

# Theorems of Information Literacy.

## A mathematical-like approach to the discourse of Information Literacy <sup>1</sup>

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### Abstract

The paper recognises that the universe of discourse on Information Literacy (IL) has to be stratified into different layers. The proposed stratification can be of use both for a theoretical systematisation of the issue and for identifying a sequence of measures aimed at an effective propagation of a Culture of Information.

The paper presents a mathematical-like approach, which starts proposing the definitions of some basic concepts and then proceeds with 10 propositions or theses, each supported by a number of argumentations.

The proposed theses are generated by the following perspectives of analysis of the Information Literacy phenomenon, and accordingly grouped:

- a) DISCIPLINARY PERSPECTIVE: analysis of Information Literacy as Culture of Information and as a form of study of information;
- b) SOCIAL/POLITICAL PERSPECTIVE: analysis of Information Literacy as an educational policy goal;
- c) COGNITIVE PERSPECTIVE: analysis of Information Literacy as a form of personal competence.

As a consequence of the proposed theses, the following *foci* of the Information Literacy discourse are identified:

- Information Literacy rationale (theses 1,2,3);
- Policy awareness (theses 4,5,6);
- Planning and implementation (theses 7,8,9);
- Individual development (thesis 10).

Against this background, the paper will explore how the distinction between different stratifications – by trying to give an order to the reasoning about the issues concerning literacy in information – can facilitate the identification of a set of variables to be taken into account in defining a coherent strategy towards making Information Literacy legitimate within the European Higher Education context.

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## 1. Introduction

Nearly twenty years after the historical ALA report<sup>3</sup>, in which Information Literacy (IL) is defined as *“the ability to access, evaluate and use information from a variety of sources”* the configuration of discourse about the IL phenomenon appears focused around the following key issues: the promoter community of the IL problem is the librarian one; in the Library and Information Science (LIS) field a large consent about IL importance do exists, but a universally accepted definition of the concept is still lacking; outside the LIS community a very scarce awareness of the question and of the distinction between the concepts of “Information” and “Informatics” persists and prevails; a great number of tools of self-teaching has been developed, in the form of tutorials, mostly by initiative of libraries; a great amount of specialised literature about IL is available, however it’s needed an agreement about concrete actions, agents and ways for an effective embodiment of the IL objective. The IL territory has been ironically defined as *“the IL land of confusion”*<sup>4</sup>.

In view of the above, we strongly believe that coherent pragmatic decisions can derive from coherent theoretical premises. Therefore, with such intent, we want to propose here several theses, which, supported by adequate argumentations, could be useful in differentiating among discussion levels that, despite their differences, in the literature appears to be undifferentiated.

In fact, our conviction is that the lack of a separation between different “stratifications” of reasoning represents one of the main causes of confusion about IL

<sup>3</sup> ALA Presidential Committee on IL, Final Report on IL, 1989 <http://www.infolit.org/documents/89Report.htm>

<sup>4</sup> <http://lorenzen.blogspot.com/>

discourse and, consequently, that this obscures the way towards concrete and coordinated policy measures.

“Information Literacy” is a complex phenomenon, which can be analysed from several perspectives; here we have chosen to analyse it from the following points of view (see fig.1):

1. disciplinary, as a form of study of information (Culture of Information);
2. social/educational, as a form of literacy (Information Literacy);
3. cognitive, as a form of individual competency (information skills or i-skills).

