

# What is the purpose of a School of Library and Information Science in the 21st Century?

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## Introduction and background

Education for information professionals has been a controversial topic since its inception, and the recent rapid development of information and communication technologies (ICTs) has created more challenges. Now, any record of human activity or thought can be digitised, whether it is text, sound, video or graphics and in digital format, virtual documents can be rapidly communicated. Educators are caught in a paradoxical situation, where they must not only convey the existing knowledge of the disciplinary domain and the competencies and skills that permit its praxis, but they need to do so in consideration of the kinds of careers that students are likely to have, and the work that they may be called upon to do in the future. In addition, there is a belief that, in a global world, it should be possible to identify internationally recognised principles that are common to all information workers, and this task becomes even more complex given the very different cultural contexts from which the students in the Erasmus Mundus Master of Digital Library Learning (DILL, University of Parma) are drawn<sup>1</sup>.

It is against this backdrop that the purposes of the School of Library and Information Science (LIS) are considered. Characteristics of this context include the changing roles of information workers and how to prepare for them, the potential for internationalisation of education for digital Librarianship given the present nature and ambit of digital libraries, the tension between technology and social purpose, the uniformity of intent and principle between libraries, galleries, archives and museums as custodians of cultural heritage, social equity and internationalisation of access to resources and the possibility for professional re-invention.

This paper reports the conceptualisation of a research project which is currently underway. In particular, it articulates the problems of developing a curriculum for neophyte digital librarians, on an international basis, by examining a group of international students currently completing this Master in Digital Library Learning. This work has been based on an extensive literature review, participant observation of groups of international students in DILL, and interviews with these groups over a period of four years, as well as the analysis of aspects of the curricula that appear to attract higher achieving graduate students. Based on these findings, we propose what we consider to be the necessary elements of theory and praxis that should appear in a course of instruction for the librarians of the future, in order to equip them to deal with the constant change in this field.

## What are the values underlying the concept of library in contemporary times?

A review of changing information needs should be performed to consider both traditional and emerging roles for information workers, as new working environments and new societal demands would suggest. Since online bibliographic databases first appeared in the 1960s, librarians have, on one hand, used Information and communication technologies (ICTs) in their work, while, on

the other, they have feared the demise of the discipline / profession precisely because of ICTs – a view that is usually emphasised by non-librarians. It is true to say that librarians' embrace of ICTs has predominantly concentrated on their use to support, and sometimes expand, their existing roles and practices, but in so doing, librarians have shown themselves to be « the same, but different » – ongoing in the face of change, and able to absorb such change. But even though the sentiment « the future of libraries is being shaped by emerging technology » is often heard, the actual impact of ICTs on libraries is poorly researched, and evidence is largely anecdotal and practical: there are few reflective examinations of this phenomenon. Defensively, librarians tell each other that they have the unique and necessary skills to play an important social role in the so-called Information Society, but others have yet to be convinced of their proficiency or relevance. For example, there is a communication gap in the sharing of research results between LIS and Computer scientists. This lack of communication leads to misunderstandings – which are supported by the lack of librarians' involvement in counteracting the commodification and commercialisation of information which occurs outside their arena. We feel that this is largely the result of an inappropriate education for the discipline / profession.

In one sense, this diffuse, locally and universally accessible « library » of information resources that is represented by Internet is understood to be desirable because it is another technology able to overcome spatio-temporal constraints (much as information recorded in documents did for speech). From another point of view, however, the library, its resources and personnel could evaporate into the ether if they can be so easily replaced by ICTs. The work of information professionals has modified to meet technological demands and this adjustment has focused primarily on the necessity to acquire technical skills, without much understanding of the degree to which the technical is the technological : technologies complete with their own preferred set of social practices and values. The technical must be supported by the theoretical in work described as professional, as T. Parsons argues : there is a « requirement of formal technical training... giving prominence to an intellectual component » : the development of « skills in some form of its use » ; and the « socially responsible uses » of the profession<sup>2</sup>. Other writers such as Thomson have deplored the development of a profession that has taken place in a « philosophical vacuum », and he emphasises that “what a library is, what roles it should play and what a librarian should aim to be” should receive more attention<sup>3</sup>.

This argument is becoming more pronounced, particularly within the community of information professionals engaged in digitisation projects. In the 2008 issue of the *Digital Document Quarterly*, H. M. Gladney has written a piece entitled « Information Science and scholarly writing: a short life for Information Science (IS) », in which he states :

IS [Information Science] participants seem not to have identified a unique theoretical base. The fundamentals of IS are epistemology and philosophy of language, which continue to be the purview of departments of Philosophy. Furthermore, most of what might be the IS practical side is handled by software engineers and departments of Computer science. What's left is little more than 60-year-old library management topics – what used to be taught in a « Library School » – with relatively obvious extensions for digital holdings<sup>4</sup>.

