of controlled vocabularies and semantic representation techniques.

All of the above, have established the notion in LIS Education that libraries, archives and museums are a global network of information organizations. At the same time, a series of cultural heritage projects, funded through the Horizon2020 [1] call were focusing on employing new technologies for staging cultural heritage content. The need for metadata and semantics had acquired the expertise of information professionals.

In this paper the case of the curriculum reform of the Department of Archives, Library and information Studies of the University of West Attica is presented and the specific interrelationship of the Horizon2020 Project "CrossCult" [2] in which the aforementioned Department participated, is viewed as a parameter for shaping a cluster of courses within its curriculum.

Index Terms — LIS Studies, Culture Heritage, Information Management, Academic program.

I. INTRODUCTION

Today's Library and Information Science (LIS) education includes the traditional studies of library, archives and museum at the basis of their information characteristics and the use of informatics as a medium in performing their functions, processes and provision of their services. The broader aspect of information management finds a most applicable domain within these organizations both as memory institutions as well as providers of information services to the community.

As a whole the allocation, organization, processing, preservation, retrieval and distribution of information are key elements of information organizations focusing on managing information itself, independently of the substrate that it is written or depicted upon.

In LIS education, this approach has shaped interdisciplinary curricula combining the above-mentioned domains including the management not only of information but of the organizations themselves, the relevant technologies and the continuous development of informational technical tools and media. Furthermore, the impact of technologies on the shaping of information infrastructure and media of dissemination along with the emerging socio-economic fabric is also considered. As a result, LIS curriculum is designed to meet scientific, cultural, managerial and business information. Our curriculum (Department of Archives, Library and information Studies of the University of West Attica[3]) at its undergraduate level comprises 6 interrelated modules. Three of them relate to the core subjects of **Library Science**, **Archival studies** and **Museum and Cultural Heritage studies** interconnected and supported by a central common subject, this being information science. In addition, two more subject areas are also supported, those of new technologies and humanities, to provide to our students' elements of digital humanities and a sense of the emerging cultural information management. To the latter, the department's participation

[2] CrossCult: "Empowering reuse of digital cultural heritage in context-aware crosscuts of European history", website: https://www.crosscult.eu/en/about/background/ (Horizon 2020).

[3] Department of Archives, Library and information Studies of the University of West Attica, see http://www.alis.uniwa.gr

in the European Union funded project "CrossCult" within the framework of Horizon2020, had a most interesting impact that led us to take several things into account, as it will be described further below.

The aim of the curriculum is to create professionals that will be able to respond to the market's demands and become competitive to the European and international information world. In the new digital environment, a LIS graduate should be able to act as an information professional, as a repository creator and manager, as an information systems expert, as an information advisor and as a high-tech business information executive.

II. CONCEPTUAL FRAMEWORK – INTERNATIONAL STATUS

Library and Information Science today is the combination of different scientific approaches in knowledge organization and retrieval using new technologies and within the broader framework of the social sciences. In the European and North American spectrum, Library Science curricula can be found in different faculties, such as social sciences, humanities, informatics, communication studies, management etc. or as independent information faculties (such as the known "i-schools"). In 26 European countries there are 194 undergraduate library studies departments and 220 graduate LIS programs [1] (**Borrego, 2015**). Their North American counterparts – in the United States and Canada are the ones that have the longest tradition and today their curricula do manifest the common ground of information organizations (libraries, archives and museums) and incorporate relevant courses. Some of these curricula do identify streams within their programs acknowledging the informational interrelationship of the aforementioned organizations and emphasizing the common platform that new technologies are creating for the handling of their information.

European library schools have, in their majority, incorporated information science and the teaching of new technologies in library applications. Curricula such as those of City University of London[4] in the United Kingdom and the Royal School of Library and Information Science[5] in Denmark place an emphasis on computer applications and at the same time are retaining the social and cultural aspect of libraries with relevant courses from the social sciences and the humanities. The Department of Libraries, Archives and Museums of Uppsala University in Sweden regards all information organizations as an interwoven web of information independently of its format. Our curriculum integrates this latter approach, treating libraries, archives and museums within the information cycle and using technology as the vehicle for providing access, organizing and disseminating information.