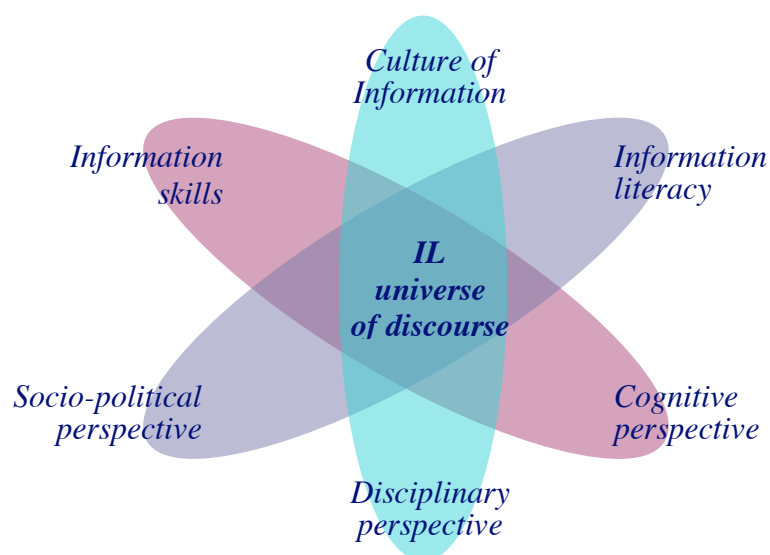


Fig.1: Perspectives of analysis of the Information Literacy discourse

## 2. Definitions

The complexity of the IL concept exceeds the literal meaning of the expression, nevertheless, the practice of going back to the literal meaning of the term "literacy" can be of use. As resulting from the etymological and philological analysis of the English term “**literacy**”<sup>5</sup>, this refers to a **status**, a **condition**, and in English there is not a verb analogous to the Italian “alfabetizzare”, with a similar meaning of “making people to become literate”<sup>6</sup>. For the purposes of this paper it’s fundamental to distinguish two meanings of the term literacy: the **status** (to be literate) and the **process** (to make someone becoming literate).

**DEFINITION.** *Information Literacy (as process):* educational **process**, of *political derivation*, that aims at spreading in a *population* a *minimum level* of competencies for the retrieval, evaluation and exploitation of information from a variety of sources.

**DEFINITION.** *Information Literacy (as status):* social objective of educational policy; **state** or **condition**, result of a process; to have acquired the competence to retrieve, evaluate and use information from a variety of sources.

<sup>5</sup> carried out by Lisa Reggiani – Ceris-CNR Institute

<sup>6</sup> In fact, the English verb “to alphabetize” means “to put in alphabetical order”.

The distinction between the process and its result is essential for the purposes of this paper. In fact, the reasoning on the result articulates around variables like:

- expected competency level;
- aims of learning;
- assessment procedures;

while reasoning about the process articulates around other variables, like:

- planning of actions,
- target communities;
- curriculum design;
- course configuration;
- teaching agents.

The theses described in the following paragraphs are strictly connected with the definitions here provided: some of them represent a justification of the proposed definitions, particularly for terms in *italics*, while others are consequences of them. Other theses provide the rationale of our reasoning and thus are described as first in the next section.

### 3. Information Literacy as a discipline of study

#### THESIS 1: THE CULTURE OF INFORMATION FALLS WITHIN THE DISCIPLINARY FIELD OF DOCUMENTATION-INFORMATION SCIENCE<sup>7</sup>

Firstly, we want to place in a definite disciplinary field the knowledge transferred during the process of IL. This perspective of analysis regards IL as a **form of study of information**, as a branch of knowledge and therefore as a subject of study, which we will call “Culture of Information”. We refer to the seminal work of Fritz Machlup and Una Mansfield<sup>8</sup> for a deepening and a comparison between nine disciplinary fields, whose study object, principle or secondary, is information:

*“cognitive sciences, computer and information science, artificial intelligence, linguistics, library and information sciences, cybernetics, information theory, mathematical system theory and general system theory”.*

In the same work the authors explain the debate about the suitability of the connotation as “science” for some disciplines, an issue outside the scope of this paper. Nevertheless, it is worth to underline the existence of **cultural differences in the study of information**, even in the limits of the LIS (Library and Information Sciences) field.

The common theoretical matrix of the various documentary disciplines - Archival Science, Library Science, Bibliography, Documentation or Information Science - is undeniable. However, those elements, which at a theoretical level represent a partial difference, in the purposes of the single disciplines constitute a relevant distinction.

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<sup>7</sup> Hereafter the terms Documentation and Information Science will refer to the same discipline, since the former – in use until 1969 - is the older name of the latter.

<sup>8</sup> Machlup, F. – Mansfield, U. *The study of information. Interdisciplinary messages*, Wiley & Sons, 1983

By accepting such significant common matrix, the Culture of Information inherits **methodologies and tools** from Bibliography, Library Science, Documentation, Scientific Research Methodologies and Computer Science<sup>9</sup>.

However, from Documentation three fundamental elements are additionally and specifically inherited:

- the **ability of mapping** heterogeneous sources,
- a **critical sense** and **evaluation ability**,
- and – most important – the **typology of results**.

In fact, by limiting the comparison between Documentation and Library Science in other papers we have underlined that:

*“In comparison with the result of the reference service, which points out and refers to information sources, the result of the documentation service is a synthetic processing of various sources; it is the answer and not just a medium to achieve it.”<sup>10</sup>*

As to the comparison between *Library Instruction* and *Information Literacy*, the first one is limited to sources and services provided by the library and it is addressed to library users, while the second one relates to every form of explicit, codified and recorded information, and it is addressed to everyone who needs information for study or practical purposes.

