Computer, information and academic literacies in LSP pedagogy:
Implications for curriculum design

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1 Introduction

One of the reasons for the impact that Computer Assisted Language Learning (CALL) approaches had on Language for Specific Purposes teaching practices, as compared to General English ones, comes from the fact that many of these courses are immersed in technical and scientific careers. The influence of technology was reflected in syllabus design, which relatively quickly included tasks involving the use of Internet and computer applications. Moreover, the students' achievement of computer or digital literacy alongside the core subjects' demands became one of the main concerns in the last decades.

But CALL theories have given way to more sophisticated, integrative ones, such as computer-supported collaborative learning (CSCL). One of the basic tenets of this approach is that technology serves for group development providing the means for interactive, purposeful learning. This seems to fit well with content approaches where complex tasks involving several skills are basically fulfilled through group work. However, this type of learning is not only common in language learning environments. Constructivist and collectivist theories, to name just two of them, as applied in different fields, call for a similar type of approach in the teaching of different subjects at different levels, and in an increasing number of electronic environments. In all of them language use is envisaged, to a higher or lesser extent, as a critical tool, if not the medium through which different literacies can be achieved.

Technology is a necessarily key component, but its degree of presence varies, depending either on the teaching paradigm preferred for a given subject field, or even on teaching staff personal preferences. Furthermore, many scholars feel that, even though the students' attainment of computer literacy is a necessary goal, it should not be contemplated on its own for curriculum design purposes. The aim of this contribution is to show the different parallelisms and overlaps in approaches to literacy coming from different fields such as Information Science or Applied Linguistics (and, within the latter, Languages for Specific Purposes). Three main different types of literacy are discussed, namely computer or electronic, information and academic ones. The two former are advocated mainly in Information Science, the latter in Applied Linguistics and, more generally, in Education fields. But there are striking similarities

between them, so we could state that they complement each other and should be taken into account as a whole for an optimal teaching practice in any field of tertiary education.

The integration of these three literacies in a genre and content-based curriculum is specifically envisaged as a key ingredient for the teaching of any ESAP (English for Specific Academic Purposes) subject at tertiary education. Part of the nature of these subjects is to allow learners to become members of their specific discourse communities through the use of English. This is more so in the case of subjects like *English for Library and Information Science* (ELIS), whose interdisciplinary character makes it difficult to avoid their inclusion, and where specific field practices urge for an increasingly higher presence of digital tools. The presence of Communication and Information Technologies (CITs) as the prevailing medium of interaction makes the CSCL environment an essential element for the attainment of multiple literacy goals.

2 Computer literacy and Language for Specific Purposes teaching

2.1 Computer-supported content-based approaches to EFL-ESL learning

At a first stage and in Computer Assisted Language Learning (CALL) approaches, Information Technology (IT) was considered both the medium and the goal. There was an initial over-enthusiasm about its usefulness for language learning that led to the point of considering IT as the end in itself. At a second, current stage, the Internet has become the main device with respect to other applications (such as tailor-made programmes) and IT is rather envisaged as a "tool" for collaborative learning in what has been termed "Computer-supported collaborative learning" (CSCL). More than the end, IT is a powerful resource, as Warschauer (2002) argues: "Technology does not constitute a method; rather, it is a resource that can be used to support a variety of approaches and methods" (Warschauer 2002: 55).

Vygotsky's Social Constructivist Theory has reappeared with a view of the individual's cognitive development enhanced by the social context and in co-operative learning situations (Chapelle 2001). In this sense, the role of the Internet in academic discourse has become crucial for group work and individual development (Warschauer 2002).

The latest European teaching policies have aimed at an integration of language and content in CLIL approaches (i.e. content and language integrated learning). Language is seen as a vehicle for the learning of different subjects, while subject content is, likewise, the vehicle to learn the language. As Trenchs Parera (2001: 34) states:

El aprendizaje de una lengua irá intrínsecamente ligado al uso de la tecnología y al aprendizaje de contenidos, precisamente porque el lenguaje – tanto si se trata de una primera lengua como de una lengua extranjera – no puede considerarse como un ente autónomo sino como una herramienta que nos permite aprender conocimientos diversos y realizar todas las actividades de nuestra vida diaria.