Furthermore, it must be mentioned that other approaches to information science, either as a whole or to its components can be found within the European setting, depending on national traditions and historical derivations. Best example of this is the Department of Historical Information Science nested within the Faculty of History in Moscow Lomonosov University[6], fully attaching archives as part of the study of history and less within the concept of records management and the information world. Similarly, in France the Ecole National des Chartes (National School of Paleography and Archival Studies)[7] focuses on archives as a manifestation of the historical past and less as information organizations that need to be managed and play a role in the ever-evolving information world.

At the other side of the Atlantic, Library and Information Science schools of North America tend to treat information science as a central corpus within a common framework focusing on information and society, the impact of technology and the continuous changes brought about in information organizations. Specifically, both "i-schools" of Illinois University [8] and North Carolina University [9] offer streams on Library and Archival Studies based on a common base of courses on information science. Relative to that is the program offered by the University of Toronto [10] "i-school". It should be mentioned that the latter is offering a specialization degree in museum studies apart from the library studies and the information science one. Furthermore, the "i-school" of the University of British Columbia [11] offers one more specialization in Archival studies.

At the same time, looking at the international environment of research related to libraries, archives and museums, one can conclude that is focusing on semantics and their use in enhancing subject approach to information and content exploitation, also on the new trends and roles for libraries in an ever-changing environment and the emergence of museums as information organizations open to new technologies. The latter within the established

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[4] City University of London - https://www.city.ac.uk/department-library-information-science

[5] Royal School of Library and Information Science - http://iva.ku.dk/english/

[6] Dept of Historical Information Science - http://www.hist.msu.ru/English/departments/index.htm

[7] Ecole nationale des Chartes - http://www.portahistorica.eu/organisation/members/ecole-national-des-chartes

[8] School of Information Science- University of Illinois https://ischool.illinois.edu/degrees-programs

[9] University of North Carolina - https://www.unc.edu/school/information-library-science/

[10] University of Toronto - https://ischool.utoronto.ca/

[11] University of British Columbia, https://slais.ubc.ca/

approach that museums are now resuming a clearly educational and entertainment role, elements that have shaped funded and individual research. In addition, serious games, semantics and ontologies and the use of social media are but a few of the emerging areas of research and study.

Projects such as "CrossCult", EMOTIVE, INCEPTION, Wholodance, Archaide, GIFT, etc. have directed research in the area of technologies, the development of new high-tech tools for describing, organizing, using, re-using and promoting cultural content. If we look closely at the projects' focus areas, we can see the emerging needs of museums and their interconnection to information science along with a strong emphasis in the use of media technologies for modernizing and enhancing visitor experience. It is worth looking more closely to a couple of these projects leading research and shaping the future demands of cultural organizations.

The "CrossCult" project is an EU funded project aiming at creating a multi-level, cross-repository and cross-venue connections using new technologies for smart venues and cities. Personalized and context-aware experiences are part of "CrossCult's" objectives. This project main aim is to promote interpretation of historical events and invoke reflection of the past to present. Hence, four different pilots are implemented across European countries and cultural heritage venues. The pilots are realised under a common platform with the development of innovative tools and technologies that would realize the challenge of interpreting and reflecting on history.

Furthermore, EMOTIVE [12] is also an EU-funded heritage project that aims to use emotional storytelling to dramatically change how we experience heritage sites and it is chiefly addressed to cultural heritage information professionals. Along, the same lines INCEPTION [13] realizes innovation in 3D modelling of cultural heritage through an inclusive approach for time-dynamic 3D reconstruction of artefacts, built and social environments.

It is quite evident that research is drawing from both high-tech applications as well as digital humanities. For heritage professionals, this is not only the future but the means to present their holdings, to promote the wealth of information that they have and to interconnect with the other memory organizations, namely libraries and archives. It is also evident that research for the implementation of the aforementioned projects drew from metadata applications and information handling of the traditional library and information world.

In summarizing, it should be mentioned that curricula of library and information science departments, archival and museum studies departments along with current research and trends were considered in shaping the curriculum of our department. The emerging role of libraries in relation to the new substrate of written and /or depicted information and the need to respond to the demands of the work environment along with the major factors shaping our job market have influenced the shaping of our LIS program. Digital libraries, digital archives and digital museums became a major element in our curriculum and information organizations were viewed within the emerging new digital environment?