As a disciplinary field, IL can therefore be considered as a branch of the Information Science, as this one affects much more IL aims.

The **relation between Culture of Information and Information Science or Documentation** can be better described through an analogy with the relation between Computer Literacy and Computer Science; reasoning about this analogy on the one hand is useful to put an accent on the distinction between the concepts of Information Literacy and Computer Literacy, on the other hand to better understand the disciplinary placement of IL.

The disciplinary matrix of Computer Literacy is Computer Science, as well as that one of IL is Information Science.

Therefore we could point out a derivation relation between matrices and branches as follows:

$$\text{branch } X : \text{matrix } X = \text{branch } Y : \text{matrix } Y$$

which in the analysed case appears as follows:

Information Literacy : Information Science = Computer Literacy : Computer Science

A first consequence of this relation is that in both couples the **matrix** is a discipline, which forms the **professionals** of that subject (respectively documentalist and the so-called computer specialists), while the **branch** is a discipline, which forms the **user**, respectively of information and of computers. This can be synthetically represented as:

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<sup>9</sup> the list is merely in alphabetical order, without any attribution of relevance as to the influence on IL of the various disciplines.

<sup>10</sup> BASILI, Carla. *L'assetto disciplinare della Documentazione. Alcune riflessioni*, "AIDA Informazioni", 18(2000), n. 3/4, p.30-35

*Information Science : Information Professional = Computer Science : Computer Professional*

*Information Literacy : Information User = Computer Literacy : Computer User*

A second consequence relates to the inheritance of basic characteristics from the matrix: the branch inherits the main characteristics of the matrix from which it derives. Should we place the different concepts in a thesaurus, the relation between terms could be represented as follows:

<i>Information Science</i>	<i>Computer Science</i>
<i>NT Information Literacy</i>	<i>NT Computer Literacy</i>

And viceversa:

<i>Information Literacy</i>	<i>Computer Literacy</i>
<i>BT Information Science</i>	<i>BT Computer Science</i>

Therefore - we want to stress again - Culture of Information is aimed at educating the information user, and it is distinguished from the education of the information professional.

## **THESIS 2: THE CULTURE OF INFORMATION IS A KNOWLEDGE INDEPENDENT FROM EVERY APPLICATION DOMAIN**

The definition of “discipline” provided by Machlup and Mansfield, that we entirely report:

*“Disciplines (sciences, academic areas of research and teaching) are orderly arrangements (metaphorically called bodies) of coherent thoughts, formulated as propositions, about things (sense-objects or thought-objects) deemed worthy of being known (i.e., being believed with some degree of confidence) and being passed on. (Machlup-Mansfield, p.3)”*

is enough clear and simple for the scope of our reasoning.

In addition, most scientific disciplines present a **theoretical** and an **applicative component**. This is affirmed by Borko in relation to Documentation, at the moment of the epochal transition from “Documentation” to “Information Science” in 1968<sup>11</sup>.

*“Information Science [ ... ] is concerned with that body of knowledge relating to the origination, collection, organisation, storage, retrieval, interpretation, transmission, transformation, and utilisation of information. It has both a pure science component, which enquires into the subject without regard to its application, and an applied science component, which develops services and products. (Borko,1968<sup>12</sup>)”*

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<sup>11</sup> This change of denomination is considered as officially ratified in 1969 with the new denomination of the American Documentation Institute, which became American Society for Information Science.

<sup>12</sup> BORKO, Harold (1968) *Information science: What is it?* Journal of the American Society for Information Science, 19, 3-5.

Ancient Greeks already made a distinction between *Επιστήμη* (epistémē) – science or scientific cognition - and *Τέχνη* (téchne) – art, skill or ability, instrumental, context and practical knowledge.

Aristotle's position, in particular, has been understood by modern science as basis of the distinction between **theory** (possession of knowledge) and **practice** (the field of craft, profession)<sup>13</sup>.

Because of its derivation from Documentation (compare Thesis 1), the Culture of Information inherits the same components.

The **theoretical component** is based on a set of general principles, logical constructions and standardised methodologies, inheritance of the Information Science<sup>14</sup>, which represent the theoretical basis for structuring, representing and organising information. Objects of study, just citing some of them, are: architecture of a system for information retrieval, structure of an apparatus for indexing, methodologies of evaluation of sources, criteria for analysis of sources, techniques for production of *dossiers*. Besides these we find general principles and context knowledge such as: concept of bibliographic control, processing of the documentary chain, information life cycle, ethical use of information. Such theoretical foundation is completely **independent from its applicative context**, which permits to place the Culture of Information among the other disciplines of study. The theoretical component, in other words, constitutes the property of transversality of the Culture of Information with respect to subject (or vertical) disciplines like Astrophysics, Geology, Medicine, and so on (see Thesis 3 below).