A great part of the literature written within Languages for Specific Purposes (LSP) in the last decades had also envisaged language mainly as a "vehicle for information", especially with respect to reading skills (Johns and Davies 1983). In parallel to this, a view of learning as acquisition through usage (purposeful tasks) has also prevailed (Widdowson 1983), which fits well with content-based language learning approaches. ESP methodologies have consequently adopted content and task approaches in an attempt to adapt syllabi to the learning context. In these content approaches, real or *linguistic* content and carrier or *conceptual* content (Dudley-Evans and St. John 1998) come very close.

Some examples of refinement of content approaches through IT introduction are those offered by Egbert (2000) and Kasper (2000a, b). Egbert (2000) shows through the *Kids-and-computers Project* how technologies can be both the content and the context at earlier learning stages.

Kasper (2000a) analyses the educational benefits of introducing the Internet in content-based college ESL instruction. Some of them are:

1) It helps increase English Language Literacy (in meaningful learning contexts).
2) It encourages the development of critical literacy and academic research skills (increasing the ability to locate and evaluate information).
3) It promotes student-centred learning (providing information that meets students' own needs).
4) It fosters enhanced meta-cognition (by reflecting on the processes followed to carry out the different tasks).

The actual content-based course description in Kasper (2000a) includes tasks such as visiting websites, making Internet searches and focus discipline research. This last practice is further explained in Kasper (2000b), and seems a good way for tertiary students to acquire scientific literacy while focusing on the content of their disciplines, with the help of IT.

2.2 Computer literacy and English for Specific Academic Purposes at tertiary level in Spain

The term "literacy" has been combined with many others in the recent decades and in different academic fields and subfields, to refer to learning goals, skills and competencies which are requisite within targeted groups (conformed by "users" or "students", or even "discourse community members" or "disciplinary groups" depending on the context). Thus, a "computer literate" person is someone "competent in the use of computers" (Chambers English Dictionary). Haigh (1983: 162) defines "computer literacy" as "that compendium of knowledge and skills which ordinary educated people need to have about computers in order to function effectively at work and in their private lives". From the ESAP viewpoint, and regarding tertiary students' desired competences, Posteguillo (2002) argues that [they] "will have to be skilled at using the Internet and the cyber-genres in an effective way".

Many works on ESP teaching in Spain reflect practices involving IT usage. To name just a few of them, the usefulness of computer labs for the teaching of ESP is shown in Bocanegra (2002) and Luzón Marco (2001), who describes how Online Writing Labs (OWLS) can help technical writing in the foreign language.

Prior to these studies, other works had examined electronic genres or *cyber-genres* and their potentialities for the ESP classroom (Fernández-Toledo 2002). In Bolaños Medina (1996), for example, the Internet is seen as the means for EST students to establish connections and exchange results.

In parallel to the development from CALL to CSLC approaches, more recent works focus on virtual learning environments for EAP-ESP learning, as reflected in the projects developed at the Universitat Politécnica de Catalonia by Rueda Ramos and colleagues (Rueda Ramos, Arnó Maciá and Barahona Fuentes 2002; Soler, Rueda and Arnó 2006).

Many of these works show a progression, from a concern on the inclusion of IT as an element or tool, to more sophisticated curriculum designs which integrate the digital component, not only as the means, but also as the end and the context (Carvalho et al. 2006), in order to foster computer literacy among students.

3 Moving beyond: the concept of information literacy

3.1 Information literacy in the information management paradigm

In the LIS realm, a skill-based orientation with regard to Education prevailed during decades. Content analysis techniques, together with many other tasks and skills traditionally related to the librarian/information specialist, such as cataloguing, classifying, indexing or abstracting, used to constitute the map of technical and procedural knowledge to be acquired at postsecondary levels in order to become a member of the LIS profession, as stated in the ACRL (Association of College and Research Libraries) Information Competency Standards for Higher Education (http://www.ala.org/acrl/ilcomstan.html).

Nowadays, information management or information literacy (IL for short) and computer or electronic literacy conform some of the keywords in the LIS scientific paradigm network, which are also basic tenets for the information professional's code of practice. The dynamics of the information management process, such as the selection, processing, retrieval and use of information, has even spread to other disciplines as the way to acquire knowledge within a cognitive trend. In relation to this, the American Library Association Report on Information Literacy stated in 1998 what it means to be "information literate":

> To be information literate an individual must recognise when information is needed and have an ability to locate, evaluate and effectively use the information needed. Ultimately, information literate people are those who have learned how to learn. They know how to learn because they know how information is organised, how to find information and how to use information in such a way that others can learn from them.