III. NEW LIS CURRICULUM

This new curriculum has been in effect since September 2018. Two previous major reforms occurred in 2008 and 2015 accordingly and have prepared and formed the infrastructure for this latest reform. The new LIS curriculum aims at the formation of a contemporary profile, abiding to international standards and educational programs, while keeping up to date, with the latest scientific developments. The main objective of the program is to educate new graduates and offer them the necessary skills to manage information content, independent of the medium or the working environment context.

The upcoming sections provide useful insights about the structure, the philosophy and the aims of the new LIS curriculum, as well as details on how it integrates the skillset required for museum and cultural heritage information management in the educational process.

Curriculum structure

The new LIS curriculum structure is comprised of four main and two supportive course modules that aim to cover all library and information science topics focusing on both theoretical and practical aspects (see Figure 1). In particular, (i) the Information Management Common Courses (**IMC**) provide the ground base knowledge and act as the interconnecting layer for the three disciplines that the LIS curriculum offers, (ii) the Library Studies Courses (**LSC**), (iii) the Archival Studies Courses (**ASC**) and (iv) the Museum and Cultural Heritage Information Management Studies Courses (**MCHIMSC**). The total number of courses that these four main modules offer to the students is **33** and correspond to the **71%** of the total curriculum. Apart from the Information Science core topics, the new LIS curriculum provides two more course modules that aim to improve both undergraduate students' technology and social science skills. More specifically, (v) the Social Science and General Education Courses (**SSGEC**) contribute to the better understanding of the social framework within which information organizations operate, using a variety of methods and scientific approaches, in topics such as economics, management, history and political sciences. On the other hand (vi) the Information and Communication

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Technology Courses (**ICTC**) are necessary for building skills that relate to computer science such as programming, data structures, database management and internet technologies. The number of courses that SSGEC and ICTC packs offer are **13** (**29%** of the total curriculum).
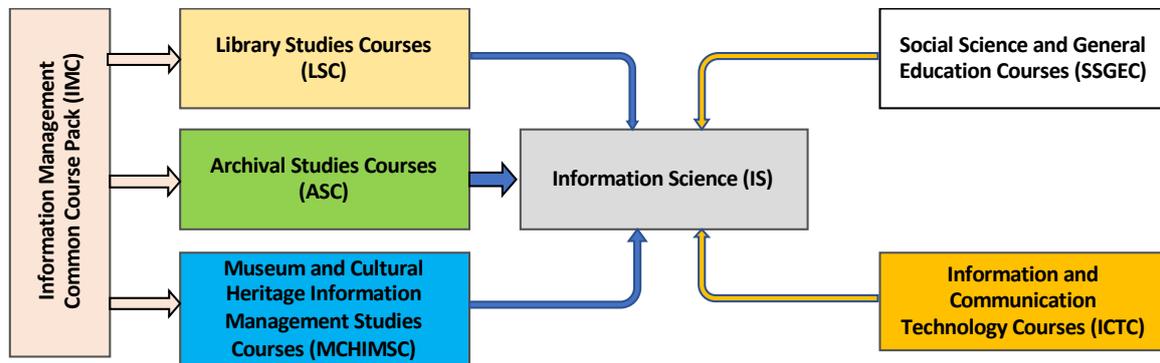
Figure 1. New LIS course packs

The new LIS curriculum sets as a prerequisite for the undergraduate students to follow an internship work experience course, at the final year of their studies, which lasts at least three months [2] (***Guidelines for Student Internships*, 2015**). Internship students work in information management related organizations, such as libraries, archives, museums or other governmental agencies, as well as in business sector locally or aboard [3] (**Južnič and Pymm, 2016**), resulting in an important learning opportunity, through their direct involvement at the work environment operations. At the end of the internship course, students ought to produce a report about their experiences demonstrating how they have addressed specific learning goals. Finally, students that attend the new LIS curriculum must complete an undergradute thesis, under the supervision of a faculty member. The undergraduate thesis offers students the opportunity to perform research on a single subject, in greater depth than a simple course assignment.