On the other hand, **only the applicative component** of the Culture of Information can – but not necessarily must – be intended as functional for a specific domain or field of study. It comprises the study of services and information resources of interest for a specific subject field.

The applied component can be integrated into various vertical disciplines (compare Thesis 3 below), through the indication of specific sources and description of particular reference systems, also with support of the library staff.

Another important distinction is between the concepts of education and training. In previous papers we already underlined the need of establishing a Culture of Information<sup>15</sup>, that means to infuse *values* as to the importance of information and its ethical use, while training is mainly concerned with instructions for using tools and information resources.

The specialised literature distinguishes different kinds of knowledge:

- *know-why*: is the knowledge of general principles and laws, which govern nature, human mind and society;
- *Know-what*: is the knowledge of facts (contiguous, as regards its meaning, to that which is commonly defined “information”)
- *Know-how*: refers to the skill and competence in doing something.

With a view to such distinction and considering the large proliferation of courses and IL tutorials, most of which is designed for auto-instruction, we want to stress that IL is mainly “knowledge”, not mere “ability”. This view is supported by Shapiro's and Hughes's concept, who include IL among the liberal arts:

*“Information and computer literacy, in the conventional sense, are functionally valuable technical skills. But information literacy should in fact be conceived more*

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<sup>13</sup> Parry, Richard, “*Episteme and Techne*”, *The Stanford Encyclopedia of Philosophy* (Summer 2003 Edition), Edward N. Zalta (ed.)

<sup>14</sup> This set of general principles constitute the theoretical foundation of Information Science as a scientific discipline

<sup>15</sup> Basili, C. (2000), “*Information literacy*”: *un concetto solo statunitense?* (*Information literacy: a issue only in the USA?*). “AIDAinformazioni”, 19 (2001), n. 2

*broadly as a new liberal art that extends from knowing how to use computers and access information to critical reflection on the nature of information itself, its technical infrastructure, and its social, cultural and even philosophical context and impact - as essential to the mental framework of the educated information-age citizen as the trivium of basic liberal arts (grammar, logic and rhetoric) was to the educated person in medieval society."*<sup>16</sup>

### **THESIS 3: THE CULTURE OF INFORMATION IS A KIND OF TRANSVERSAL KNOWLEDGE**

In the specialised literature the distinction often occurs between subject disciplines and cross-curricular disciplines, where the former – which we call here “vertical” – are focused to a particular field of study and research, while the latter – which we call “horizontal” – have methodological character, independent from a specific scientific sector.

The Culture of Information, as Informatics and Second Language, is transversal to every intellectual activity, and thus it can be introduced in any course of study. In fact, it can be counted among the methodologies of scientific research and it has been defined as the basis for “learning how to learn”.

Furthermore, the competencies acquired (information skills) are defined in the European Education Thesaurus as included in the Basic Education<sup>17</sup>, as follows:

#### **basic education**

MT (10) content of education

da: grunduddannelsede: Grundbildung

el :

es: educación básicafi : perusopetus

fr : éducation de baseit : educazione di base

nl : fundamenteel onderwijspt : Educacão de base

sv: grundutbildning

SN instruction in subjects of elementary education, social skills and community responsibilities

UF fundamental education

NT1 computer literacy

NT1 **information skills**

RT basic training

RT content of education

RT minimum competencies

#### **information skills**

(1997)

MT (10) content of education

MT (21) personality

da: informationsfærdighederde: Orientierungswissen

<sup>16</sup> SHAPIRO, Jeremy J. and HUGHES, Shelley K. (1996) *Information Literacy as a Liberal Art: Enlightenment proposals for a new curriculum*. «Educom review». 31 (2), 31-35. <http://www.educause.edu/pub/er/review/reviewArticles/31231.html>

<sup>17</sup> [http://www.eurydice.org/TeeForm/TEE\\_DOWN\\_EN.htm](http://www.eurydice.org/TeeForm/TEE_DOWN_EN.htm)



el :

es: habilidades de informaciónfi : tiedonhankintataidot

fr : compétence en recherche d'informationit : abilità d'uso dell'informazione

nl : informatievaardighedenpt : Competência na pesquisa de informação

sv: informationsfärdighet

### **BT1 basic education**

BT1 skill

BT2 aptitude

RT information

RT media education

### **THESIS 4: THE CULTURE OF INFORMATION IS DISTINCT FROM THE INFORMATICS CULTURE**

In 1983 F.W. Horton pointed out the distinction between Information Literacy and Computer Literacy – affirming that:

*“Computer literacy has to do with increasing our understanding of what the machine can and cannot do. There are two major components of computer literacy: hardware and software.*

*... Information literacy, then, as opposed to computer literacy, means rising the level of awareness of individuals and enterprises to the knowledge explosion, and how machine-aided handling systems can help identify, access and obtain data, documents and literature needed for problem-solving and decision-making. [Horton, 1983]<sup>18</sup>”*

As a matter of facts, today all the secondary information and an increasing part of the primary is available in electronic format. Correspondently, a great variety of search software exists and therefore its functionality as computer application has to be understood and studied. Nevertheless, the large part of the study should concern the general logic of the internal design of this class of packages, and its strong relation with the underlying information architecture.

### **4. Information Literacy as social objective**

### **THESIS 5: INFORMATION LITERACY IS A REQUISITE OF THE INFORMATION SOCIETY**

The reasons supporting this thesis can be found in the introduction of nearby all articles dealing with the issue of Information Literacy, therefore we will just cite the most recurring slogans related to well-known problems and needs of the current Information Society:

- information overload;
- information smog;
- learn how to learn;

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<sup>18</sup> Horton, Forrest Woody Jr. (1983), *Information literacy vs. computer literacy*. “Bulletin of the American Society for Information Science”, Vol. 9, No. 4, April 1983

- active citizenship;
- information divide.

The only remark we want to underline is a kind of graduality in the different purposes of Information Literacy. In the literature it seems to exist a large consent about the close relation between Information Literacy and processes like *problem-solving* and *decision-making*. However, these purposes can be conceived as one end of a spectrum, where the opposite end is the enlargement of individual knowledge. With Figure 2 we try to provide a graphic representation of this concept.

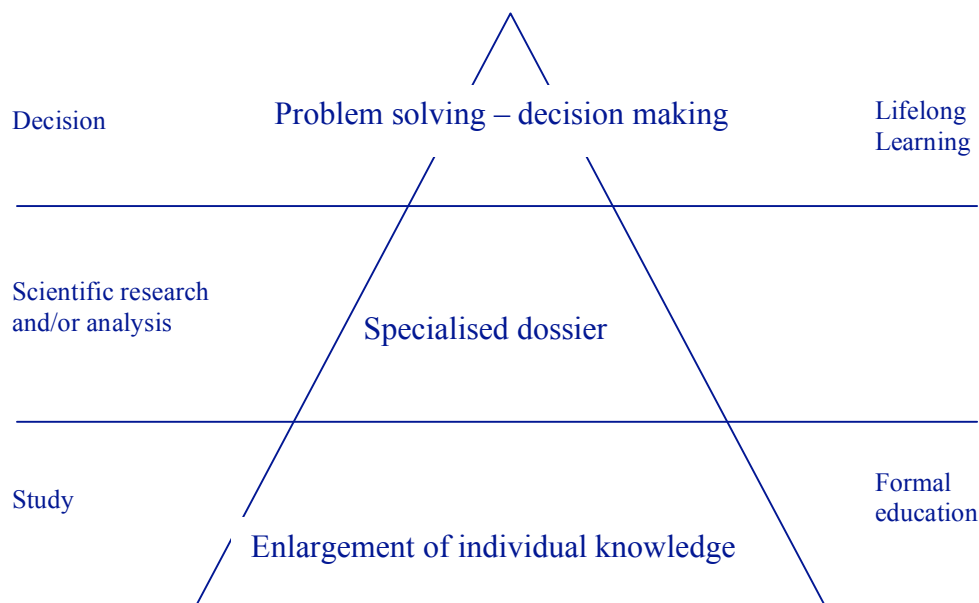


Fig.2: Aims and contexts of Information Literacy exploitation

## THESIS 6: INFORMATION LITERACY IS AN OBJECTIVE OF EDUCATIONAL POLICY

In section 2. we defined information literacy as an educational policy goal. In the following ones we will give a number of argumentations supporting this thesis. Firstly, the original meaning of term “literacy” – i. e. “to be able to read and write” – historically originates as political objective aiming at solving the question of illiteracy.