Bawden (2001: 230) further develops this idea and enumerates the skills involved in the process:

- Recognising a need for information.
- Identifying what information would address a particular problem.
- Finding the needed information.
- Evaluating the information found.
- Organising the information.
- Using the information effectively in addressing the specific problem.

"Computer literacy", "IT literacy", "digital literacy", "electronic literacy", or "electronic information literacy" are some other terms which have been coined to name concepts that come very close and that are related somehow to IL. All of them have to do either with being skilled at using technologies either alone or as a tool to acquire knowledge. Nowadays it has become obvious that to be information literate the individual must also be computer literate. Bawden (2001) finds the differences between the above terms of relative importance, and stresses on the need of effective library user education for everybody to become literate:

> Information literacy and digital literacy are central topics for the information sciences. They relate to issues as varied as information overload, lifelong learning, knowledge management, and the growth of the information society. [...]
> To deal with the intricacies of the current information environment, a complex and broad form of literacy is required. It must subsume all the skill-based literacies, but cannot be restricted to them, nor can it be restricted to any particular

technology or set of technologies. Understanding, meaning and context must be central to it. It is not important whether this is called information literacy, digital literacy, or simply literacy for an information age. What is important is that it be actively promoted, as a central core of principles and practice of the information sciences. (Bawden 2001: 251)

Departing from ALA's premises on IL building, Allan (2002) shows some ways to enhance e-learning in the current practice of library and information services. She suggests the adoption of the five-stage model for e-learning as proposed by Salmon (2000), as shown in table 1. The model allows for the group construction of knowledge in a computer-supported environment, which implies the learners' socialization in a collaborative, dialogic way.

Table 1: Five-stage model for e-learning in Allan (2002:12),
adapted from Salmon (2000)

Stage 5	Development
Stage 4	Knowledge construction
Stage 3	Information exchange
Stage 2	Online socialization
Stage 1	Access and motivation

4 Information literacy and academic literacy in Tertiary Education

At the same time that IL has become a crucial issue in the LIS literature and has been defined and contrasted against related concepts such as Computer, Library, Digital, or Network Literacy (Bawden 2001), some parallel movements from other fields such as Education or Applied Linguistics (AL) have also coined the term "literacy". All of them call for a presence in the classroom of certain learning goals which aim at going beyond the traditional meaning of the term as "being able to read and write". The students' attainment of these literacy goals would help them to cope with either general-purpose or technical language, in order to achieve successful communication whatever the scenario – general purposes, work-bound, or academic one.

The movement, fed by Genre Theory (Freedman and Medway 1994, Martin and Veel 1998), first flourished in environments where learners used their mother tongue, and the focus was in overcoming social differences from primary school, mainly through the acquisition of linguistic tools by engaging in the use of the different academic discourses. This was the tenet of the New Rhetoric Approach in North America (Johns 2001), influenced by Carolyn Miller's seminal work on the social potential of genre (Miller 1984), or the Sydney School in Australia led by Michael Halliday, within a systemic linguistic perspective (Martin and Veel 1998; Johns 2001). In teaching contexts where the target language was a second or a foreign one, the acquisition of multiple literacies by learners has been one of the main concerns of scholars. Many of these scholars come from AL backgrounds, and many of them belong, more specifically, to the English for Specific Purposes (ESP) or to English for Academic Purposes (EAP) arenas (or to both).

Examples of leading and illuminating works similarly linked to Genre Theory, from the ESP-EAP perspectives, are those by John Swales (1991; 1998; 2001; 2004) and Vijay Bhatia (1993; 2001; 2002; 2004). In genre-based ESP-EAP approaches, language must be examined and used in relation to its context, at a discourse level, keeping a balance between traditional and new sources and genres, by relating them and fostering "multiple literacies" in students (Bhatia 2001), with an emphasis on specific communication situation and practices (Swales 1998). Some of the keywords in their studies, connected to the concept of literacy, are "genre" or "rhetoric

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awareness", "discourse community", "discursive competence" or "communities of practice", to name just a few. Again, we can see that these terms are already familiar to the LIS field, and can be associated to "collectivist" and "constructionist" metatheories (Talja et al. 2005).