Table 1 presents the details of the new LIS curriculum that was adopted after the last reform done by the Department of Archives, Library and information Studies of the University of West Attica in 2018. Specifically, the number of courses, the weekly hours for lectures and laboratory classes and the ECT [14] credits (European Credit Transfer and Accumulation System) per course module are given. It is evident that the work load for the undergraduate students is well balanced among the three main disciplines (Library studies, Archival studies and Museum and Cultural Management studies) of the new LIS curriculum, in terms of number of courses, total hours and ECTS (see also Figure 2). Also, the ratio between lectures and laboratory classes is 4 to 1 which is a positive feature as students always prefer the laboratory classes (active and hands-on learning) instead of lectures (passive learning).

Table 1. New LIS curriculum details: Number of courses, hours (lectures and laboratory part) and ECTS per courses pack

	Number	%	Hours (lectures)	%	Hours (Lab. part)	%	Hours (total)	%	ECTS	%
Social Science and General Education Courses (SSGEC)	7	15%	17	14%	0	0%	17	11%	31	13%
Information and Communication Technology Courses (ICTC)	6	13%	15	12%	12	38%	27	18%	37	15%
Archival Studies Courses (ASC)	7	15%	20	16%	4	13%	24	16%	37	15%
Library Studies Courses (LSC)	8	17%	20	16%	4	13%	24	16%	41	17%
Museum and Cultural Heritage Information Management Studies Courses (MCHIMSC)	7	15%	20	16%	0	0%	20	13%	36	15%

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[14] ECTS is a credit system designed to make it easier for students to move between different countries. For more details see Education and Training at https://ec.europa.eu/education/resources-and-tools/european-credit-transfer-and-accumulation-system-ects_en

Information Management Common Courses (IMC)	11	24%	30	25%	12	38%	42	27%	62	25%
Total	46		122		32		154		244	
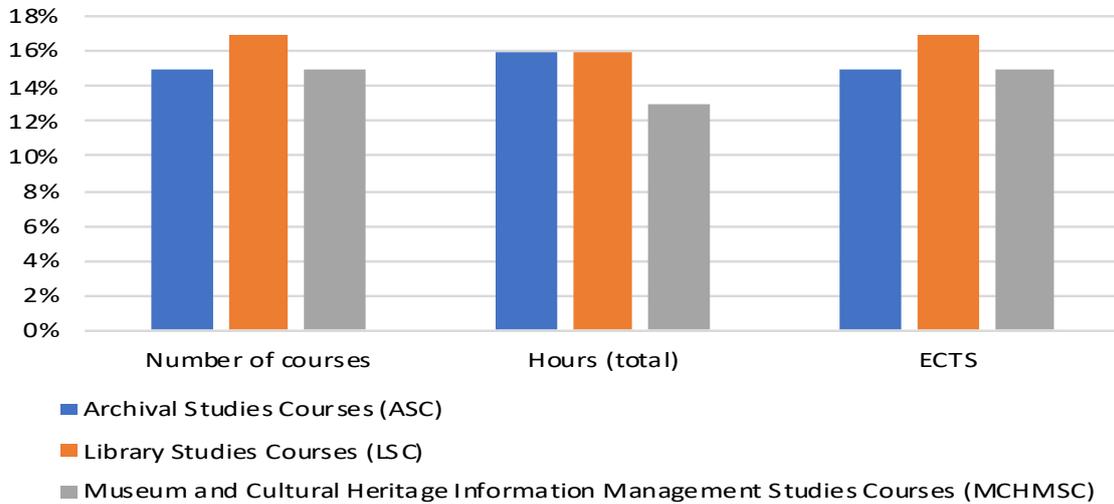
Figure 2. Comparison of new LIS curriculum three main disciplines (number of courses, hours, ECTS)

It must be mentioned that there has been a considerable shift towards museums and cultural information management courses over the latest reforms. In order to quantify this new LIS curriculum gradual shift towards museums and cultural heritage information management that took place after its latest reform, we provide Table 2. This was mainly done as a result to address the market and the research community demands for information professionals with skillsets among which most notably are metadata and semantics management in the related topics. Table 2 provides comparison data between the two previous reforms (2008-2014, 2015-2017) and the current version of undergraduate program (see end of the paper).