Furthermore, Zurkowsky<sup>19</sup> himself, to whom the coin of the expression “*information literate*” has been attributed, characterizes it as an intervention of

<sup>19</sup>Zurkowski, Paul (1974), The information service environment: Relationships and priorities. Washington, DC : National Commission on Libraries and Information Science. Government Printing Office, 1974 (Report ED 100391).

political matrix. This cannot be recognized in the sentence intensively cited in the literature as follows:

*“People trained in the application of information resources to their work can be called information literates. They have learned techniques and skills for using the wide range of information tools as well as primary sources in molding information solutions to their problems [Zurkowski, 1974]“.*

but rather in the abstract of his paper found in the Eric database<sup>20</sup>:

*“The relations of the National Program for Library and Information Services to information literacy and the information industry are discussed. Private sector information resources are identified in several categories. The traditional relations of libraries and with the information industry are described, and examples are given of situations where traditional roles of libraries and private sector information activities are in transition. It is suggested that the top priority of the National Commission on Libraries and Information Science should be directed toward establishing a major **national program** to achieve **universal information literacy** by 1984. (PF)”*

In fact, in the abstract – as we can see – is clearly mentioned Zurkowsky’s hope that a national program would be started, aiming at achieving universal information literacy within a decade.

#### **THESIS 7: INFORMATION LITERACY IMPLIES A MASSIVE OPERATION**

The definition of information literacy proposed in section 2. implies the concept of “target population” of the Information Literacy process.

As we understood this expression and according to the character of Zurkowsky’s paper, target population is every citizen who is in condition of information illiteracy. However, it is necessary to consider those cases where the educational objective is pursued for a limited universe in comparison with that of a whole nation: a region, a province, a municipality, a university, a school. The case of studying population of **universities** is of particular interest to our analysis.

The IL process, anyway, implies the idea of a mass-operation, according to its policy connotation (see theses 6). This aspect can be easily recognised even in the denomination of international initiatives like the Unesco “Information *for all* Programme”.

#### **THESIS 8: INFORMATION LITERACY REFERS TO A MINIMUM AMOUNT OF COMPETENCIES**

The concept of literacy has been extended from its original meaning, i. e. “ability to read and write”, to that of **competencies of general character**, dispensed to individuals which are completely or nearly completely incompetent in that matter<sup>21</sup>.

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<sup>20</sup> ED100391: The Information Service Environment: Relationships and Priorities. Related Paper No. 5.

<sup>21</sup> We intend, for example, the processes of diffuse Second language and Computer Literacies launched in the primary school in the last decades.

This is opposite, we underline this concept, to the professional training of information specialists (see Thesis 1).

We can consider three levels of competence:

- Basic
- Advanced
- Specialised

In fact, besides the literal meaning of the term “literacy” - which calls for an educational strategy informed to a “minimum common denominator” - it could be useful to consider also both advanced and specialised levels of competence, particularly in the Higher Education context.

Our vision of the three levels of IL competency is outlined below.

#### **Basic IL competencies:**

- Fundamental concepts: value of information, a general picture of the information universe
- Basic theoretical level: information mapping, Information Retrieval basics, *minimum* set of evaluation criteria

#### **Advanced IL competencies:**

- Basic IL competencies
- Analysis of information sources
- The logic of the Information Retrieval process
- Semantic representation of documents (basic concepts)
- Scientific writing

#### **Specialised IL competencies:**

- Advanced IL competencies
- Disciplinary information mapping
- Specific search tools
- Disciplinary writing

The set of theoretical concepts – in each competency level - is fundamental for learners in order to make them able to deal also with **future** information retrieval tools.

The distinction among different levels of IL competency is relevant for the discussion about two main points: the configuration of IL relative to the curriculum and the attribution of the charge of teaching (see section 6).

### **THESIS 9: INFORMATION LITERACY REQUIRES CHANGES IN THE EDUCATION SYSTEM**

To date, the teaching dimension of IL has been developed mostly by autonomous initiative of libraries worldwide, in the common format of tutorials and self-instruction courses (see PRIMO)<sup>22</sup>.

Nevertheless, IL – as a requisite of the Information Society (see thesis 5) – cannot be developed in episodic and fragmented forms, but rather through coherent policy measures concerning modifications in the education system.

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<sup>22</sup> <http://www.ala.org/ala/acrlbucket/is/iscommittees/webpages/emergingtech/site/index.cfm>

This topic represents a key issue for an effective implementation of the IL process, as it comprises a conversion of policy goals into operational terms.

Implementing such transformation means to identify (and agree upon) one of the alternative paths of modification of the education system.