He further believes that as far as digitisation is concerned, « research libraries are trying to handle a challenge that seems to be beyond the skills of most of them »<sup>5</sup>. He refers to a previous article on the same topic, in which he explored the distinctions or relationships between knowledge and information, referring to Zins' work<sup>6</sup>, and, while recognizing that digital preservation seem to be

an almost exclusive concern of information scientists, he draws the conclusion that « so-called Information Science » seems to him to be a « passing enthusiasm »<sup>7</sup>. His reasons for this statement are two-fold : information scientists do not engage with literature outside of their knowledge domain, and computer scientists and software engineers do not « seem to pay much attention to the literature of Information Science »<sup>8</sup>.

It is clear that the study of digitization (be it digital curation, digital preservation, cyberinfrastructure or e-research) is substantially occupied with the technologies that facilitate these developments. The lack of understanding of the knowledge domain shown by H. M. Gladney (and, sadly, some others involved in LIS), the emphasis on technologies and the subsequent overwhelming influence of computer scientists and software engineers are potentially dangerous.

### **Digital libraries**

Digital libraries may be seen as running parallel to the existing commercial services in a de-centred and global information infrastructure. However, exactly what a digital library is, and what its societal role may be, still remains undecided and contested, and therefore open. Sometimes a database is described as a digital library : other definitions are broader. In 2003, the Digital Library Federation suggested that :

Digital libraries are organisations that provide the resources, including the specialized staff, to select, structure, offer intellectual access to, interpret, distribute, preserve the integrity of, and ensure the persistence over time of collections of digital works<sup>9</sup>.

The emphasis here appears to be on the production and preservation of digital documents in order to increase access, and to preserve these documents in particular ways. This approach does not mark any significant departure from standard library practice, which for many years has regarded information as synonymous with documents, and thus emphasised the management of documents as physical objects. Now, even though documents may be digital, LIS processes remain inviolate, the emphasis remains on access (rather than successful interpretation and use of information) and the information professional remains passive, having not made any new attempt to understand the user community nor customise service and delivery. The user must still negotiate whatever interface is provided by the system in order to identify, locate and retrieve the desired information.

Gladney's association of Information Science with document digitization is probably inevitable, but nonetheless interesting, particularly in light of the definition offered by the American Society of Information Science (as it was then known) in 1975 :

Information Science is concerned with the generation, collection, organisation, interpretation, storage, retrieval, dissemination, transformation and use of information, with particular emphasis on the applications of modern technologies in these areas.

As B. Hjørland points out, « The ASIS definition indicates that IS was born with the intention to contribute to the automation of processes in some specific areas such as libraries and bibliographical services »<sup>10</sup>. He continues :

The application of the most adequate tools and modern technology to a given purpose should be taken for granted in all areas (including education, medicine, libraries and

scientific communication). Just as we cannot think of two medical sciences, one technology oriented and one non-technology oriented, we cannot (or should not) think of two « Library Sciences », one technology oriented and one non-technology oriented. A science must be defined by its object, not by its tools<sup>11</sup>.

If, therefore, a digital library is to be distinguished from any other expression of the LIS knowledge domain simply by virtue of being a result of the application of technology, it becomes difficult to justify Digital Librarianship as a body of knowledge and practice in its own right, just as it could be argued that there is no difference between Digital Librarianship and Information Science. But there is little desire to detach Digital Librarianship from the body of Librarianship, or Library and Information Science as a whole, as the terminology would indicate.

The lack of differentiation between Digital Librarianship and any other type of Librarianship is clear in Deanna Marcum's view of digital libraries, whether intended or not. After expressing a considerable degree of enthusiasm for the supposed increased accessibility of digital libraries, she notes :

To achieve such a goal, I believe that the digital library of the future will develop three overall characteristics :

- It will be a comprehensive collection of resources important for scholarship, teaching, and learning ;
- It will be readily accessible to all types of users, novices as well as the experienced ;
- It will be managed and maintained by professionals who see their role as stewards of the intellectual and cultural heritages of the world<sup>12</sup>.

We do not understand this to indicate a fundamental transformation of the enterprises we now call libraries, particularly with their emphasis on documents as objects, rather than the information content they contain. This rather traditional understanding is repeated by B. Leiner, who states that « The basis for a digital library must be the information objects that provide the content »<sup>13</sup>.

### **What is the purpose of the LIS schools?**

By asking « What is the purpose of the LIS schools ? », one needs to ask : « What is a library ? » and « What is the role of a library in a community ? » as the answer to the latter question will formulate the philosophy for the former. This, in a sense, summarises the present challenges to LIS education, which must provide an education suitable for the future professionals in a field which features major change and rapid evolution, but which continues an ancient tradition. The practitioners, the collections of documents they manage, and the programs that educate them, are considered by some to be obsolete, or at the very least are understood to be increasingly redundant because of ICTs. The complex process of internationalising the LIS curriculum is related not only to what we teach and how we teach, but also to the implications of value judgements.