Table 2. New LIS curriculum vs LIS curriculum (2015-2017) vs LIS curriculum (2008-2014)

	New ILS Curriculum		Previous ILS Curriculum (2015)		Previous ILS Curriculum (2008)	
	Number	**%**	**Number**	**%**	**Number**	**%**
Social Science and General Education Courses (SSGEC)	7	15%	11	25%	14	32%
Information and Communication Technology Courses (ICTC)	6	13%	7	16%	7	16%
Archival Studies Courses (ASC)	7	15%	5	11%	5	11%
Library Studies Courses (LSC)	8	17%	6	14%	6	14%
Museum and Cultural Heritage Information Management Studies Courses (MCHIMSC)	**7**	**15%**	**2**	**5%**	**0**	**0%**
Information Management Common Courses (IMC)	11	24%	13	30%	12	27%
Total	46		44		44	

As expected, the number of courses that relate to the Museum and Cultural Heritage Information Management Studies was tripled (increased from 5% of the total number of courses to 15%) after the last curriculum reform. Note that the 2008 curriculum did not include any courses related to Museum and Cultural Heritage Information Management. However, in order to keep the students' workload balanced, a significant part of the Social Science and General Education courses were either eliminated or merged.

Curriculum philosophy and aims
The philosophy behind the reform of our LIS curriculum is to ensure high quality educational services which are up to

date, with the latest scientific developments and aligned to the job market demands. Curriculum reforms are considered to be an important academic process and may result in useful discussions among not only academics but also market representatives and experts. During curriculum change, aspects such as *'political (the culture of a university), philosophical (the nature of the discipline), and educational (professional practice)'* should be considered [4] (**Pegg, 2014**). From our perspective, the following requirements were set before the reform process started:

- Undergraduate students and their education are in the spotlight.
- The reform should keep continuity and be linked to previous curriculum versions and should retain the complementarity between the disciplines of LIS studies.
- The curriculum should be compatible with the rest of LIS programs in Europe and North America.

- New Information Professionals (**NIPs**) [5, 6] (**Jantz, 2016; Myburgh, 2005**) that follow the new LIS curriculum should be able to meet workforce competences and job market requirements at national and international level.
- The curriculum should reinforce its interdisciplinarity, Information Technology (IT) constituents and be up to date with the contemporary research topics.
- The structure and the content formation should be compatible with national and international standards and requirements that will assure accreditation.

Table 3 presents an indicative list of skills that undergraduate students develop during their studies, following the new LIS curriculum, and skills that will utilize as New Information Professionals [6,7,8] (**Nonthacumjane, 2011; Missingham, 2006; Elings, Choi and Zhang, 2014**).

Table 3. New Information Professionals skills that the new LIS curriculum put emphasis on

Generic skills [Social Science and General Education Courses (SSGEC) Information and Communication Technology Courses (ICTC)]	
Personal skills	Analytical, creative, flexible, adaptable, self-motivated, critical thinking, problem solving, leadership
Outreach skills	Information literacy, communication, teamwork, ethical and social responsibility, marketing, presentation, social media management
Management skills	Project management, people management, planning and evaluation, bids and proposals, strategic management, financial skills, service development, copyright law, academic and research ethics, etc.
IT skills	information systems design, application design, user support, database management, digital libraries, coding/programming, data visualization, information retrieval systems, mobile applications, digital preservation etc.
Information Science skills and per discipline specific skills	
Information Science studies	information architecture – organization – management – representation – access – seeking – integrated services, knowledge management,
Library studies	documentation, classification, subject expertise, metadata, collection management, education and research processes support (information literacy education), Library Service Platforms, Scholarly Communication, Scholarly Publishing, Open Access, Research Data Management etc.
Archival studies	archival metadata formats, record management, archive collection management, organizational structure analysis, Archival Information Systems
Museum and Cultural Heritage Information Management studies	cultural institutions collections, resource management, digital curation, museum and cultural collections metadata, museum collection management, history of art, history and theory of cultural heritage institutions etc.

As it can be seen from the above set of skills, supported by the new LIS curriculum, the Museum and Cultural Heritage Information Management topic is present and well balanced in relation to the other two major disciplines (Library and Archive studies). In addressing the new educational requirements, imposed by research and market shift towards cultural heritage information management, the new curriculum offers courses in special collections and archives management, preservation (both

analog and digital), art and museum librarianship etc. All of the above are in addition to the core Information Science courses.

IV. CROSSCULT PROJECT IMPACT ON THE NEW LIS CURRICULUM

As already has been mentioned, a curriculum is not built in vacuum but rather it is a result of the emergence of scientific developments, research trends, market demands,

technology developments etc. The Departments participation in the project CrossCult was one of the factors that have shaped the curriculum. The projects demands have in many ways indicated the areas that our graduates were most likely to participate in research and/or acquire new jobs.