The general concept of Education Policy as it is defined into the TESE - Thesaurus for Education Systems in Europe – 2006 Edition<sup>23</sup>

**Education policy**

MT (04)

SN:

UF educational policy

NT **access to education**

NT **accreditation**

NT **democratisation of education**

NT **duration of compulsory education**

NT **duration of studies**

NT duration of the academic year

NT duration of the school year

NT forecasting

NT free education

NT language policy

NT **planning**

NT **priority area**

NT promotion of mobility

NT **reform**

NT school closure

NT setting up a school

RT education

RT educational authority

can help in outline the issue. We underlined those terms which are (to different extents) of interest for an IL policy.

Our vision of the problem – which is strictly connected to the scope of the European network on Information Literacy<sup>24</sup> we launched in 2001 - is more oriented towards a policy inspired by the Bologna process for Higher Education in Europe.

The Bologna process, aimed at establishing a European Higher Education Area, operates along a number of action lines. In the reasoning about the institutionalisation of IL within the Higher Education context, of particular interest are the “Bologna” activities of curriculum design and harmonisation, together with the introduction of the concept of learning outcomes.

The first series of activities are now being carried out through the “Tuning Educational Structures in Europe” project<sup>25</sup>, which is aimed at;

<sup>23</sup> <http://www.eurydice.org/portal/page/portal/Eurydice/TESEHome> It is meaningful to note that on April 2008 the descriptor “Information Literacy” is absent from the Tese thesaurus, while it is present in the Eric Thesaurus since 1992.

<sup>24</sup> <http://www.ceris.cnr.it/Basili/EnIL/index.html>

- "Tune" educational structures in Europe, and thereby aid the development of the European Higher Education Area.
- Open up a debate on the nature and importance of subject-specific and general competences, involving all stakeholders, including academics, graduates and employers;
- Identify and exchange information on common subject-based reference points, curricula content, learning outcomes and methods of teaching, learning and assessment;
- Improve European co-operation and collaboration in the development of the quality, effectiveness and transparency of European higher education by examining ECTS credits and other suitable devices to enhance progress.

Among the Tuning project activities, it is useful to recall the analysis – for each course of study and disciplinary sector – of the differences existing among the curricula of the universities in Europe, in order to make more comparable (and therefore transferable) curricula of the same subject area.

The concept of learning outcomes is strictly related to the quality assessment procedures of universities, which are asked to demonstrate the efficient achievement of these, particularly in response to calls for accountability<sup>26</sup>. It is a concept quite new in Europe, while elsewhere, for example in Australia and the USA, is among the well-established criteria for universities to obtain government funds. In fact, in Australia and the USA, the learning outcomes are explicitly declared into the mission of the single university and constitute the set of competencies that graduates are expected to acquire. They must be measurable in order to give evidence of the successful completion of a cycle of study. It is worth to note that in most Australian universities, IL is included among the learning outcomes (or graduate attributes as they are also known in the USA)<sup>27</sup>.

## 5. Information Literacy as cognitive acquisition of individuals

### THESIS 10: INFORMATION COMPETENCIES (OR I-SKILLS) MUST BE CERTIFICATED

Acquired information competencies constitute the learner dimension of Information Literacy. The cognitive perspective is the most analysed in the literature and a number of standards has been developed for different classes of learners. Of particular interest for the scope of this paper are the ACRL Competency Standards for Higher Education<sup>28</sup>.

It is meaningful to distinguish between two main classes of learners:

- those still within the cycles of formal education (pupils in primary education, students in secondary and higher or tertiary education);
- those already outside the formal education system, i.e. in the lifelong learning context.

Information competencies achieved within the formal Education fall within the standard evaluation procedures, like any other competence dispensed there. In

<sup>25</sup> <http://tuning.unideusto.org/tuningeu/>

<sup>26</sup> Barrie, S.C. *Rethinking Generic Graduate Attributes*, HERDSA News, Draft, 5 March 2005

<sup>27</sup> [www.caul.edu.au/surveys/info-literacy2004.doc](http://www.caul.edu.au/surveys/info-literacy2004.doc)

<sup>28</sup> <http://www.ala.org/ala/acrl/acrlstandards/informationliteracycompetency.cfm>

previous sections the connotation of the Culture of Information as an autonomous discipline has been already discussed (compare theses 1-3).