The reply to these questions is implicit in the values that the LIS schools transmit to professionals.

First of all, such values are expressed in what is agreed to be the core of the profession, but what is the core that distinguishes the profession? This core ought not alter over time, but rather adapt to the changing circumstances while remaining substantially unchanged, so as to be of permanent value in time and space. Happily, all the European LIS schools involved in the EUCLID project agreed on this core role :

All information professionals have to organise collections, both physical and/or virtual. Their role is that of mediator between authors and users<sup>14</sup>.

Other roles, such as librarians being educators or playing a role in social upliftment, were debated during the discussion of the EUCLID project, but no further agreement was reached. The organisation of knowledge is part of the professional core as it enables the rapid retrieval of documents and, thus, the information they contain.

The authors have no intention of engaging here in the debate concerning the nature of or differences between Librarianship and Information Science, except to express the view that they believe that LIS is a valid, definable knowledge domain with an authentic social integrity which is enacted by digital libraries, and can therefore be described as a discipline / profession. As such, it has a particular social obligation, and specific ways of materializing the theory into praxis, in order to discharge its social responsibilities. These professional aspects are, it is argued here, quickly forgotten when considering how education for the field must accommodate technological developments, which so clearly and intimately change the nature of documents and the ways in which they can be disseminated.

### **Defining one's terms**

Conceptual clarity is essential in a discussion of this kind, as the terms used to suggest various concepts can carry ideological connotations if they are considered as part of what Wittgenstein described as language games. Wittgenstein understood his language games as sets of legitimate linguistic moves agreed to by a particular community. For Wittgenstein, the rules of a language game are understood by individuals within a discursive and institutional context, and they are then able to construct and share meanings within a particular context, enabling a particular reality to be understood. Language use therefore can construct reality or particular versions of an experienced world, positioning the participant to subscribe to particular beliefs, where some truths are accepted and others rejected.

Some of the terms are briefly examined here include information, digital curation, digital preservation, and cultural heritage. The authors are guided by the following understanding of the term information :

Information is that part of knowledge that is selected for communication by an individual, and which is represented in some shared symbolic cultural code<sup>15</sup>.

Some information can be recorded (or captured) on a range of materials (including as sequences of electronic impulses) and recorded information can be said, therefore, to be contained in a document of some kind. In this way, ideas and evidence of human activity and expression can exist and be interpreted over space and time. In principle, librarians, archivists, gallery curators and museologists all share at least one objective : that of preserving at least a selection of such records (which may be physical objects, books or digital files) for posterity. This activity can be called « curation ». The Digital Curation Centre in the United Kingdom suggests the following :

Digital curation, broadly interpreted, is about maintaining and adding value to a trusted body of digital information for current and future use... The term digital curation is used in this call for the actions needed to maintain digital research data and other digital materials over their entire life-cycle and over time for current and future generations of users. Implicit in this definition are the processes of digital archiving and preservation but it also includes all the processes needed for good data creation

and management, and the capacity to add value to data to generate new sources of information and knowledge<sup>16</sup>.

The mention once again of « preservation » is interesting, as digitization is increasingly understood to be a form of preservation, albeit fraught and uncertain. In fact, « digital preservation » seems almost to be a contradiction in terms, even though preservation remains, obviously, an important aspect of curation.

The information metacommunity mentioned above has a mutual interest in cultural, historical, economic, political, social and technological contexts and issues. Curation is often understood to be the preservation of cultural heritage, in particular. Many definitions of heritage and cultural heritage exist, and the terms can be seen to include connotations of birthright and privilege, as well as the history, traditions and customs of particular communities, which are preserved so that their interpretation can elucidate not only times past, but also the future.

In the project *European Curriculum Reflections*, digitisation of cultural heritage refers to « the dynamic and evolving interdisciplinary domain that encompasses philosophical, social, cultural, economic and managerial aspects and consequences of management of cultural heritage in the technological environment and foresees the convergence between Library, Archives, Museums (LAM) and Computer Science »<sup>17</sup>. The cultural institutions share the traditional role of guarantors of the quality of resources, the continuity of digital resources over time and the tenability of access. The convergence of libraries, archives and museums suggest their shared goal of education : to help people learn, to be active citizens, and to create new knowledge. The LAM services are :

- Providing access to digital resources ;
- Actively promoting their services ;
- Providing assistance ;
- And education<sup>18</sup>.