The objectives and aims of the European project "CrossCult" were set to be the following: (a) to develop pilot experiences gaining insight into the research question: "*How the same facts may be interpreted differently from different social realities and by individuals with different cognitive/emotional profiles (meta-history)?*" (focus on the interpretation of information, its accessibility and content elements), (b) to create a semantic knowledge base that interrelates an unrestricted set of (existing and future) digital cultural heritage resources and venues across different repositories, on the grounds of common properties or crosscutting, transversal concepts (metadata focus, ontologies and semantics of information), (c) to assess the impact of state-of-the-art technologies of geolocalization, micro-augmentations of reality, social networking, content adaptation and personalization in mobile edutainment apps for smart cities and smart venues, (uses of personalized information, geospatial information, cultural heritage

information, database structures) (d) to automate the generation of narratives and the composition of digital cultural heritage resources in order to deliver meaningful interactive experiences to individuals and groups, taking into account their cognitive/emotional profiles, as well as temporal, spatial and miscellaneous features of context (user studies and user profiles, information handling and information dissemination) and (e) to design business models and plans for the exploitation of the project results in collaboration with a new network of researchers, scholars, ICT professionals and specialists of digital heritage (information exploitation, information organizations).

Among other activities, CrossCult project has developed four (4) innovative pilots (see Table 4), to acquire proofs on the methodological approach credibility and to validate the outcomes putting the aforementioned objectives into real life activities and testing applications and methods along with knowledge demands and skills. This has helped the LIS team to evaluate curriculum needs in practice and assess the demands for skillsets and real-life implementations. Table 4 is indicative of those requirements, venues involved and their informational nature along with their use in the digital information world that shapes today's memory institutions.

Table 4. CrossCult flagship pilots

Pilot category	Implementation details
Pilot 1 - Large multi-thematic venue	The broad collection of the **National Gallery**, London (**UK**), is used to illustrate the **connections** among **people**, **places** and **events** across European history.
Pilot 2 - Many small venues	**Spanish**, **Portuguese**, **Italian** and **Greek small venues**, respectively the Roman healing spas of Lugo and Chaves, the Archaeological site of Aquae Tauri and the ancient theatre of Epidaurus are connected in the pilot. It will highlight the inherently cross-border nature of History by engaging people of multiple nationalities in the discovery of connections between their respective bodies of cultural heritage.
Pilot 3 - One venue, non-typical transversal connections	In the **Archaeological Museum** of Tripolis in **Greece**, visitors will go beyond the typical level of history presentation (e.g. type of a statue, or its construction date), into deeper levels of reflection, over social aspects of life in antiquity, power structures, etc.
Pilot 4 - Multiple cities, "Past & Present" interplay	Outdoors in **Luxembourg** and **Malta**, more precisely in Luxembourg City and Valetta, this pilot challenges the visitors' **current perceptions on migration** as a contemporary emotive topic and engages people in exploring the past to understand the present.

Pilots were implemented around sites with significant cultural importance, across the continent of Europe, where, participants faced different types of questions, looked at past and present societies with a critical mind, and evaluated major events and characters on the grounds of economic, political, cultural and environmental realities. To achieve these have used information deriving across from artefacts, archival resources and bibliographic information, geographic resources, current web

information, newly produced experiential information, stories and games.