Tertiary education students, whatever their level of specialisation, can be considered, at least potentially, part of the academic discourse community. In this respect, their academic needs include the mastery of academic genres (including cyber-genres). We could say that Academic Literacy is to Academic Knowledge what Information Literacy is to General Knowledge.

After getting feedback from post-secondary students at different levels, Johns and Swales (2002) suggest the following guidelines on what to teach, "from the very beginning of post-secondary education and perhaps earlier" (Johns and Swales 2002: 25) for students to be "academically" literate:

> Faculty in all classes needs to encourage student awareness of the texts, language, research questions, and methodologies of the discipline that the class represents. If possible, the pedagogical genres of these classes should be more disciplinary than school-based.
> Students should be assigned to research texts, practices, language, and other aspects of academic disciplines. They should learn to observe, analyse, ask questions, and if possible, negotiate their tasks to enhance their success.
> Within literacy classes, students should be assigned a variety of writing tasks, requiring a number of inter-textual and formal textual experiences. Students should be encouraged to write in different genres and under different conditions.
> We should encourage student meta-awareness of the social nature of genres. Periodically, students should be asked to reflect upon their literacy experiences and to compare these experiences with those in other classes or other schools.

We might establish many connections, as was pointed out at the beginning of this paper, between Information Science IL and the Academic Literacy proposals coming from Applied Linguistics/ESP-EAP fields. We can even trace some parallelisms between Swales and Johns' above statements on AL and the "Sociotechnical Practice" approach to IL advocated by Tuominen et al. (2005: 341):

> The Sociotechnical practice approach entails an understanding that people are information literate in a given domain if they can recognize and evaluate (read) and produce (write) knowledge claims in that domain and if they have the ability to assess the knowledge produced in the domain.

In both cases, the literacy concept refers to the social purpose of rendering information useful in terms of helping citizens to take informed decisions and to exchange knowledge, either general or specialised, in the quickest, most convenient way in everyday social interactions (see the Genre Theory Blog at http://blog.lib.umn.edu/wardx278/genre/). Furthermore, social context and group interaction are regarded as key aspects which determine and shape literacy practices, beyond the capability of individuals on their own (Talja et al. 2005: 337).

Secondly, as both IL and AL perspectives share a common aim, i.e. to foster academic/workplace literacies. They seem to have followed a parallel development in the consideration of language. This was depicted from a pragmatic angle at first moment (which seems to be the case in John Swales and Vijay Bhatia's former works), evolving to a more dialogic and dynamic conception which, nevertheless, keeps on focusing on specialised discourse and genre.

Thus, Tuominen et al. (2005: 337) advocate for a Bhaktinian-based viewpoint which "sees that knowledge and meanings are built through dialogue and debate", with an emphasis on "the *discontinuities* and *multiple perspectives* in scientific and other kinds

of knowledge *domains*" (emphasis mine). We could relate "discontinuities" to "variability", as posed by the defendants of genres as dynamic entities (Berkenkotter and Huckin 1993).

Authors from both arenas even call for the explicit teaching of discourse conventions in relation to ideology and power. In relation to this, Bhatia (2001) defines "social competence" as the ability to use language sociocritically", which implies not only individuals' being able to use genres, but also contributing to their change as part of the discourse community. On the other hand, scholars from the LIS angle, echoing some of the New Rhetoric basic tenets, defend the inclusion of genre theory in the academic library as a way to foster "critical information literacy" among students, so "librarians can discuss with students how disciplinary discursive practices are not static and monolithic but are constantly being reproduced by the participants of the disciplinary community" (Simmons 2005: 300).

Lastly, technical resources are considered an active, essential component in all these literacy-focused approaches, as Tuominen et al. point out (2005: 339):

> it makes no sense to speak about literacies without considering the technologies that embody them [..]. Social practices structure technologies by giving form and meaning to them. Technologies, in turn, afford new ways of performing social practices and often restructure practices through these affordances.

5 Designing an integrationist, genre and content-based English for Specific Academic Purposes curriculum for *English for Library and Information Science* students

Among all the ESP branches or modalities identified in the literature (Dudley-Evans and St. John 1998), the language needs of ELIS students, as university ones, would fall into English for Specific Academic Purposes (ESAP) category. This learning-teaching modality takes into account both academic and workplace or occupational purposes in the preliminary identification of learners' needs.