The convergence of cultural institutions may, in the future, provide seamless access to all types of information contained within LAM collections, without limits of format or geography, without spatial or temporal restriction, thus enabling the provision of the broadest and most complete service possible to the client. This would be the fruit of a dynamic, network-enabled collaboration within the LAM community. The challenge of LAMs is the integration at the network level, and identifying the means to connect systems and digital collections. This can possibly include :

- the exchange between LAMs of raw data, formats, learning resources and materials, and flow of cultural material among LAMs ;
- exchange of expertise and knowledge within the LAM professional community ;
- coordination of technology research, planning and system development and deployment.

The problem of cultural institutions is understanding how the role of the digital library can evolve, both as an extension of services and as an innovation of such services. The role of digital libraries is not to manage centrally localised content but rather to promote the aggregation of distributed collections of multimedia documents, sensitive data, mobile information, widespread data processing services, and so on. Digital libraries simplify access to digital objects, at the same time as providing other services, such as putting people who are interested in the same research in contact with each other, and offering the possibility of the use or manipulation of retrieved information. In the *European Project Curriculum Reflections*, the learning outcomes at the master's level were considered to be the following :



Students are expected to demonstrate an in-depth knowledge of what communication of memory is. This involves an interdisciplinary approach to the concept of memory (exploiting theories of history, cultural studies, and sociology) and introduction of such terms as collective memory, social memory and cultural memory<sup>19</sup>.

These two aspects of service go together well : the first focuses on access to relevant information, while the second concentrates on the sharing and communication of information. Once a text is digitised, even the simplest search facilities will allow users to interact with and study texts in entirely new ways. Electronic media open new modes of dissemination and new ways of thinking about texts : scholars can use interactive music scores, dynamically generated maps, or other multimedia elements to communicate information in ways that are very different from text printed on a page.

If, therefore, the information professions are concerned with the curation and preservation of cultural expression, it would seem to follow that an understanding of the semiotic, semantic and cultural dimensions of documents and other cultural artefacts would be important. In addition, because of the processes of making meaning of information (and thereby creating knowledge), the relationship between knowledge creation and power as expressed by Foucault, and Castells's insight that controlling information flows is an expression of power, information professionals need to be particularly careful with the selection of information and cultural artefacts and documents, and the possible ways in which they can be understood, particularly in a changed medium or materiality. If, therefore, digital curation (or preservation) is preoccupied with the processes of digitisation and how digital objects may be created and preserved, the products and their use – indeed, the reasons why this activity is undertaken at all – become obscure.

### **Necessary components for the education of information professionals in a digitised environment**

A particular challenge of LIS education at present is the need to address the education of future professionals in a field featuring major change and rapid evolution. A review of changing needs has to be performed in relation to different traditional and emerging roles, new digital environments, and new societal and user demands. This includes the analysis of innovative aspects of the curricula that appear to attract higher achieving secondary school students. In other words, while an initial trend of the internationalisation is the harmonisation of the LIS curricula and the transparency of the minimum requisites (or what is called the core programme), an apparently opposing trend is the stimulation of excellence and innovation in the LIS curricula in Europe. LIS schools ought to have different specialisations and attract students through their optimal quality in such specialisations.

A key question concerns the role of internationalisation and its meaning for curriculum design and teaching practice. The authors suggest that digital information is worldwide and so digital librarians should be aware of the multicultural dimension of their work. While curriculum content, teaching and learning and institutional infrastructures for facilitating learning comprise the main focus of internationalisation strategies, currently there are no standards for internationalising the programme and, in general, there is little evidence of internationalisation in any LIS programmes. The Bologna Process tries to combine both harmonisation and diversity of programme, but the difficulty lies in achieving these outcomes<sup>20</sup>. Is internationalisation achieved by adaptation of course content to reflect a global perspective of our disciplines, or does it imply

the radical re-design of units in terms of content, teaching strategies, resources etc. to make them more inclusive and international ?

The focus of the DILL programme is on users, the social context, and the value that digital libraries can bring to society in assisting with information problems. The primary mission of this programme is the education of professional librarians for work in digital libraries. It may also provide alternative career paths to graduates, such as knowledge manager or digital archivist. In particular, the shared vision of a digital library is that of supporting and facilitating knowledge and learning. The purpose of international collaboration in the DILL programme is to offer an innovative course, sharing best practices and experiences between three LIS schools : Oslo University College, Tallinn University and the University of Parma.

The DILL curriculum includes some discussion of :

- How knowledge is created : research procedures as well as creative and innovative insights ;
- How knowledge may be represented (in language and other forms) and how it may be recorded (in documents of all kinds) ;
- Knowledge of various communities, and the discursive and communication activities of such communities.

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### **International dimension**

What do DILL students, after having experienced an international course, think about the international dimension of LIS education ?<sup>21</sup> The intercultural dimension is the main approach :

In my opinion, internationalisation means more than many nationalities or nations getting together, but it is the communication amongst people from different cultures, backgrounds, including in term of diverse nations.