Based on the above description, the figure that follows indicates certain key concepts of CrossCult project (blue circles) and how the new LIS curriculum (red circles) corresponds to prepare **NIPs** who are ready to participate in research activities/projects (e.g. CrossCult) and to implement new cultural heritage information management services in related organizations.
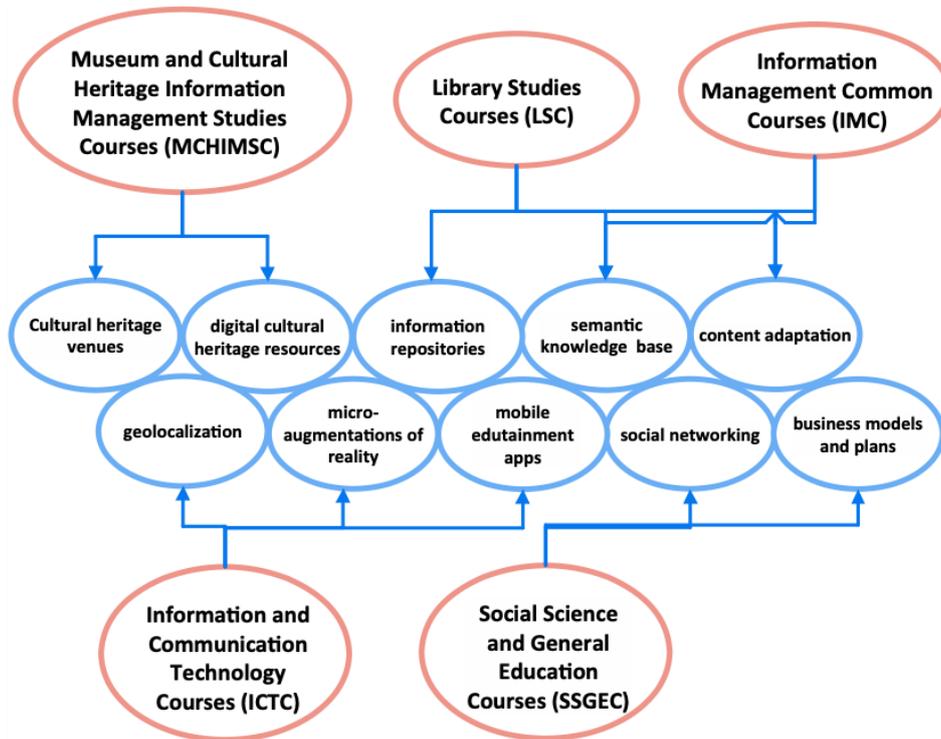
Figure 3. CrossCult project – New LIS curriculum interconnections

V. Discussion - Conclusions

Today's LIS Curriculum is a cross disciplinary curriculum. It incorporates the traditional library, archives and museum courses based on the common platform of information technologies and their informational character. Dealing with the emerging of new media technologies and the new substrate of digital information that is transforming rapidly all memory institutions is looking at the future of these organizations within the new environment and is acquiring new areas of expansion. To our curriculum, memory-information organizations are an interrelated web of human knowledge and are treated equally as such. This is regaining the wholeness of information independently of its origin or place of storage. It focuses on its organization and semantic value and the technologies used to acquire, disseminating and handling it, rather than creating sets of courses and rules within specific library environments. New trends of research in the areas of the use and re-use of information within the social settings and needs of cross-cultural populations, new socio-economic conditions that demand re-interpretation of history and the flexible use of information outside of sets and rules are reflected in the curriculum.

The emerging new market for information professionals is also a major element in shaping the curriculum. The demand for independent information professionals that can both create the settings of information handling as well as the actual processes and the dissemination of information has well indicated the required skills and knowledge of applications within the European and international market. Our new graduates- information professionals are competent enough to provide services within any kind of information organization and can merge and incorporate information as a whole. Whilst, in previous curriculum reforms library, archival work, records management and business information were mostly present, we have come to the point to incorporate museum and artefact information within the socio-economic setting of today's digital world.

Specifically, the latest curriculum reform, among other benefits, achieves to fully incorporate the cultural heritage information management special requirements through a complete set of courses, compared to the 2015 studies program (**Giannakopoulos, Manesi and Zervos; 2011**). The driving force behind the reform process was the department's active participation at national and European research projects, such as the "CrossCult". The intense research activities and the experience gained by the interaction with international information management organizations was the catalyst that led to a rapid and in-depth curriculum restructuring. As a result, our department adequately responded to the necessity to reinforce the LIS program transdisciplinary and its Information Technology (IT) constituents according to the needs of modern information organizations, by emphasizing the cultural heritage information management. The further development of the areas of use and re-use of information and the actual production of information within the

traditional library profession is among our future areas of expansion.

Finally, our next goal is to develop curricular tracks and specializations in an attempt to offer information science studies as an integrated interdisciplinary set of fields and in a sense of the evolution of the traditional fields of library science, archives and museum studies.

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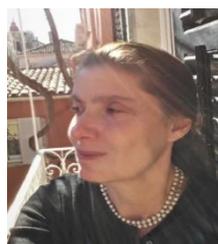
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