The first step for a curriculum design of this kind will be to examine the specific linguistic needs of students who are to be part of their discourse communities, from a "relatively wide" angle (Huckin 2002). This could be accomplished through the textography of the different work and disciplinary domains, as suggested by Swales (2004) and Bhatia (2004). Huckin (2002) also suggests instructing students in analytic strategies, "both rhetorical and textual".

An adaptation of the integrationist paradigm as described in Holliday (1994) seems very suitable for ESAP contexts. Some of the basic features in Holliday's model of approach are:

- Inter-disciplinary character.
- Blurred subject boundaries.
- Skills based, discovery oriented, collaborative pedagogy.
- Flexible timetabling.
- Team-oriented classroom practice.

At the same time, an integrationist approach based on genre, content and task permits to integrate the discursive dimension. Examples of this kind of approach in the ESAP context are shown in the works of Parkinson (2000) and Mavor and Trayner (2001). Through the course designs they describe, they seek to foster the development of professional identity among the students, introducing them into their communities of practice in a strongly interdisciplinary fashion.

5.1 *English for Library and Information Science* genres

With respect to LIS practices and genres, the content ingredient will allow learners to use language as a vehicle, focusing on LIS issues—e.g. information centres, the information process, automation, user needs, information management... In relation to the IS paradigm, most discourse practices can be identified in order to determine the main discursive aspects to select. It is evident that the use of digital information and resources within a likewise digital environment will be commonplace in this kind of paradigm. Information Science genre "colonies" or "networks" would not only include what Posteguillo (2002) names basic EIP (English for Internet Purposes), but also, other genres commonly used in Information Management: databases, thesauri, abstracts and indexes—in both digital and printed support.

In fact, we can trace a development from printed to digital support genres throughout the career, and from academic genres (of mainly descriptive and informative nature) to scientific genres (of informative, expository or evaluative kinds), as shown in table 2.

Table 2: Some components of the LIS genre network: development over the three academic years

Printed support academic genre types	Electronic genres	Scientific and workplace genres (preferably in digital support)
Textbooks Word lists Book adverts Catalogues Leaflets Indexes Academic essays Brief presentations Face-to-face interviews Group discussions …	Web pages OPACs Blogs Databases Thesauri Directories Electronic mail Desktop publishing genres Instructions …	Abstracts Monographs Research article sections Reviews Review articles Digests Circulars CFPs Memos Bulletins Annual reports Application letters and forms Grant proposals …

5.2 Information-related practices in *English for Library and Information Science*

The search for authentic and appropriate tasks obviously leads one to think of activities performed within the information management paradigm, i.e. information seeking, gathering, processing and use (in order to either simulate or adapt them). Students should also be skilled at exchanging information and at working as part of a team. User attention techniques could also be expected from them. Some authors suggest using the library as the classroom by taking LIS students there, as a way of fully exploiting information resources through simulations (Gracia Almendáriz 1997; Villaseñor-Rodríguez 1997). This includes not only the traditional library but, especially, the use of sources available on the Internet, bringing the Web into the classroom by making full use of the labs for these purposes. As a first information seeking step, and with Internet as work environment, LIS students can not only become skilled at using

the university library catalogue (OPAC) and at accessing the library stock, but can also benefit from access to unlimited information sources, learning how to select the most suitable and appropriate ones.

Some of the tasks and projects included in the curriculum, and which involve the use of CITs, are the following:

(1) One classroom project in the first year involves the use of printed and digital resources in the design of a leaflet, based on information from a previously selected website, as previously described (Fernández-Toledo 2002). Along the process, students preferably work in groups to carry out the following tasks:

- selection, from an English speaking context, of a website which introduces an information centre and its services (or part of them);
- selection of the main content from the website;
- deciding which information to include (or add if necessary) and what genre features will have to be changed for the adaptation of this information to the new genre (leaflet) and support (printed). This implies students' becoming aware of the different discourse constraints on language and of external features that genres carry with them;
- use of DTP techniques for production of the leaflet.

(2) A further related task consists of presenting the website that groups have been working with to the rest of class, in a session that takes place by the end of the semester. This way they have to work with the same digital information again, this time transforming it—summarising main points, distributing information among group members and clarifying key terms and meanings. The contents can be conveyed orally with the help of visual support (the website is displayed to the audience while students comment on its contents and particularities). This produces a very motivating task for students aiming at becoming information managers, as it implies comparing and evaluating LIS related webs that other colleagues have previously selected for varying reasons including personal motivations and affinity.