I have sort of a view of internationalization as being multicultural and having a mental readiness to a new way of thoughts, languages, trends, cultures, etc.

However, internationalisation is not only cultural understanding but also a methodology, involving principles and criteria to be adapted to different contexts. The DILL course objective was that of providing a method for applying the concepts learned in the programme to different contexts, and some students seem to have understood this :

My view previously was more pessimistic in the sense that I thought that the world was globalized enough not to be able to perceive differences any more in theories and practices. But in this master's my vision of internationalisation changed to a more cooperative view to reinforce and attend particular or local needs according to the knowledge created collectively as human culture (SH).



Internationalization in the rapidly developing Digital Library world is very important. The situation is changing from day to day. And it's impossible to work in isolation, each of us has previous knowledge before coming to the program. We learned a lot by studying in this program and there will be continuously learning (lifelong) after completion the program (SM).

Well, most of the time things, projects and so on start with the intention or purpose to do something locally. However, it is always good to have in mind the internationalisation concept so that later you can apply that local knowledge and experience to the broader world. (SP).

But, nevertheless what we understand as internationalisation can some times be interpreted as « American way » or « European way », for developing countries especially, as they have different cultural histories and perspectives and to do internationalisation means to leave their identity.

### **International content**

One of the objectives of DILL was that of balancing library and technology competencies. A wider definition of the competencies of digital librarians included services using new technologies, which included information retrieval, accessibility and usability issues, and information architecture, all with a focus on the application and use of technologies in information lifecycle management. What are the perceptions of the DILL students ?

I have learnt the whole aspect and concept of digital libraries are even more complex than I thought before and that there are lots of possibilities (subject I).

I've learned that Librarianship spans boundaries, no matter which country that one comes from, we share common fundamental principles as information professionals (namely our role as information mediator). I've also learned that it's nice and all to have flashy technology but without the infrastructure to support it (e.g. from the basics such as reliable electricity to things like administrative or government support), there is not a good chance that it will be successfully realized (subject L).

The master's programme in DILL is really an interesting programme and it has been an exciting experience for me. I have learnt quite a number of things. They include :

- (a) I have learnt new technologies that can be adopted in a library for example the use of topic maps in knowledge organisation and the use of Greenstone in arranging / organising collections.
- (b) I have learnt the human resource approach to a digital library. How to be a manager or rather issues to do with human resource management as a librarian and more so in a digital library.
- (c) I have learnt about knowledge management which I never knew before how we can apply the skills in managing knowledge in an organization. How we can encourage the employees in organisation to contribute to the knowledge repository which is actually the asset of the organization.
- (d) Also I have learnt that users are very important in any library. We have learnt how to take user needs into account by doing usability studies and doing evaluations to determine whether the services being offered are meeting their needs and also the evaluation of the services, technology, etc. This has been quite exciting (subject N)

All topics should be applied to my home country situation. However, I found that the most urgent one is the users and usage study because our libraries are not much in use from our population. I think that more researches should be more considered on the users' point of view so that we will know why the users don't pay attention to the libraries ; and how to convince them to see the important of the libraries for their learning (lifelong learning) (subject C).

The topics about all the different kinds of digital documents and how they can be utilized in a digital library. I have learnt about the semantic web and how information architecture works, Web 2.0 and the social side of the web have been very relevant to me, especially as it was new to me. In my specific situation, however, I think the information / topics about interoperability and how to think about what a digital library really is and how it can work was important. Knowledge management also will play an important part when I am back home (subject I).

Knowledge economy, for me, is the recognition of « knowledge » as an indispensable part of an individual's, organisation's and even country's well-being and development and as a result the required investment is done to best utilize and harness this knowledge – for the good of society. This, I believe, calls for a dramatic shift in our curriculum (education), organizational set-up, composition of workforce, resource allocation (management) etc.

As an information worker, the knowledge economy will affect me in many ways. Knowledge is dynamic. I got to change. I should learn and unlearn – new and old ways. I should value my colleagues' knowledge. I should recognise contributions / active participation of my users / customers (subject K).

### **Learning and teaching**

Learning and teaching in international courses should be linked to research : this would include the research done by teachers, the research done by students and the mastering of research methods on the part of the students. As an immediate consequence of this approach to learning and teaching, we have to ask ourselves : can this teaching innovation resolve the age-old dichotomy of theory and practice ? It's also a question of definition : What is theory ? What is practice ? Theory is often understood as history, or as the consolidated opinion of authoritative sources, but not based on facts and evidence. Practice is understood as the daily activity of the individuals, not guided by theory.

DILL students should understand the process of research (which is connected to the creation of knowledge mentioned above), and should be able to evaluate and critique how knowledge is created and communicated. Students are encouraged to engage in a research project of some kind, so that they are more critical consumers of research. Students also undertake an internship in which they are able to apply theory to practice. An important DILL objective is to develop a reflective practitioner, combining research methods and achieving a balance between theory and practice.