Out of the formal education cycles, and therefore in the lifelong learning context, it is necessary to define and develop methodologies for standard certification. In this direction could be the setting-up of an Information Driving License – perhaps at European level (EiDL<sup>29</sup>), analogous to the European Computer Driving License (EcDL). The EiDL could be calibrated on a minimum level of competency (the basic level – see thesis 8) in order to be suitable for both a massive operation (see theses 7) and generalised needs, independent from a specific application field (see thesis 2).

## 6. The resulting picture: consequences of the proposed theses

The theses illustrated in the previous sections can be, in turn, assumed as statements to be taken into account in outlining how IL could be institutionalised in European universities.

A first step should be that of promoting among academics and policy makers the awareness of both the need of IL (see thesis 5) and the distinction between IL and Computer Literacy (thesis 4). Alongside, the idea of replicating – *mutatis mutandis* – an institutional configuration path similar to that of Computer Literacy can be suggested. Both disciplines, in fact, are transversal and useful to every course of study (see thesis 3).

A second step could be to insert IL among the learning outcomes of European universities and, particularly, among the so-called “generic instrumental competencies” (theses 11 and 3). A viable solution could be to integrate the ACRL Competency Standards for Higher Education into the Tuning project<sup>30</sup> activities<sup>31</sup>.

A strong assumption underlying the previous steps is to recognise the Culture of Information as a discipline in its own right (thesis 1), to be conceived mainly as "knowledge" then as mere "ability" (thesis 2), independent from any subject discipline (thesis 2), except for its applicative component (thesis 1), which can be related to the specialised IL competency level (thesis 10).

The second edition of the Anzil framework<sup>32</sup>, includes the following table, adapted from the work of Bruce<sup>33</sup>:

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<sup>29</sup> BASILI, Carla (ed.) *Information literacy in Europe. A first insight into the state of the art of information literacy in the European Union*. Consiglio Nazionale delle Ricerche, Roma, 2003, 315 pp., p. 9

<sup>30</sup> <http://tuning.unideusto.org/tuningeu/>

<sup>31</sup> It is important to underline that the Tuning project is a university-led project. It presents the motivated and generous work of 128 academics from 105 University departments across the length and breadth of Europe (<http://tuning.unideusto.org/tuningeu/>: final report of Tuning phase 1)

<sup>32</sup> BUNDY, A. (ed.) *Australian and New Zealand Information Literacy Framework. Principles, standards and practice* Second edition, Australian and New Zealand Institute for Information Literacy, Adelaide, 2004

<sup>33</sup> BRUCE, C. *Information literacy as a catalyst for educational change: a background paper*. White paper prepared for UNESCO, the US National Commission on Libraries and Information Science, and the National Forum on Information Literacy for use at the Meeting of Information Literacy Experts, Prague The Czech Republic 2002 <http://www.nclis.gov/libinter/infolitconf&meet/papers/bruce-fullpaper.pdf>

Generic	Extra curricular classes and/or self paced packages
Parallel	Extra curricular classes and/or self paced packages that complement the curriculum
Integrated	Classes and packages that are part of the curriculum
Embedded	Curriculum design where students have ongoing interaction and reflection with information

*Table.1 Information literacy program components*

We would like to use this classification for reasoning about a range of **disciplinary configurations** of the discipline “Culture of Information” with respect to the academic curriculum. This implies a reformulation of the Anzil table above as follows:

Generic	Extra curricular, not credit-bearing
Parallel	Extra curricular discipline, credit-bearing, optional
Integrated	A discipline inserted into the curriculum, credit-bearing, mandatory
Embedded	Part of subject disciplines

*Table.2 disciplinary configurations of IL in a course of study*

According to table 2, the responsibility of teaching could be attributed to librarians for the basic level competencies (what in the table is “generic”) and to academic staff from the LIS Faculties for the other configurations. The embedded configuration - corresponding, in our vision, to what we defined as “specialised competency level” - should be imparted by academics of the “host” subject discipline.

## **Concluding Remarks**

Adoption of a comprehensive policy on Information Literacy is crucial for its institutionalisation within the Higher Education context.

Far from pretending to be exhaustive, the paper attempts to stimulate a debate around specific points of the Information Literacy discourse, by splitting it into a number of components and by grouping those components according to three perspectives of analysis of Information Literacy: as a discipline of study, as an education policy goal, as a competence.

According to the European network on Information Literacy research perspective, the discussion has been mainly focused to the Higher Education context, even if some of the concepts expressed are of general interest.

Some of the consequences derived from the proposed framework of analysis are in contrast to the positions dominating the specialised literature. It is hoped that just this contrast could be of some help in the debate around Information Literacy in Europe.



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