(3) Online subject searches have to be made as a previous step for an extensive reading assignment, and the reading matter chosen must be related to the career content, with variations depending on the year:

- First year students have to select either a book or a list of shorter readings on LIS contents, preferably of introductory nature, from the online library catalogue. This means choosing the right subject keywords to get what they want in English and the right level of specialisation (some practice on how to understand books' titles is carried out first). They are advised to read introductory textbooks at this stage. They are also asked to produce word lists or *glossaries* from the readings, making explicit the relevant linguistic and semantic information inferences made on the meanings of the selected terms in their immediate context.
- Second year students also have to do subject searches, this time selecting bibliography from a variety of formats and supports –i.e. they can select information on a given topic from journals, parts of books and websites. Then they are asked to summarise the information and evaluate its usefulness for a given audience/subject profile. They are also invited to share the information from their reading assignments in presentations that take place at the end of the semester, fostering the use of Power Point and similar applications as support.

● In the third year an experimental report simulation is carried out, which also involves selecting literature background as a first step, and going through the IMRAD writing process during the whole semester. Alongside this, different related research genres – such as research digests or reviews – are dealt with, and students have to make searches to find further samples from non-LIS disciplines in order to analyse them as an extension activity. In this way they become acquainted with the particularities of academic discourse communities belonging to different fields, and become aware of the degree of variation existing among them. This involves, for instance, using different genres – such as posters in Veterinary Surgery, or research notes in the "Bio" Sciences. They are also given the chance of presenting their small surveys at the end of the term, using *Power Point* or any other devices such as OHP, provided the rest of the class can easily follow the talk.

6 Conclusions

The tasks and projects described above pursue the recreation of either part or the whole of the information chain (information seeking, processing, use and dissemination) in the ELIS classroom. Discourse awareness and critical assessment and evaluation of information are also pervasive elements in them. Technology plays an important role, affecting discourse conventions as well as discourse perception and usage. Even the dynamics of group work are affected by the fact that both the medium and the object of study are, at least partly, digital. Thus, an electronic environment together with group based authentic tasks become key ingredients in a highly interdisciplinary curriculum design. This design aims at helping students become information literate as well as full members of the LIS academic and workplace discourse communities.

ELIS subjects are unique in the sense that they are intervening between different disciplinary arenas with different viewpoints and practices which sometimes present striking overlapping. In these cases, taking advantage of those coincidences and stressing on them for pedagogical purposes is of great benefit to.

So, in the present teaching of many sciences at undergraduate levels, Applied Linguistics genre theories and the concept of Academic Literacy are to be taken into account. An example of the spreading of genre theory to a field so distant from AL as Information Engineering is shown in Breure (2001), where the author advocates the application of this concept to areas such as Electronic Publishing or Content Engineering.

At the same time, the IL concept, having its roots in LIS and related fields, should be present as an objective to be accomplished in course designs in all fields and at all levels. After all, IL is highly related to AL and especially to ESP-EAP research, sharing some aspects which are also present in the European Education guidelines as goals to be attained in the new curricula (i.e., group work, digital socialization, focus on interaction at academic and workplace levels, students' engaging in specialised discourses or genre instances). Needless to say, IL also embraces the concept of Computer Literacy, whose proximity and importance is self-evident in the LIS environment. A recent example is the application of Salmon's digital socialization model to the virtual teaching of German as a foreign language, described in Ruipérez et al. (2006).

"Multiple literacy" arises as a key phrase to be linked to ELIS curriculum design (and, by extension, to most tertiary education ones). Two meanings of "multiple literacy" have been reviewed, though, and both are considered important. As posed by Bhatia (2001), the phrase refers to students' being able to recognise and work with different but related genres, belonging to the same colonies. The aim is increasing

students' language flexibility and genre awareness, so they can deal with new, arising genre types in long life learning. A further meaning is the one prevalent through this paper, i.e., being competent at the different literacies described – Computer, Academic and Information, and integrating them at least as nicely as Hunt (1994) suggests in the description of her literature seminars.

Lastly, in all fields (but particularly in the LIS one) there is a need to further explore the relationship between all these literacies, observing the interactions which take place in specific discourse communities –also called communities of practice, and how technology mediates them.

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