It can be said that a « student-centred » didactic approach implies the acquisition of a set of skills comprised in reflective practice and research methods ; research methods and reflective practice must be included in international LIS courses. The various contexts feature different problems in the application of research methods. In a student-centred didactic approach, the personal

characteristics of the students acquire greater importance in relation to the results to be achieved. In particular, at an international level, certain skills ought to be stressed since they are more important than others, such as multiculturalism, international vision, and language skills.

Among other things, the three most important things I've learnt in this programme are :

- (1) Sharing and efficient communication / presentation ;
- (2) Leading and being led in the group ;
- (3) Networking and cultural exchanging.

All these I have learnt through the activities, travels, accidentally and /or deliberately from my lecturers, colleagues and other people who are not even part of the programme or were indirectly associated with this programme (subject D).

It affects our career in the sense that we need to be very critical and not to become naively part of those infrastructures, giving more importance to critical thinking, to promote services in our communities that help them to understand that global economy. But we need to assume ourselves as part of the society's thought, knowing as much as possible which are the driving forces or motivations for being an information worker in the present context and if it is possible to do something to improve or lessen a little bit its bad consequences (subject H).

## Outcomes

The DILL programme assumed the position that the education of a librarian should be designed to produce an active agent of change, and therefore it set out to equip students with skills such as reflective practice and the ability to apply research methods to his or her own work context. Learning outcomes have been represented as a paradigm shift from the traditional modes of measuring and expressing learning, characterised as input approaches (with emphasis on the number of teaching hours and the sum of resources), to be considered as output focused techniques using learning outcomes and competencies. The learning outcomes approach focuses attention on explicit and detailed statements of what students learn : the skills, understanding and abilities the course seeks to develop and then test. Ambiguities are not lacking for the learning outcomes approach as a whole, however. In practice it is not always clear what the learning outcomes subject to evaluation are, and hence it is not easy to decide how they can be measured. What competencies we would like our students have ? At the end of the DILL course students ought to possess :

- An international view ;
- The capacity for critical thinking ;
- Self-management ;
- A professional overview ;
- Familiarity with the body of knowledge of the discipline ;
- An understanding of the social role of the profession.

The DILL programme wishes its graduates to have some knowledge of the theoretical framework of the field, but we also wish to work with the students' preferences, as they often know what kind of work they will prefer doing upon graduation. One area in which these two competing approaches to learning outcomes are particularly evident is the learning of technologies in the DILL courses.

## Technological background

What outcomes should be pursued in LIS education to adapt the disciplinary background to the changes wrought by new technologies ? The technological knowledge considered necessary for the librarian is an example of how the two approaches can lead to different results in terms of learning outcomes. If the aim of university education is to train someone who is capable of applying new technologies to traditional library procedures, the result will be a library technician. If instead the aim is to train a librarian capable of understanding which problems of the profession can best be resolved through the application of technologies then the result will be an educated librarian. Some of our students commented as follows :

Slightly disagree. The challenges for librarians in the future not centre purely about technology moreover, in my opinion, it is about how librarians can adjust with the progressivity of society in terms of culture and social interaction, the question will be, « Can the library still exist as a social institution ? » Global information infrastructures involve political, economy, security and most important « Trust ». Technology is just one of main variables (subject B).

I agree that technology is a significant obstacle for librarians. However, I don't think that the librarians are not aware of the importance of technology. On the other hand, I think that some of them are very enthusiastic to get involved with technology. Nevertheless, the librarians have many roles to play ; and the technology is only a tool to make the librarians' tasks more convenient. The librarians' main responsibilities are more likely coping with users and content. They should and have to learn how to use technology to ease them in working process, but they do not have to be expertise in technology. I support the ideas of having some basic knowledge of technology for the librarians so that they are able to make mutual understanding when working with the technicians (subject C).

Digital library as organisation in terms of structure and position among other institution. Other subject what important for me is Human-Computer-Interaction (HCI). I think DLL student need to have at least a slight piece of understand of how users interact with digital library interface. The modules that already have now was not covered it (subject B).

From the technological point of view, we didn't study digitization practices. We didn't study Open Access concepts and practices, and this is quite relevant to our contexts.

More on Information Architecture (even from a critical point of view) is needed. This was touched, but not enough (subject H).

Reference courses I think is quite relevant as much of references services now is being done using technology or better saying the reference materials today have been digitized or born digital. Collection development is also a big issue, which has been covered now and then but not sufficiently. One interesting course would also be a pedagogical one, so to prepare future library educators and not intending to « produce » only librarians to fill a position at a workplace in a library. This would ennoble the world of library profession to have trained library educators (subject P).

Of course marketing in DL. We had just one guest speaker (subject F).

We had one lecture on copyright, but I think we should know more about copyright issue, digital right management and the process how to ask for permission when we want to digitize copyrighted work (subject O).

The main think what I really want is to be helpful for the society where I live, to be helpful with my knowledge, experience. I will try to apply what I have learned what I will learn in the place where I will work. This time is really challenging in my country, I really want to be involved in the processes going on for the developing new digital resources (subject M).

The agent role of the future librarians

The social responsibility of the librarians seems to be very well understood by DILL students :

I feel the role of librarians will be more important given the knowledge economy we are experiencing nowadays. The world economies are becoming more and more knowledge based and consequently the role of people responsible for structuring and organising such knowledge and ensuring its usage by the end users will become more vital.

The knowledge workers will also be responsible for facilitating knowledge sharing among users as can be seen for case of web 2.0 technologies. They will have to innovate additional services to accompany the emerging web 2.0 tools that will attract and facilitate the sharing of knowledge among users (subject A).

The Knowledge worker (Librarian) will use the web more for marketing services offered by the digital libraries for example using social networking sites and this therefore means they will be working hand in hand with web giants like Google with the common aim of letting easy access to the knowledge and information there is both on the web and in the digital libraries (subject B).

Librarians in the future will act as mentors and guidance for the user as GPS for the drivers. They try to bring clients from where they are at the point to where they want to be. Assisting not only to locate and identify the need of their information, but providing the fastest and accessible route for the client (subject C).

Considering the multimedia nature of the next generation of digital libraries requires global digital librarians to be essentially a type of specialist librarian who has to manage and organize the digital library, handle the specialized tasks of massive digitization, storage, access, digital knowledge mining, digital reference services, electronic information services, search co-ordination, and manage the archive and its access. Thus, the global digital librarian will act as guardian of the information superhighway / the universal digital library or the global digital library and acts as universal information guru (subject D).

## Conclusions

The traditional skills of Librarianship will either be transformed and / or supplemented. There is an almost magical quality associated with the « Information Revolution », as complex, distributed social and economic processes have resulted in far faster dissemination and more profound application of the technology than anyone expected. Traditional duties of librarians have already

changed significantly as a result of the wide use of ICTs. For example, current duties include those of database interface designer and consultant, electronic and virtual materials publisher, reviewer and monitor of the quality and integrity of online resources, metadata specialist, software consultant, and intellectual property and copyright advisor. The process has been compared to a viral process, teleonomic rather than teleologic, in improving primary education and reducing illiteracy<sup>22</sup>.

Teleonomy is the quality of apparent purposefulness and goal-directedness of structures and functions in living organisms that derive from their evolutionary history and adaptation for reproductive success. Teleology (greek *τελος* = end, purpose) is the philosophical study of design, purpose, directive principle, or finality in nature or humans. Current duties include those of database interface designer and consultant, electronic and virtual materials publisher, reviewer and monitor of the quality and integrity of online resources, metadata specialist, software consultant, and intellectual property and copyright advisor.

Computer science programs are concerned with the application of algorithms to digital data. Computer scientists may become knowledgeable about application areas and may collaborate with specialists in other fields, but computer science is fundamentally not interdisciplinary. Information systems programs, of the type commonly found in schools of business administration, are largely concerned with the application of computer science to a single organization's digital records. Information systems programs are somewhat broader than computer science programs because they are concerned with the management of technology, the supervision of staff, and the need to perform within an organizational context.

Library, information and documentation studies differ significantly and importantly from both computer science and from information systems programs. First, they are concerned with all forms and genres of documents, obviously including but not limited, as the other two are, to digital bits. Second, they are, or should be, concerned with what people know, need to know, want to know and how they know. Third, because this field is defined by the problem area that it addresses, rather than by a method, it cannot and should not attempt to become a discipline in the narrow traditional sense. It is not mono-disciplinary, like computer science, but draws, as needed, on a very wide range of sciences (e.g. statistics), engineering (e.g. computer science), humanities (e.g. linguistics) and social sciences (e.g. anthropology and economics). Some people like to say that it is an interdisciplinary field.

Technology is important, but it is not possible to leave the entire matter of digitisation to the technologists and computer scientists, because of two major differences : they do not share the same knowledge domain as librarians (information professionals ?) and they do not have the same professional obligations – in other words, our social role.

It is widely considered that new technologies open up new possibilities, both for better and for worse, as cultural, political, economic, social, and institutional processes determine which opportunities are accepted, and the degree to which they are utilized. The World Summit on the Information Society (WSIS), a series of conferences held in the early 2000s, believed that Millennium Development Goals (MDGs) could be achieved through the application of ICTs to development, as well as to changing how education was delivered, and thus would effect concomitant changes in educational policies. Indeed, an explicit objective of the WSIS is to promote the application of ICTs to achieving the MDGs. Yet the vision of the Information Society in the public mind goes well beyond the MDGs (which focus largely on the eradication of



poverty and its effects), moving toward a post-industrial society with higher standards of living for all.

However, we are of the belief that it is not the technology itself that will create such social change and advancement : it is the information, or ideas, whose distribution the technology facilitates, that will make such changes. Naturally, the two are closely linked, but there should be recognition that in some circumstances, communication technologies such as books may be more appropriate or useful than the internet, because of poor infrastructure, low literacy levels, and the like. And those professionals who are most closely involved with the dissemination of information and ideas that can be used to solve problems and inform decisions are librarians. In the digitised world, we can do this through the use of digital libraries of all types.

In conclusion, education for information professionals must be directed towards producing professionals who play a key role in managing and controlling information flows in society, and whose objective it is to deal with society's information (not technological) problems. We suggest that there is room for new directions in research which is both unique to the field and which demands a multidisciplinary approach. For example, there is little or no research which examines the uses that people make of information once it is accessed, or the multiple roles libraries play in their diverse communities, whether analogue or digital, over time. Perhaps if this kind of work is undertaken, the social responsibilities of librarians will become clearer and more meaningful to others, and will provide quite different opportunities for information professionals.

- 1. DILL (digital LIBrary Learning) is an international master's degree selected from the Erasmus Mundus Programmes <http://dill.hioa.no>.
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- 3. J. Thomson, *Library Power: a New Philosophy of Librarianship*, Bingley, Linnet Books, 1974, p. 70.
- 4. H. M. Gladney, "Information Science and Scholarly Writing", *Digital Document Quarterly*, 7, 3, 2008 [http://www.hgladney.com/ddq\\_7\\_3.htm](http://www.hgladney.com/ddq_7_3.htm).
- 5. *Ibid.*
- 6. C. Zins, "Classification schemes of Information Science : twenty-eight scholars map the field", *Journal of the American Society for Information Science and Technology*, 58, 5, march 2007, p. 645-672.
- 7. H. M. Gladney, "Perspectives in trustworthy information", *Digital Document Quarterly*, 6, 3, 2007 [http://www.hgladney.com/ddq\\_6\\_3.htm](http://www.hgladney.com/ddq_6_3.htm).
- 8. *Ibid.*
- 9. Digital Library Federation, "A working definition of digital library", 1998 <http://old.diglib.org/about/dldefinition.htm>.
- 10. B. Hjørland, "Documents, memory institutions and Information Science", *Journal of Documentation*, 56, 1, Jan. 2000, p. 27-41 (29) [http://iva.dk/bh/Core%20Concepts%20in%20LIS/articles%20a-z/Documents\\_memory%20institutions%20and%20IS.pdf](http://iva.dk/bh/Core%20Concepts%20in%20LIS/articles%20a-z/Documents_memory%20institutions%20and%20IS.pdf).
- 11. *Ibid.*
- 12. D. Marcum, "Requirements for the future digital library : an address to the Elsevier Digital Libraries Symposium Philadelphia, PA, 25 January 2003", Council on Library and Information Resources [http://www.clir.org/pubs/resources/dbm\\_elsevier2003.html](http://www.clir.org/pubs/resources/dbm_elsevier2003.html).

- 13. B. M. Leiner, “The scope of the Digital Library”, paper presented at the DLib Working Group on Digital Library Metrics, 16 January 1998, revised 15 October 1998  
<http://www.dlib.org/metrics/public/papers/dig-lib-scope.html>.
- 14. L. Kajberg, L. Lørring, ed., *European Curriculum Reflections on Library and Information Science Education*, Copenhagen, Royal School of Library and Information Science, 2005.
- 15. S. Myburgh, *Designing Information: the Site of Struggle*, PhD Thesis, University of South Australia, 2007 (unpublished).
- 16. Digital Curation Centre <http://www.dcc.ac.uk/>.
- 17. Z. Manžuch, I. Vatanen, T. Aparac-Jelusic, T., “Digitization of Cultural Heritage”, in *European Curriculum Reflections*, *op. cit.*, p. 35-59.
- 18. *Ibid.*
- 19. *Ibid.*
- 20. Process of harmonisation of Higher Education institutions started by European Universities in 1999 in Bologna [http://ec.europa.eu/education/higher-education/doc1290\\_en.htm](http://ec.europa.eu/education/higher-education/doc1290_en.htm).
- 21. Please note that all students’ comments appear exactly as they wrote them, and their grammar is not always correct.
- 22. J. Daly, *Information and Communications Technology Applied to the Millennium Development Goals*, Washington DC, Development Gateway Foundation, 2003  
<http://old.developmentgateway.org/download/222153/JohnDaly-Main.doc>.